

Empirical essays on  
fiscal federalism and political  
economy in Germany

*Manuela Maria Krause*



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Empirical essays on  
fiscal federalism and political  
economy in Germany

*Manuela Maria Krause*

*Herausgeber der Reihe: Clemens Fuest*  
*Schriftleitung: Chang Woon Nam*

**ifo** INSTITUTE

Leibniz Institute for Economic Research  
at the University of Munich

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# Empirical essays on fiscal federalism and political economy in Germany

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**Manuela Maria Krause**

Referent: Prof. Dr. Niklas Potrafke

Korreferent: Prof. Dr. Thiess Büttner

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Namen der Berichterstatter: Prof. Dr. Niklas Potrafke  
Prof. Dr. Thiess Büttner  
Prof. Dr. Andreas Haufler

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# 1 Introduction

*“There can be no doubt,  
that if power is granted to a body of men,  
called representatives,  
they, like any other men, will use their power,  
not for the advantage of the community,  
but for their own advantage, if they can.”*

(James Mill)

In many countries, governments have been decentralized to improve the performance of the public sector. The main question to answer is how to align tasks and policy instruments among the different levels of government. This is the subject of fiscal federalism. Main contributions to this theory were made by Tiebout (1956), Musgrave (1959) or Oates (1972).<sup>1</sup> The idea is that decentralization can increase economic welfare. Decentralized governments can better cater heterogeneous interests than a centralized government. Oates (1972) emphasizes that for the efficient provision of public utilities, the services should be provided by the lowest possible level representing the area where citizens demand these services. Combined with the traditional model of revealed preferences by Tiebout (1956), a decentralized provision of public services can thus give rise to a pareto optimal provision of the services (Darby et al. 2003).

The idea of decentralization is typically realized by implementing a federal system, consisting of different levels of governments. Each level is responsible for individual tasks and has to provide specific public services. A federal system requires however also appropriate fiscal instruments for each level to fulfill these tasks (Oates 1999). Federal systems are thus typically characterized by fiscal autonomy for the different levels of governments. Fiscal autonomy includes deciding on expenditures, as already stated by Oates (1972), and also imposing taxes or using (to a limited extent) debt instruments. Autonomy can however induce externalities and disparities between subnational regions.<sup>2</sup> Many federations thus implemented intergovernmental grants or systems of equalization to reduce possible disparities (Buchanan 1950, 1952).<sup>3</sup> Equalization grants can however also provide incentives and – particularly in combination with tax autonomy – give rise to distortions (Oates 2005). Equalization grants may, for example, reduce efforts to generate own revenues. The exact institutional design of federal systems thus plays an important role.

---

<sup>1</sup> For an overview, see Oates (1999).

<sup>2</sup> Gordon (1983) shows that decentralized tax and expenditure policies can give rise to inefficiencies in the economic activity.

<sup>3</sup> For an introduction in the theory of equalization, see Boadway (2004).



## Introduction

The literature on fiscal federalism has been extended by several fields and disciplines over time.<sup>4</sup> One important strand relates to the field of public choice and political economy. The early contributions to the theory of fiscal federalism have assumed that politicians and public officials are benevolent and maximize social welfare (Oates 1972). The theory of public choice, by contrast, assumes that politicians have self-interests and act to maximize their own welfare (Downs 1957, Buchanan and Tullock 1962). Contributions to this literature thus investigate political processes and how political agents behave.<sup>5</sup>

One strand of the literature stresses the importance of elections. The political business cycle theories describe that politicians have an incentive to increase their reelection chances by pursuing expansionary policies before elections to influence the level of economic activity. The first contributions to this literature by Nordhaus (1975) and MacRae (1977) proposed theoretical models based on a Phillips curve tradeoff between inflation and unemployment. According to these models, politicians will inflate more during election years – by expansionary monetary and fiscal policies. These policies will give rise to a lower unemployment rate and thus to a favorable situation for the incumbent politicians. Although this theory received great attention, a shortcoming of these models was the assumption of adaptive voter expectations, *i.e.*, voters form their expectations based on what has happened in the past. Following contributions thus developed models of political business cycles under rational voter expectations (Rogoff and Sibert 1988, Rogoff 1990). Many studies have explored the theory of political business cycles empirically. Early contributions have focused on macroeconomic outcome variables such as unemployment and inflation. More recent studies have examined political business cycles in variables such as debt, expenditures or revenues of governments.

A second strand within the theory of public choice and an extension of the political business cycle theories points to the importance of parties and their ideologies for economic policy-making (Hibbs 1977). The partisan theories describe that politicians from different parties – mostly divided into left-wing and right-wing parties – will pursue different policies in line with the preferences of their constituencies. The theory is also based on the Phillips curve tradeoff described above. Left-wing voters are assumed to be blue-collar workers, while right-wing voters are mostly capital owners with higher income. Left-wing parties, who gratify the needs of their voters, will thus favor low unemployment rates and accept higher inflation rates. Right-wing parties will in contrast favor lower inflation rates while accepting higher unemployment rates. Left-wing parties thus pursue more expansionary policies than right-wing parties. The partisan approach was also extended by rational expectations (Chappell and

---

<sup>4</sup> Extensions to the literature on fiscal federalism by other fields and disciplines are often called “The second-generation theory of fiscal federalism”, see, *e.g.*, Oates (2005) or Weingast (2009).

<sup>5</sup> For a comprehensive introduction, see Mueller (2003).

Keech 1986, Alesina 1987). Many empirical studies have investigated whether government ideology influences economic policy-making.<sup>6</sup>

This thesis elaborates on selected incentives in fiscal federalism using the example of the federal system in Germany. As described above, depending on the exact implementation, fiscal federalism *per se* can provide fiscal incentives. In addition, combined with public choice theories, also political incentives are possible. The main part of this thesis examines political incentives within Germany's federalism, while the last two chapters also investigate fiscal incentives stemming from the exact design of federalism in Germany. The thesis takes a reform of the fiscal constitution in 2006 into account, which realigned legislative powers between the different levels of government. The reform aimed to decentralize financial responsibilities and to improve the efficiency within the federal system by granting the states some new rights.

The German federal system consists of three tiers: the federal level, the states and the municipalities.<sup>7</sup> All levels have different rights and duties but are also linked to each other for specific tasks. In Germany's federalism, the subsidiarity principle is implemented. The states and the municipalities have to fulfill a plethora of tasks. Both levels are in general also responsible for financing their tasks as the administrative and financial responsibility are linked according to the constitution (*Konnexitätsprinzip*). State and municipal governments have various revenue sources to finance their tasks. Tax revenues are the most important source for both levels. In specific cases, the federal or state governments also support the subnational governments in financing their tasks. Important are also the equalization schemes, which aim to equalize funds between the subnational levels. The degree of discretion, *i.e.*, the fiscal autonomy, of states and municipalities varies however over these resources.

Chapter 2 focuses on municipalities. The German municipalities have various revenue sources. The largest part consists of shared taxes, over which the municipalities have only limited influence. Municipalities may however set the tax rates of local taxes. The municipalities also receive equalization grants from the communal equalization schemes. The federal or state level also grants financial contributions for supplying certain public services. Another important source of municipalities' revenues are fees, which are levied for the effective use of a public service. Municipalities can decide independently of other governmental tiers on the fees of most public services. Municipalities thus have fiscal autonomy over fees.

Figure 1.1 shows the average development of tax revenues, financial grants and fees as a share of overall revenues for municipalities of the West German states in the time period from 1992 to 2015.<sup>8</sup> After tax revenues and grants, fees are the third most important revenue category

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<sup>6</sup> For a survey on OECD panel studies, see Potrafke (2017).

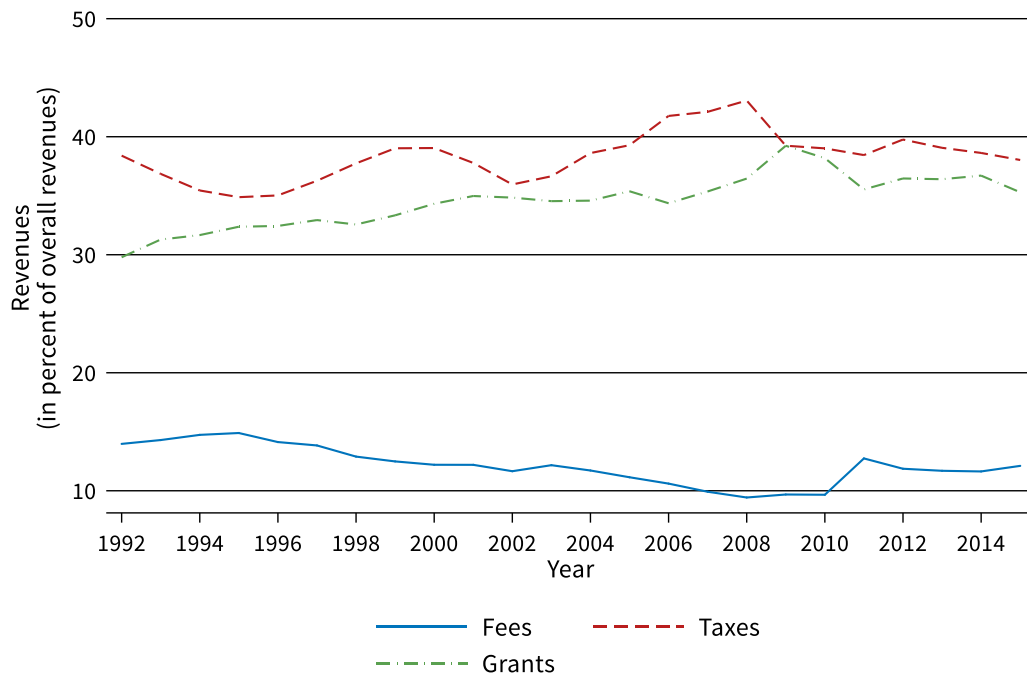
<sup>7</sup> An introduction in the federal system in Germany is provided by Blankart (2011) and Brümmerhoff and Büttner (2015).

<sup>8</sup> The sample includes municipalities from Baden-Wuerttemberg, Bavaria, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland and Schleswig-Holstein. The city states Hamburg and Bremen are excluded.

## Introduction

for the municipalities. The share of revenues from fees accounts on average for 12 percent of overall revenues. The share has declined over time with a short-time increase in 2011. In 2015, fees accounted again for 12 percent of overall municipal revenues.

**Figure 1.1: Municipal revenues by different sources, 1992–2015**



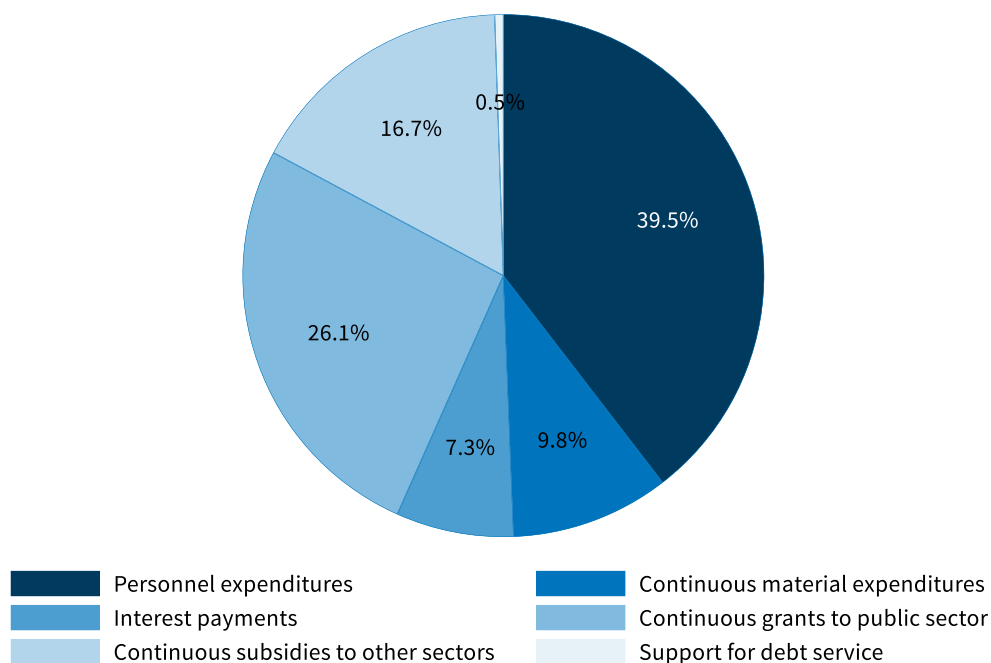
Source: Statistisches Bundesamt (different years); own illustration.

Communal fees are thus an important revenue source for German municipalities. Fees should be equivalent to the (expected) costs of public services and thus represent the benefit principle in public finance. The local councils of municipalities, which are by law responsible for setting fees, have however a leeway to determine fees. In Chapter 2, I examine this leeway by elaborating whether electoral cycles, based on the political business cycle theories by Nordhaus (1975) and Rogoff (1990), occur in communal fees of German municipalities. I use revenue data for around 7,000 West German municipalities from seven states over the period 1992–2006. The results show that municipalities increase communal fees less in election years than in the middle of the legislative period, while they increase fees more directly after elections. Fees increase in election years by 0.94 euro per capita less than in the middle of the legislative period. Fees increase however directly after an election by about 1.74 euro per capita more than in the middle of the legislative period. This behavior is consistent with the predictions of the political business cycle theories.

The following chapters of this thesis focus on the state level in Germany. The states also have to fulfill important tasks. The link between the administrative and financial responsibility provides the states in general with the possibility to decide on their expenditures. The degree of

discretion varies however between different expenditure categories (e.g., Seitz 2008). A large part of the expenditures consists of personnel expenditures. Figure 1.2 shows for the year 2011 the states' expenditures for different types of public expenditure as a share of overall current expenditures. Personnel expenditures account for the largest share. Nearly 40 percent of all current expenditures are for personnel costs. An interesting subcategory of the personnel expenditures are expenditures for members of parliament (MP) and for civil servants. Since a decision of the Supreme Court in 1975, the German states have a leeway to decide on MP salaries. Salary adjustments of MPs however often cause disenchantment of voters with politics. The given leeway may thus provide incentives for politicians, who aim to reward their constituencies. In line with the political business cycle theories, politicians may reschedule salary increases of their own salaries because of elections.

**Figure 1.2: States' expenditures by type of expenditure, 2011**



Note: Expenditures are calculated as the shares of overall expenditures according to current accounts.

Source: Statistisches Bundesamt (2011); own illustration.

In Chapter 3, which is joint work with Björn Kauder and Niklas Potrafke (based on Kauder et al. 2018), we investigate electoral cycles in salary increases of German state MPs. We use data for 15 states over the period from 1980 to 2014. The results do not show that elections influence increases in MP salaries. Politicians can increase MPs' salaries at any point in time without suffering from negative consequences.

## Introduction

Politicians may however not only influence policies because of reelection concerns. As described above, government ideology may also predict economic policy-making. For the German states, many studies provide evidence that government ideology influences individual policy fields.<sup>9</sup> In some policy fields, however, the states have no discretion to decide independently on the policies. A reform of the German fiscal constitution in 2006 restructured legislative powers between the federal and the state governments. Among other changes, the reform allowed the states to design discretionarily the salaries of their civil servants. Before the reform, the federal level held the decision power on the salaries of all civil servants in all states. Civil servants reflect a large share in the public sector in Germany and include different professions, for example servants in the administration, professors or judges. Their salaries differ considerably. Salaries of civil servants may thus serve as a proxy for the income distribution within the public sector. Government ideology has been shown to influence redistribution of income (e.g., Scheve and Stavasage 2009). Left-wing governments redistribute income from high-income citizens to low-income citizens, thus reducing income inequality. Right-wing governments are not expected to redistribute as much as left-wing governments. The given leeway in deciding on salaries of civil servants may also give state governments, influenced by their ideology, the opportunity to redistribute income between different groups of civil servants.

In Chapter 4, which is again joint work with Björn Kauder and Niklas Potrafke, we investigate whether government ideology influences redistribution of income within the public sector of the German states. We use data on salaries of civil servants in the states since 2007. The hypothesis to be tested is that left-wing governments redistribute income from high-income civil servants to low-income civil servants, thus reducing income inequality within the public sector more than right-wing governments. We use five income inequality measures comparing salaries across pay levels and operating experiences of different groups of civil servants. The results do not show that left-wing governments were more active in decreasing income inequality among civil servants than center or right-wing governments.

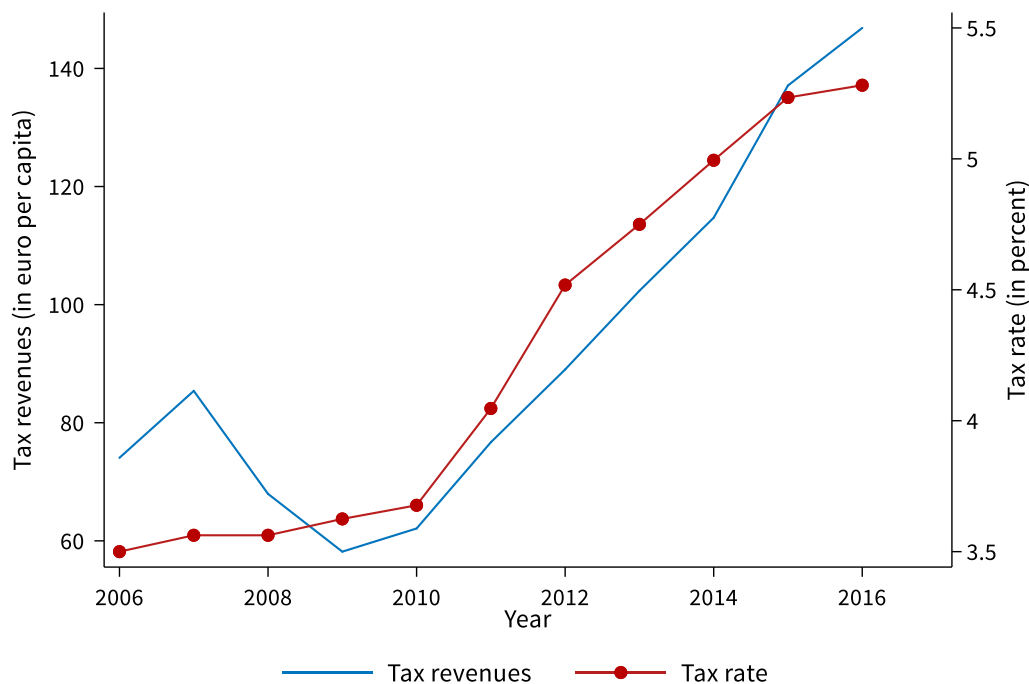
Another key element of the federal reform in 2006 was the devolution of tax setting powers to the states. Before the reform, the states had for a long time no discretion over own tax instruments. The states have in general various revenue sources, but the degree of discretion, *i.e.*, their fiscal autonomy, varies over the sources. The main part of states' revenues consists of shared taxes, over which individual states have no discretion to influence the tax rates. Besides shared taxes, the states also obtain revenues from state taxes, whose amounts are exclusively for the states. The most important state taxes – in revenue terms – are the real-estate transfer tax and the inheritance tax. The reform in 2006 allowed the states to set the tax rates of the real-estate transfer tax. The states thus received after a long time again tax autonomy for an individual tax. After the reform in 2006, many states began to increase their tax rates.

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<sup>9</sup> For an overview, see Section 4.2.2.

No state lowered its tax rate. Figure 1.3 shows the average development in tax rates and in tax revenues (in per-capita terms) among all 16 states since 2006. The averages of tax rates and revenues have increased considerably over time. Before the reform, the tax rate was fixed at a level of 3.5 percent for all states. In 2016, the mean tax rate reached a level of 5.3 percent. Per-capita revenues from the real-estate transfer tax have also increased considerably over time.

**Figure 1.3: Average tax rate and tax revenues of the real-estate transfer tax, 2006–2016**



Note: Average of real-estate transfer tax rates among the 16 states and average of revenues from the real-estate transfer tax in per-capita terms.

Source: State announcements and Federal Ministry of Finance; own illustration.

The real-estate transfer tax has to be paid on the sale price of the real estate determined in a contract between the selling and the purchasing party. Although tax rates do not seem to be very high, the amount to be paid by the buyer of a real estate is usually quite high because of the sizeable tax base. Among all transaction costs, which have to be paid for purchasing real estate, the real-estate transfer tax accounts in Germany for more than 50 percent (Andrews et al. 2011).<sup>10</sup> The tax is thus not neglectable for citizens.

In Chapter 5, which is joint work with Niklas Potrafke (based on Krause and Potrafke 2017), we investigate whether government ideology predicts tax rates of the real-estate transfer tax.

<sup>10</sup> Transaction costs include in general real-estate transfer taxes, notary and legal fees, registration fees and real-estate agent fees (Andrews et al. 2011).

## Introduction

Since the real-estate transfer tax is likely to influence high-income citizens, who often own property, right-wing and left-wing governments may well differ in their tax policy because of diverging interests of their constituencies. We investigate increases in the tax rates of all 16 German states for the period from 2007 to 2017. Our descriptive results show that left-wing and center governments were more active in increasing the tax rates of the real-estate transfer tax than right-wing governments. The results of the empirical analysis show that – conditional on other explanatory variables – the real-estate transfer tax rate is 0.52 percentage points higher under left-wing than under right-wing governments. The results thus indicate that political parties, when given the opportunity, are prepared to offer polarized tax policies.

Besides revenues from taxes, the fiscal equalization scheme is another important revenue source for the German states. The German fiscal equalization scheme aims at equalizing funds available for the states to ensure equal conditions in every state. The equalization scheme consists of different horizontal and vertical stages, which redistribute revenues among the federal and state level and between the states. The devolution of tax setting powers to the states with the federal reform in 2006 provides an interesting set-up to investigate. The combination of tax autonomy and fiscal equalization may provide distortions (Oates 2005). Equalization schemes may, for example, provide fiscal incentives to reduce own tax efforts (Musgrave 1959).

In Chapters 6 and 7, which are both joint work with Thiess Buettner (Chapter 6 is based on Buettner and Krause 2018), we thus investigate whether also the German fiscal equalization scheme influences the states' real-estate transfer tax policy. In the German case, the revenues of the real-estate transfer tax are used within the equalization system. We use a simulation model of the fiscal equalization scheme to calculate the degree of redistribution of tax revenues from real-estate transfer taxes within the equalization scheme. We use data for the period from 2006 to 2016 in Chapter 6 and from 2006 to 2017 in Chapter 7. The descriptive results in Chapter 6 and the empirical analysis in Chapter 7 show that the substantial redistribution of revenues from the real-estate transfer tax within fiscal equalization provides significant incentives for the states to raise their tax rates. With full equalization, a state is predicted to set the tax rate of the real-estate transfer tax about 1.3 percentage points higher than without. The results show further that the incentive effect to raise the tax rate is even proliferated by the equalization scheme. Equalization thus substantially influences tax policies of the states.

In this thesis, I thus examine several political and fiscal incentives within Germany's federal system providing new and interesting results. Some of the results may be relevant for policy-makers or for upcoming debates about the federal system in Germany.

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## 2 Communal fees and election cycles: Evidence from German municipalities

### Abstract

The political business cycle theories describe that election-motivated politicians manipulate economic policy-making. Election cycles occur in many fiscal variables, for example tax rates. I examine whether electoral motives influence communal fees in Germany. Fees have to be paid for the use of many public services, for example waste management or sewerage provisions. Fees should be equivalent to the costs of a public service and thus correspond to the benefit principle in public finance. The German municipalities, however, have a leeway to determine fees. I use revenue data for around 7,000 West German municipalities from seven states over the period 1992–2006. The results show that municipalities increase communal fees in election years to a smaller extent than in the middle of the legislative period, while they increase fees more directly after elections. Fees increase in election years by 0.94 euro per capita less and directly after elections by 1.74 euro per capita more than in the middle of the legislative period. The results thus corroborate the predictions of the political business cycle theories.

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### 2.1 Introduction

The political business cycle theories describe that politicians would like to increase their reelection chances by pursuing expansionary policies before elections (Nordhaus 1975). The early literature has focused on macroeconomic outcome variables such as unemployment and inflation to investigate election cycles. More recent studies have examined political business cycles in variables such as public debt, expenditures or revenues of governments. Evidence on election cycles is however mixed (see, for example, Alesina and Roubini 1992 or de Haan and Klomp 2013).

Most studies examining election cycles in revenues focus on taxes. I investigate whether election cycles occur in (communal) fees. Investigating effects of political economic variables on fees is innovative. In public finance, fees are a prime example for the benefit principle (Wicksell 1896, Lindahl 1919). The benefit principle describes that people have to pay for public services they receive from the government, directly to the extent they use these services. Fees should thus amount to the cost of a public service, which constraints leviathan governments.<sup>1</sup>

In many countries, local jurisdictions charge fees for public services. I focus on German municipalities, which provide public services, such as waste management, sewerage provisions or child care. According to the principles to generate revenues, municipalities should first acquire revenues from fees or other duties than from taxes. Fees are thus an important source of revenue for municipalities. In German municipalities, fees accounted on average for 12 percent of overall revenues of the municipalities in 2015.<sup>2</sup> For most fees, municipalities can decide discretionarily and independently of other governmental tiers on the level of fees.<sup>3</sup> Municipalities have leeway because they can decide which costs they take into account to calculate fees.

As fees are levied for many public services, nearly every citizen in a municipality has to pay fees. Citizens may thus be more sensitive towards changes in fees than for example towards changes in local business tax rates. Note that fees are, in contrast to taxes, regressive. With election cycles in fees politicians are likely to manipulate low-income voters more than with election cycles in taxes. Every citizen receives on an annual base a notification of the amount of fees he or she has to pay for a specific public service. Citizens are thus informed about

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<sup>1</sup> In contrast to that, the ability-to-pay principle describes that public burdens should be allocated according to the individual abilities to pay. The ability-to-pay principle hence aims to ensure horizontal and vertical equity. Many tax systems are implemented according to the ability-to-pay principle.

<sup>2</sup> Statistisches Bundesamt (2015).

<sup>3</sup> Fees thus represent also a key characteristic of federal public finance as they ensure in a broader sense the fiscal autonomy of local governments (Zimmermann 2009).

changes in fees. Anecdotal evidence also shows that fees are discussed controversially in the public. Especially increases in fees cause indignation.<sup>4</sup>

Studies provide evidence that fees for the usage of the same public service differ considerably between municipalities. Some differences are due to geographical and structural constraints. A substantial part of the differences, however, cannot be explained (IW Cologne 2017). Fees differ both between municipalities and within municipalities over time. To some extent, differences over time can be explained by increased or decreased costs for providing public services. It is also conceivable that municipalities are under fiscal stress because expenditures are growing in general and thus try to increase their revenues by increasing fees.

I examine whether election cycles occur in communal fees of German municipalities. I add to the literature on election cycles at the local level. In Germany, only a few studies have so far shown electoral cycles in fiscal variables at the local level (Foremny and Riedel 2014, Furdas et al. 2015, Englmaier et al. 2017, Garmann 2017, Foremny et al. 2018). Municipalities have discretionary power to decide on their fees. I compiled a panel data set of around 7,000 West German municipalities from seven states for the period 1992–2006. The results show that municipalities increase communal fees in election years to a smaller extent than in the middle of the legislative period. Municipalities increase fees more after elections. My results corroborate the predictions of the political business cycle theories.

## 2.2 Related literature

The political business cycle theories describe that incumbent politicians – motivated by re-election concerns – pursue expansionary policies before elections to influence in the short run the level of economic activity. Election-motivated politicians may, for example, increase public expenditures or decrease taxes. The first contributions to this literature by Nordhaus (1975) and MacRae (1977) proposed theoretical models based on a Phillips curve tradeoff between inflation and unemployment.<sup>5</sup> Other studies extended these models with rational voter expectations (Rogoff and Sibert 1988, Rogoff 1990). A plethora of empirical literature has explored the theory of political business cycles. While early contributions have focused on macroeconomic outcome variables such as unemployment or inflation (see Alesina et al. 1997 for an overview), more recent studies have examined political business cycles in variables such as debt, expenditures or revenues of governments (e.g., Schuknecht 2000, Brender and Drazen

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<sup>4</sup> Articles in regional newspapers often inform in detail about changes in fees and how people complain about increases (e.g., *Badische Zeitung*, see <http://www.badische-zeitung.de/schwanau/hoehere-gebuehren-fuers-abwasser-x1x--148792684.html>; *Sächsische Zeitung*, see <https://www.sz-online.de/nachrichten/widerstand-gegen-gebuehrenerhoehung-3861094.html>).

<sup>5</sup> Other important early contributions on election cycles were made by Lindbeck (1976) and Tufte (1978). Another strand of literature focuses on partisan cycles (Hibbs 1977, Alesina 1987) by describing electoral cycles with shifts in political ideology. For a survey on partisan politics in OECD panel studies, see Potrafke (2017).

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2005, Katsimi and Sarantides 2012).<sup>6</sup> The literature has mainly examined election cycles at the federal or the state level, mostly focusing on fiscal variables.<sup>7</sup> Only more recently, the literature on political business cycles also focused on the municipal level. Studies investigate mostly election cycles in expenditures by focusing on specific categories (Baleiras and da Silva Costa 2004, Foucault et al. 2008, Aidt et al. 2011, Cioffi et al. 2012, Sjahrir et al. 2013). Another strand of literature focuses also on the composition of expenditures (e.g., Akhmedov and Zhuravskaya 2004, Drazen and Eslava 2010). Some studies investigate election cycles in revenues of local governments by focusing especially on taxes (Kneebone and McKenzie 2001, Binet and Pentecôte 2004, Ashworth et al. 2006, Veiga and Veiga 2007, Benito et al. 2013).<sup>8</sup> There is quite some evidence for election cycles at the local level in Germany. For the local business tax in West German municipalities, it is shown that the growth in tax rates is reduced significantly in election and pre-election years but increased after local elections (Foremny and Riedel 2014). For 604 large West German municipalities, revenues and expenditures are shown to decrease before local elections, while building investments and intergovernmental grants for investment purposes increase (Furdas et al. 2015). Another study provides evidence that electricity prices, which can be influenced by municipality-level politicians, are systematically decreased before elections compared to prices of privatized providers (Englmaier et al. 2017).<sup>9</sup> For municipalities in the German state Hesse, the number of building licenses has been shown to increase significantly in election years (Garmann 2017). For municipalities of two West German states, Bavaria and Baden-Wuerttemberg, election effects are shown in municipal expenditures both before elections in the legislative (local council) and before executive (local mayor) elections (Foremny et al. 2018).

The study most closely related to mine is the study of Foremny and Riedel (2014), who investigate electoral cycles in taxes (ability-to-pay principle). I focus on fees as a prime example for the benefit principle in public finance. Politicians are likely to decrease fees before elections and to postpone increases in fees until after elections.

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<sup>6</sup> For evidence for a broader set of countries, see, for example, Persson and Tabellini (2003), Shi and Svensson (2006), and Potrafke (2012a).

<sup>7</sup> On empirical studies for Germany at the federal level, see, e.g., Matschke (2003), Berger and Woitek (1997) or Potrafke (2012b). On election cycles at the state level in Germany, see, e.g., Galli and Rossi (2002), Tepe and Vanhuyse (2009, 2013, 2014), Schneider (2010), Mechtel and Potrafke (2013) or Kauder et al. (2017). No evidence on election cycles, however, was found in increases in salaries of German state Members of Parliament (Kauder et al. 2018) – see Chapter 3.

<sup>8</sup> Electoral incentives also depend on term limits; see, for example, Klein and Sakurai (2015) or Dalle Nogare and Kauder (2017).

<sup>9</sup> Some studies investigate the determinants of contracting-out public services and point to the importance of ideological or political motives, e.g., Picazo-Tadeo et al. (2012) or Petersen et al. (2015).

## 2.3 Institutional backdrop

### 2.3.1 German municipalities

The federal system in Germany consists of three governmental tiers: the federal level, the (16) states, and the (around 11,000) municipalities. The German constitution guarantees the municipalities the right to regulate their affairs on their own responsibility (Article 28 German constitution (*Grundgesetz*)). In some areas, however, federal and state laws limit the right of local self-government.<sup>10</sup>

Municipal tasks can be divided into three categories: voluntary tasks (*freiwillige Selbstverwaltungsaufgaben*), own compulsory tasks (*pflichtige Selbstverwaltungsaufgaben*), and transferred compulsory tasks (*übertragene Selbstverwaltungsaufgaben*).<sup>11</sup> The municipalities' degree of discretion varies over these tasks. Transferred and own compulsory tasks include tasks that were assigned to the municipalities by the federal and state governments. In the case of transferred compulsory tasks, municipalities have to fulfill the tasks and can also not decide discretionarily on how to fulfill them. This holds especially true for basic administration tasks, which are mostly identical across all states. Own compulsory tasks can, by contrast, vary over states and municipalities. To be sure, municipalities have to fulfill these tasks, but they have discretion about how to fulfill them (tasks including child care, school building or waste management). For most of these own compulsory tasks, minimum standards of quality are required. Municipalities are however free to expand these minimum standards of quality. Voluntary tasks of municipalities include, for example, the promotion of culture or sport facilities. Municipalities can decide independently on whether to fulfill these tasks or not.

The right of self-government of the German municipalities includes also their fiscal autonomy. The municipalities are in general responsible for financing their tasks because the administrative and financial responsibility are linked according to the constitution. To finance their tasks, municipalities have various revenue sources. A large part of municipal revenues consists of revenues from shared taxes including the income tax and the value added tax (VAT). These taxes are shared among the federal, the state and the municipality level. The municipalities have no discretion over the corresponding tax rates. In addition, municipalities levy own local taxes. The German municipalities decide on the tax multipliers (*Hebesätze*) of three tax instruments: the local business tax (*Gewerbesteuer*) and two local property taxes A and B (*Grundsteuer*). To fulfill their responsibilities, municipalities also receive financial contributions from the federal or state level for supplying certain public services, for example for the

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<sup>10</sup> For a detailed introduction into the institutional details, see Zimmermann (2009). For a short introduction, see Blesse and Baskaran (2016).

<sup>11</sup> At the local level, responsibilities for different tasks are sometimes divided between counties (*Landkreise*) and independent cities (*kreisfreie Städte*), districts (*Regierungsbezirke*) and the municipalities itself.

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improvement of school buildings, local public transport or for specific social services. Equalization grants – mainly financed through state revenues – are another source of income. The grants help to equalize funds available for the municipalities and to finance public services.<sup>12</sup> Another important source for the municipalities are revenues from duties and especially fees.

There are two types of fees: administrative fees and utilization fees. Administrative fees include, for example, fees for issuing a passport. Utilization fees are levied for the effective use of a public service, for example waste disposal. For some fees, especially for administrative fees, municipalities are limited by federal or state law. Municipalities can, however, decide autonomously on fees for most public services. Fees are thus part of municipalities' fiscal autonomy. Fees are set for at least one year and have to be equivalent to the (expected) costs of a public service, which corresponds to the benefit principle in public finance. State-specific laws for local rates (*Kommunalabgabengesetze*) describe this so-called cost-covering principle (*Kostendeckungsprinzip*), which holds for all municipalities. These laws define the general calculation base – especially which (expected) costs have to be taken into account to calculate the fees. The municipalities can nevertheless decide discretionarily which costs they take into account and thus have a leeway to calculate the fees.<sup>13</sup> For the most important fees, citizens receive yearly a notification describing the amount to pay. Voters are thus aware of changes in fees.

### 2.3.2 Municipal elections

Elections at the municipal level are typically held every five years. An exception is Bavaria, where elections are held every six years.<sup>14</sup> Important for the empirical analysis is that election dates are regulated by state law and are thus outside the control of individual municipalities. Municipal election dates are the same within a state but differ across states. I thus disentangle election effects from common time trends.

At local elections, the local council is elected. The local council represents the municipality. Major tasks include the local legislation<sup>15</sup> and the supervision of the administration. Municipalities also have a mayor, who is sometimes elected at a separate election. The administrative discretion between the mayor and the council varies between the states. In all states, the

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<sup>12</sup> Equalization grants include in general unconditional formula-based grants, conditional grants, general levies and other grants.

<sup>13</sup> An indicator for differences in fees within and between municipalities are also the diverse cost-covering grades for specific public services of municipalities, see, e.g., Brümmerhoff und Büttner (2015), p. 623.

<sup>14</sup> Further exceptions include Bremen and Hamburg, where elections are held every four years. I do, however, not include these city states in my sample.

<sup>15</sup> In a legal sense, municipalities are not part of the legislative body as laws can only be enacted by the federal or state governments in Germany. Municipalities can nevertheless issue statutes, for example to determine fees.

local councils are by law responsible for preparing the local budget, which also includes setting (the exact rates for) fees.<sup>16</sup> In most municipalities, the local councils are elected according to the (personalized) proportional representation system, where voters vote on open or closed party lists.<sup>17</sup>

## 2.4 Data and methodology

### 2.4.1 Data sources

I employ data from German municipalities for the period from 1992 to 2006.<sup>18</sup> The data set includes municipalities of seven West German states. I exclude the city states of Hamburg and Bremen because state and municipality budgets are not easily separable within these states and also the state of Schleswig-Holstein because of data availability. I do also not include municipalities in East German states because most of those municipalities were subject to mergers and local government reforms in the time period I consider. I exclude also West German municipalities that were subject to a merger. The sample covers over 7,000 municipalities in Germany. I use data on revenues from utilization fees from the annual budgetary statistics (*Jahresrechnungstatistiken*). Data on fees can be differentiated between administrative and utilization fees and between the different tasks of the municipalities. It is thus possible to consider different outcome variables. Data on local elections and the results of the elections are obtained from the state election offices (*Landeswahlleiter*) and the statistical offices of each state. Information on the population, the population structure and further fiscal variables are also obtained from the statistical offices of the states.

Table 2.1 shows descriptive statistics for the main variables. Table 2.2 shows correlations between the dependent variable and the main explanatory variables: first differences in fees per capita and the election variables are significantly but only weakly correlated. The correlation between the first differences in fees per capita and the election year dummy variable is negative. The correlations between first differences in fees per capita and the pre- and post-election year variables are positive. Table 2.3 shows the election dates in the municipalities of the seven West German states between 1992 and 2006.<sup>19</sup>

Figure 2.1 shows the development of average per-capita fees in all municipalities over the period from 1992 to 2006. The development does not show any clear trend over time. Per-capita

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<sup>16</sup> Mayors have veto power if they consider calculations of fees not to be in line with the law. Mayors, however, hardly ever use their veto power.

<sup>17</sup> Some small municipalities vote according to the plurality voting system, where voters vote on individual candidates rather than on party lists. For those municipalities, it is thus not possible to calculate the vote and seat shares for individual parties.

<sup>18</sup> Using more recent years than 2006 is not feasible, because comparable data is not available for all municipalities as the budgetary accounting of the municipalities has been reformed since 2006.

<sup>19</sup> Note that I also include election dates of the years 1991 and 2007 to account for the fact that the first and last year of my sample period could be pre- or post-election years.



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fees fluctuate between 75 and 85 euro with a slight overall decrease since 1998. Figure 2.2 shows the average change in per-capita fees for different years within the legislative period. Per-capita fees increase on average by 0.49 euro in the year before an election, but decrease by 0.35 euro per capita in election years. In post-election years, per-capita fees increase on average by 0.42 euro and in other years of the legislative period by 0.14 euro per capita. Per-capita fees thus seem to decrease especially in election years.

### 2.4.2 Empirical strategy

The baseline panel-data model has the following form:

$$\begin{aligned} \Delta Fees_{i,t} = & \beta Election\text{-}year_{i,t} + \gamma Pre\text{-}election\text{ year}_{i,t} + \delta Post\text{-}election\text{ year}_{i,t} \\ & + \varepsilon X_{i,t} + \eta_i + \tau_t + U_{i,t} \\ & \text{with } i = 1, \dots, 7235; t = 1, \dots, 15 \end{aligned}$$

where  $\Delta Fees_{i,t}$  measures the first difference of (positive) revenues from local fees per capita in municipality  $i$  in year  $t$ . The data are deflated by using the national consumer price index; negative revenues are excluded. I use fees in per-capita terms to make the data comparable between municipalities. I apply first differences to ensure a stationary time series. In my first specifications, I use the sum of utilization fees of all categories as the dependent variable. In alternative specifications, I also use task-specific revenues from fees. To capture election cycles, the dummy variable *Election year* $_{i,t}$  assumes the value 1 if a local election takes place in municipality  $i$  in year  $t$  and 0 otherwise. The variables *Pre-election year* $_{i,t}$  and *Post-election year* $_{i,t}$  take on the value 1 for the year before and the year after a local election in municipality  $i$  and 0 otherwise. Concerns about potential endogeneity of the election variables include reverse causality and omitted variable bias. The election variables are not prone to reverse causality because the states decide on the dates for municipal elections. Individual municipalities thus cannot influence the timing of elections. To limit the risk of omitted variable bias, I include a set of control variables ( $X_{i,t}$ ) that are likely to be correlated with revenues from fees and/or the election variables.

I control for economic and socio-economic characteristics of the municipalities. I include the first difference of the total number of inhabitants of a municipality (in 1,000) to control for the growth of a municipality. To capture the demographic structure of a municipality, I include the first difference of the share of inhabitants below the age of 15 and the first difference of the share of inhabitants above the age of 65.<sup>20</sup> To control for the economic situation of a municipality, I include the first difference of per-capita debt of each municipality.<sup>21</sup> I include all

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<sup>20</sup> In Rhineland-Palatinate, I use the age of 20 and the age of 60 because of data availability.

<sup>21</sup> Debt includes credit market debt and debt on the public level. In Lower Saxony, data on debt were only available at the level of municipal unions. I therefore assume that each municipality in such a union is indebted according to its population share in the entire union. Data on debt in Baden-Wurttemberg were available only from 1998 onwards, in North Rhine-Westphalia from 1995 onwards.

these control variables with a lag of one because data on these variables are typically available with a delay of one year. I also include the tax rates of the two most important local taxes (Property tax B and Business tax). I do not use lags here because municipalities can decide discretionarily on the tax rates.

To control for the political ideology of the local council, I use the vote shares of the most important political parties in Germany. The four main parties include the right-wing CDU/CSU<sup>22</sup>, the left-wing SPD, and the much smaller FDP and Greens. I aggregate the votes of the other remaining parties, which mainly represent local parties, into a further category (Others).<sup>23</sup>  $\eta_i$  describes a fixed municipality effect;  $\tau_t$  is a fixed time effect;  $u_{i,t}$  is the error term.

I estimate the model with robust standard errors clustered on the municipality level (Huber/White/sandwich standard errors; see Huber 1967, White 1980).

## 2.5 Regression results

### 2.5.1 Baseline results

Table 2.4 provides regression results for the sum of utilization fees per capita. The first specification only includes the election dummies and does not include fixed time effects. The results show that in the pre- and the post-election years fees per capita increase more than in other years of the legislative period. Both coefficients are positive and significant at the 1 percent level. The coefficient for the election year dummy variable is negative but does not turn out to be statistically significant. In Column (2), I include fixed time effects. The post- and pre-election year dummy variables still show positive and significant coefficients. The coefficient for the election year variable is negative and statistically significant at the 1 percent level. The specification in Column (3) includes controls for socio-demographic and economic characteristics of the municipalities. The sample size declines with these controls added, because data on debt for municipalities in Baden-Wuerttemberg and North Rhine-Westphalia were only available for a shorter time period. Focusing on the election cycle dummies, inferences do not change. In Column (4), I include also political control variables. The results corroborate that the pre- and post-election year coefficients are positive and statistically significant. The coefficient of the election year dummy variable is negative and statistically significant at the 1 percent level. This indicates that conditional on the other control variables fees per capita increase less (or decrease more) in election years compared to other periods in the middle of the legislative period. Fees increase in election years by 0.94 euro per capita less than in the

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<sup>22</sup> In Bavaria, the conservatives are represented by a sister party of the CDU, the Christian-Social Union (CSU).

<sup>23</sup> In some small municipalities members of the local council are elected according to a plurality voting system. For these municipalities, official data do not include individual party vote and seat shares. I thus code vote and seat shares for individual parties as zero. In some states, local voters' associations or common nominations from different parties are also possible. I consider votes and seats for these associations as belonging to *other* political parties.

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middle of the legislative period. In contrast to that, fees increase more directly after an election – by about 1.74 euro per capita more than in the middle of the legislative period. This means that fees increase by about 8 percent of a standard deviation more in post-election years than in the middle of the legislative period. Local councils thus increase fees most when the time gap to the next election is maximized. Interestingly, the coefficient for the pre-election year variable is also positive and statistically significant at the 1 percent level. Two explanations come to mind. As the exact election dates vary between March and September within a year, a pre-election year dummy might include two up to 21 months before an election. It thus might capture also months essentially in the middle of the legislative period, where local councils increase fees rather than to decrease them. The average election date in my sample lies in the mid of June and thus supports this hypothesis partially. An alternative explanation could be that local councils increase fees in the pre-election period to decrease them even more in the election year.

Focusing on the set of control variables, five variables are statistically significant. Fees per capita increase when the share of people under 15 years increases. When the share of young people under 15 years increases by one percentage point, fees increase on average by additional 0.20 euro per capita. This might be because younger people demand more public services that are paid by fees. Fees per capita also increase when per-capita debt increases. This is intuitive since local municipalities use increases in different revenue sources when they are indebted. The coefficient is however rather small. Fees per capita increase less when the vote share of the FDP increases at the expense of the SPD. The same result holds for the vote shares of the Greens and the other remaining parties. All coefficients are negative and statistically significant at the 10 or 5 percent level. When the vote share of the FDP increases by one percentage point at the expense of the SPD vote share, per-capita fees increase by 0.10 euro less. The effect for the Greens is of similar size. I conjecture that the FDP as a market-oriented party prefers a small size of government. The Greens, by contrast, may prefer financing public services using taxes (ability-to-pay principle) rather than fees (benefit principle). The coefficient for the vote share of the CDU is also negative but lacks statistical significance at conventional levels.

I also run the regressions for task-specific revenues from fees. I include the most important categories, *i.e.*, those categories with the highest average amount of fees per capita. I constrained the results to those categories with a sufficient amount of observations to guarantee that the categories are important for the majority of municipalities. I consider fees from sewerage provision, waste management and child care facilities. These tasks belong to the own compulsory tasks. Municipalities have to fulfill the tasks, but can decide discretionarily on how to fulfill them. These tasks are thus especially suitable for the analysis of election cycles. I only include those municipalities that received revenues from fees for the respective category for the entire time period that I consider. The sample size is thus reduced compared to the previous estimations. Table 2.5 shows the results for the estimations including all control

variables and fixed time effects. Column (1) presents the results for fees from waste management. The results show that per-capita fees from waste management increase less in election years than in years in the middle of the legislative period. The coefficient is negative and statistically significant at the 1 percent level. Fees increase by about 0.56 euro per capita less in election years than in years in the middle of the legislative period. Per-capita fees from waste management decrease also when the population increases – indicating economies of scale – and when per-capita debt increases. Per-capita fees increase less when the vote share of the FDP increases (at the expense of the SPD). Focusing on fees from sewerage provision, the results show again that per-capita fees increase less in election years, but increase more in the year after an election compared to the middle of the legislative period. Both coefficients are significant at the 1 percent level. Fees increase by about 1.28 euro per capita less in election years than in the middle of the legislative period. Focusing on the control variables, per-capita fees from sewerage provision increase when per-capita debt increases, but increase less when the vote shares of the CDU or other parties increase at the expense of the SPD vote share. As the last subcategory, I also consider per-capita revenues from fees from child care facilities. Within this category, per-capita fees increase more before and after elections. The coefficient of the post-election year variable is positive and statistically significant at the 1 percent level, while the coefficient of the pre-election variable is positive and statistically significant at the 10 percent level. The coefficient for the election year variable is negative but lacks statistical significance. Per-capita fees from child care facilities increase when the population, the share of young inhabitants or the property tax rate increases. By contrast, per-capita fees increase less when the vote share of the Greens increases at the expense of the SPD. The results from the sub-categories thus confirm the results for the sum of per-capita revenues from fees.

### 2.5.2 Robustness tests

I run several robustness tests. None of these tests shows any severe fragility of my results focusing on the sum of fees.

As a first robustness test, I estimate a dynamic version of my baseline model. The dependent variable in my model is likely to be endogenous. In a dynamic panel data model with a relatively short observation period as in this case ( $t = 15$ ), the common fixed effects estimator might be biased. I therefore use the generalized method of moments (GMM) estimator developed by Arellano and Bond (1991). I estimate the model using the system GMM approach developed by Arellano and Bover (1995) and Blundell and Bond (1998), which is preferred in case of a persistent endogenous variable and for “small T, large N” panels. Since fees are likely to be persistent, I apply a robust two-step estimator with Windmeijer’s finite-sample correction. I collapse the instruments to avoid the problem of instrument proliferation (Roodman 2009). Table 2.6 shows the results and the specification tests of the model. The specification tests show that the model is well specified. The null hypothesis of no first-order autocorrelation is rejected, while the null hypothesis of no second-order autocorrelation cannot be rejected. Also, for the tests of over-identifying restrictions – the Hansen’s  $J$  test and the Difference  $J$  test

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– the null hypotheses cannot be rejected. Inferences for the election year dummies do not change.<sup>24</sup> Important to note is that the coefficient of the lagged dependent variable is negative and statistically significant at the 1 percent level, indicating that first differences in per-capita fees in period  $t$  were small when first differences in per-capita fees in period  $t-1$  were large. The results in Column (4) corroborate that fees per capita increase less in election years and increase more directly after elections compared to years in the middle of the legislative period.

I also run the baseline model separately for independent cities and municipalities that belong to a county. Tasks differ between independent cities and municipalities because independent cities have to fulfill more tasks. When I consider only municipalities that belong to a county, inferences for the election year variables do not change. For the sample that only includes the independent cities, the coefficients of the election year variables do not turn out to be statistically significant. The results may however be driven by the smaller sample size since the sample only includes 82 independent cities.

I examine whether the results are driven by municipalities of one state. I exclude municipalities of an individual state, one at a time (jackknife test). The results show that inferences do not change when excluding municipalities of one state. Only when I exclude the municipalities of the state of Rhineland-Palatinate, the coefficient of the election year variable is negative but lacks statistical significance at conventional levels. This result may also be driven by the large reduction in the sample size since Rhineland-Palatinate has the largest number of municipalities of all German states. The municipalities in Rhineland-Palatinate also have a rather small population. The result thus may also indicate that small municipalities are more prone to election cycles compared to larger municipalities. To test this hypothesis, I also run separate regressions for municipalities with a population above the median municipality of my sample and below. Inferences do not change when I only include municipalities above the median value or below.

The constitutional framework that describes the rights of a local council is similar across the states in Germany. Most states follow the so-called *Süddeutsche Ratsverfassung* since the 1990s. One exception is Hesse, that follows another framework (*unechte Magistratsverfassung*). In the past, even more different frameworks were implemented. The differences mainly affected the position of the mayor and the relationship between the council and the mayor.<sup>25</sup> Since in all municipalities the local council can decide on fees by law, a different constitutional framework should not influence the results. Additionally, my sample period covers the elections after the constitutional reforms in the 1990s and thus belongs to the period, when the

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<sup>24</sup> When I include the lagged dependent variable in my fixed effects model, the results are similar to the GMM results.

<sup>25</sup> For more details, see Kost and Wehling (2010) or Egner et al. (2013).

states already had similar constitutional frameworks.<sup>26</sup> Excluding municipalities in Hesse – the only state with a different constitutional framework – does not change inferences.<sup>27</sup>

I disentangle effects for positive and negative first differences of per-capita fees. The number of positive and negative changes in per-capita fees nearly equals for the observed period. Inferences for the election year variables do not change when I only include positive changes in per-capita fees. When I only consider negative changes, the coefficient of the election year variable and the coefficients of the pre- and post-election year variables are positive and statistically significant. The result for the election year variable in the baseline specification is, thus, mainly driven by positive first differences of per-capita fees, *i.e.*, by increases in per-capita fees.

I include the dependent variable in levels instead of first differences. The results show that inferences for the election year variables do not change except for the fact that the coefficient of the pre-election year variable is negative and statistically significant at the 5 percent level in this case.

Using dummy variables as election indicators may be prone to measurement errors (Klomp and de Haan 2013). I employ an alternative definition of election variables suggested by Franzese (2000) and Klomp and de Haan (2013). I use a weighted election indicator that takes the timing of an election within a year into account. The idea is that election years where the election is late within a year should get a higher weight, since the local council has an incentive to reduce fees before elections and thus has more time to do this. The variable takes the value  $M/12$  in an election year, where  $M$  is the month of the election. The pre-election year variable is calculated as  $(12-M)/12$ , while the post-election year variable is calculated as  $(M-1)/12$ , following the literature (Klomp and de Haan 2013, Garmann 2017). In all other years, the value is zero. The results show again that per-capita fees increase less in election years and increase more in post-election years than in the middle of the legislative period. Both coefficients are significant at the 1 percent level. The coefficient for the pre-election year is positive but lacks statistical significance.

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<sup>26</sup> The reforms took place 1993 in Hesse, 1994 in Saarland and Rhineland-Palatinate, 1996 in Lower Saxony and 1999 in North Rhine-Westphalia. In Bavaria and Baden-Wuerttemberg the *Süddeutsche Ratsverfassung* was already implemented in the 1950s (Burgi 2015).

<sup>27</sup> A main part of the reforms referred to the introduction of direct mayoral elections. In some states, *e.g.*, Bavaria, mayoral elections are aligned with council elections, in others not. It is conceivable that mayoral elections influence the setting of fees rather than local council elections since the mayor is often involved in preparing the drafts for new regulations for the fees. But even if mayoral elections also influence decision-making on fees, this finding only supports the result of this chapter since it shows that local elections influence the setting of fees.

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I also control for nonlinear effects of population growth by including the first differences of the population variable squared. Inferences for the election variables do not change. The coefficient of the nonlinear effect of the population variable is negative but lacks statistical significance.

An alternative to using the vote share is to include the seat shares of the individual parties. Since data on seat shares are not available for municipalities in Lower Saxony, the sample size is reduced to 74,274 observations. Inferences do not change. Now, also the coefficient of the CDU seat share variable is negative and statistically significant at the 1 percent level. In another specification, I tested for the ideology of the council by including the share of left-wing parties (vote share of SPD and Greens) and the share of right-wing parties (vote share of CDU and FDP) in the estimations. Inferences for the election year variables do not change. The coefficient for the left-wing parties is positive, and the coefficient for the right-wing parties is negative. Both coefficients lack, however, statistical significance.

To further control for the economic situation of a municipality, I also include the lagged unemployment rate of each municipality (unemployed as a share of total population between 15 and 65).<sup>28</sup> The sample size with this control added reduces considerably to only 50,350 observations. Inferences for the pre- and post-election year variables do not change. The negative coefficient of the election year variable lacks statistical significance. Tests show that this result emerges because of the reduced sample size and not because of the inclusion of the unemployment rate. The coefficient of the unemployment rate, however, lacks statistical significance at conventional levels.

I also checked my main results for the subcategories by running the same robustness tests as described above. None of these tests shows any severe fragility of the inferences of the election year variables.

## 2.6 Conclusion

I examine electoral cycles in revenues from fees of around 7,000 West German municipalities (1992–2006). In Germany, municipalities provide many public services, which are financed by fees. The local councils of municipalities are by law responsible for setting fees and have a large leeway to do so. By investigating local council elections and first differences in per-capita fees, the results show that per-capita fees increase less in election years than in the middle of the legislative period. Fees increase – conditional on the other explanatory variables – by about 0.94 euro per capita less in election years compared to the middle of the legislative period. Per-capita fees increase more directly after elections. This indicates that local councils seem to increase fees most when the time gap to the next election is maximized. The results

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<sup>28</sup> Data on unemployment is only available from 1998 onwards for all municipalities. I thus do not include this control variable in my baseline model.

for specific public service categories (waste management, sewerage provision and child care facilities) confirm these results.

The findings contribute to the literature on political business cycles and show that election-motivated incentives may well influence policies on the subnational level. In terms of taxation principles in public finance, this chapter also shows that reelection motives of local governments influence beside taxes, which are levied according to the ability-to-pay principle, also fees, which are levied according to the benefit principle. This might be because nearly all voters are affected by fees and are thus more sensitive towards changes in fees than for example towards changes in local business tax rates. As fees are regressive, German municipalities also seem to manipulate low-income voters more than high-income voters. The evidence on election cycles in communal fees raises also concerns about the given leeway of local councils. Although municipalities should be restricted in setting fees by the cost-covering principle, the local councils have a large leeway to decide on fees. A possible solution to reduce this leeway and thus the emergence of election cycles in communal fees could be an enhanced transparency in the calculations of fees.

Future research might well consider whether also direct mayoral elections influence the setting of fees as the mayor may influence the decision-making process of fees. Another worthwhile endeavor is to investigate the enhanced privatization or out-sourcing of communal services in the past years, which provides an intriguing setup to compare developments in fees/prices of public and privatized utilities.



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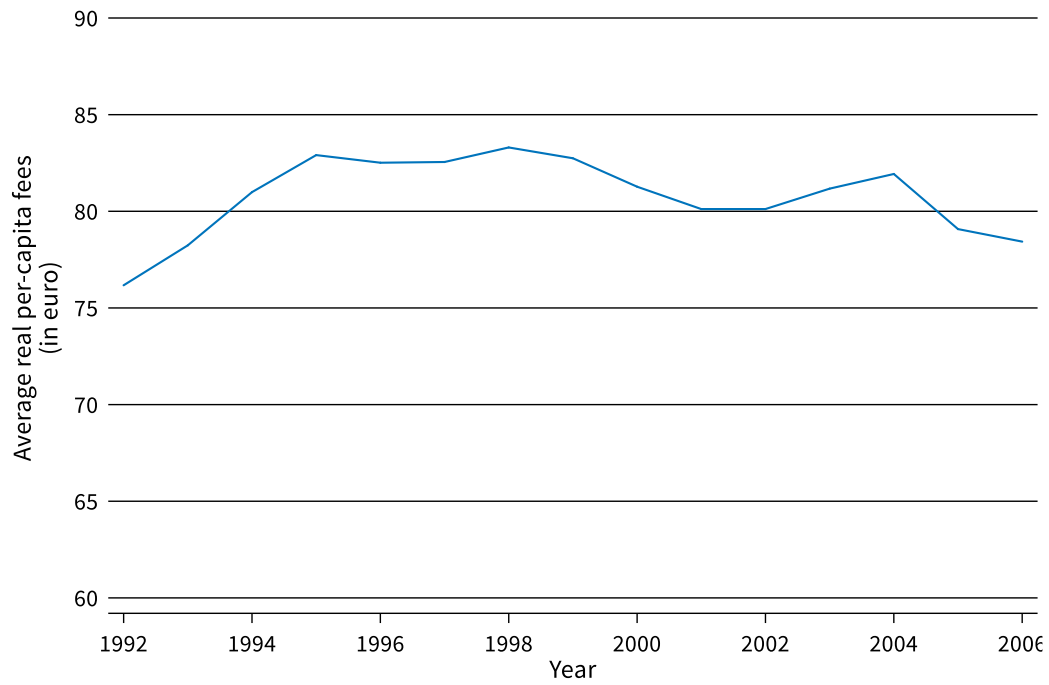
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## Appendix

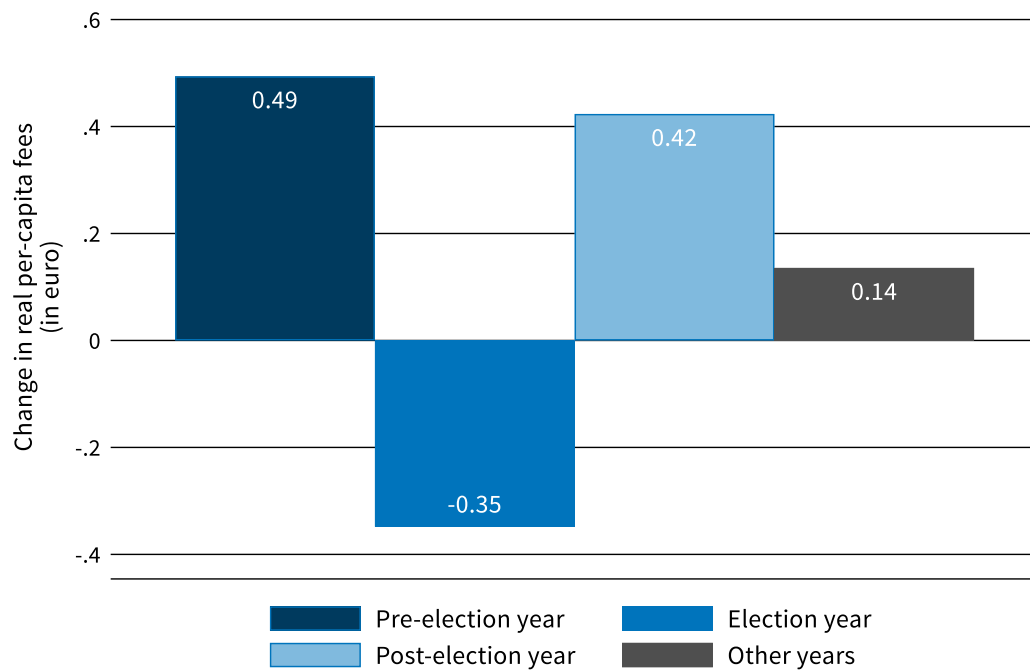
Figure 2.1: Average revenues from utilization fees in per-capita terms, 1992–2006



Source: own illustration.

## Communal fees and election cycles

Figure 2.2: Average change in per-capita fees by election year variables



Source: own illustration.

Table 2.1: Descriptive statistics

	Obs.	Mean	Std. Dev.	Min	Max
Fees per capita	108,463	80.78	85.01	0	1,319
Δ Fees per capita	101,199	0.163	20.95	-907.2	458.2
Pre-election year	101,199	0.194	0.395	0	1
Election year	101,199	0.198	0.399	0	1
Post-election year	101,199	0.185	0.388	0	1
Population ( <i>t</i> -1)	108,519	8.189	32.52	0.006	1,295
Δ Population ( <i>t</i> -1)	86,159	0.017	0.253	-19.89	34.93
Young ( <i>t</i> -1)	108,513	0.193	0.035	0.019	0.56
Δ Young ( <i>t</i> -1)	86,159	-0.002	0.008	-0.227	0.169
Old ( <i>t</i> -1)	108,510	0.182	0.052	0.003	0.536
Δ Old ( <i>t</i> -1)	86,159	0.003	0.008	-0.204	0.284
Debt per capita ( <i>t</i> -1)	100,725	422.9	405.0	0	12,003
Δ Debt per capita ( <i>t</i> -1)	86,159	-0.157	114.7	-2,392	5,771
Property tax B	105,216	304.5	45.17	0	900
Δ Property tax B	86,159	3.265	11.03	-280	280
Business tax	105,216	332.3	30.20	116	900
Δ Business tax	86,159	1.640	7.215	-346	214
Vote share SPD	86,159	0.183	0.190	0	1
Vote share CDU	86,159	0.244	0.232	0	1
Vote share FDP	86,159	0.012	0.032	0	0.578
Vote share Greens	86,159	0.016	0.036	0	0.313
Vote share Others	86,159	0.353	0.360	0	1

Note: Descriptive statistics are calculated for the observations used in the individual regressions. Variables in levels include all observations that are used to calculate the first differences, which are used in the regressions. I define variables in Section 2.4.2.



## Communal fees and election cycles

**Table 2.2: Correlation between the main variables**

	$\Delta$ Fees per capita	Pre-election year	Election year	Post-election year
$\Delta$ Fees per capita	1			
Pre-election year	0.008**	1		
Election year	-0.012***	-0.244***	1	
Post-election year	0.006*	-0.234***	-0.237***	1

Note: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . I define variables in Section 2.4.2.

**Table 2.3: Local election dates**

State				
Baden-Wuerttemberg	12-06-1994	24-10-1999	13-06-2004	
Bavaria	10-03-1996	03-03-2002		
Hesse	07-03-1993	02-03-1997	18-03-2001	26-03-2006
Lower Saxony	15-09-1996	09-09-2001	10-09-2006	
North Rhine-Westphalia	16-10-1994	12-09-1999	26-09-2004	
Rhineland-Palatinate	12-06-1994	13-06-1999	13-06-2004	
Saarland	12-06-1994	13-06-1999	13-06-2004	

Note: Election dates are listed in DD-MM-YYYY.

Table 2.4: OLS regression results

	(1)	(2)	(3)	(4)
Pre-election year	0.679*** (0.178)	0.565** (0.233)	0.929*** (0.267)	0.925*** (0.267)
Election year	-0.133 (0.173)	-0.913*** (0.200)	-0.945*** (0.196)	-0.940*** (0.196)
Post-election year	0.577*** (0.191)	1.641*** (0.271)	1.728*** (0.282)	1.740*** (0.282)
$\Delta$ Population ( $t-1$ )			0.435 (0.684)	0.429 (0.681)
$\Delta$ Young ( $t-1$ )			19.53* (10.34)	19.69* (10.35)
$\Delta$ Old ( $t-1$ )			13.58 (9.454)	13.85 (9.453)
$\Delta$ Debt per capita ( $t-1$ )			0.00647*** (0.00183)	0.00646*** (0.00183)
$\Delta$ Property tax B			0.0125 (0.00802)	0.0122 (0.00802)
$\Delta$ Business tax			0.00814 (0.0105)	0.00811 (0.0105)
Vote share CDU				-1.753 (1.144)
Vote share FDP				-9.944* (5.507)
Vote share Greens				-9.454* (5.345)
Vote share Others				-1.031** (0.435)
Time-fixed effects	-	Yes	Yes	Yes
Observations	101,199	101,199	86,159	86,159
Groups	7,235	7,235	7,235	7,235
R <sup>2</sup> within	0.000257	0.00594	0.00698	0.00707
R <sup>2</sup> between	0.0253	0.00592	0.0471	0.0382
R <sup>2</sup> overall	0.000150	0.00562	0.00765	0.00850

Dependent variable: Real fees per capita (first differences). Fixed-effects model with robust standard errors clustered at municipality level in parentheses. All specifications include municipality-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

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Table 2.5: OLS regression results for subcategories

	(1)	(2)	(3)
	Waste	Sewerage	Child care facilities
Pre-election year	-0.357 (0.231)	0.343 (0.321)	0.0981* (0.0532)
Election year	-0.556*** (0.181)	-1.275*** (0.282)	-0.0507 (0.0619)
Post-election year	0.107 (0.223)	0.875*** (0.291)	0.187*** (0.0494)
$\Delta$ Population ( $t-1$ )	-0.546** (0.259)	0.837 (0.656)	0.0374** (0.0173)
$\Delta$ Young ( $t-1$ )	15.72 (13.98)	34.48 (26.34)	27.54*** (4.724)
$\Delta$ Old ( $t-1$ )	-0.388 (17.51)	7.957 (35.77)	9.019 (6.270)
$\Delta$ Debt per capita ( $t-1$ )	-0.000798* (0.000436)	0.00586*** (0.00106)	0.000223 (0.000144)
$\Delta$ Property tax B	-0.000962 (0.00534)	0.00836 (0.00971)	0.00377*** (0.00146)
$\Delta$ Business tax	-0.00206 (0.00958)	0.00231 (0.0171)	0.000513 (0.00253)
Vote share CDU	-1.639 (1.313)	-2.766** (1.363)	-0.105 (0.580)
Vote share FDP	-21.46*** (7.371)	-9.166 (9.311)	-0.0575 (1.440)
Vote share Greens	-1.397 (5.639)	-7.378 (5.252)	-1.665* (0.945)
Vote share Others	-0.436 (0.915)	-2.911*** (1.023)	-0.262 (0.460)
Time-fixed effects	Yes	Yes	Yes
Observations	18,983	38,672	21,451
Groups	1,717	3,419	1,682
R <sup>2</sup> within	0.0104	0.0189	0.0298
R <sup>2</sup> between	0.00585	0.0115	0.0436
R <sup>2</sup> overall	0.00343	0.0179	0.0305

Dependent variable: Real fees per capita (first differences). Fixed-effects model with robust standard errors clustered at municipality level in parentheses. All specifications include municipality-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 2.6: GMM results

	(1)	(2)	(3)	(4)
Lagged dependent variable	-0.174*** (0.014)	-0.177*** (0.0141)	-0.192*** (0.0166)	-0.192*** (0.0166)
Pre-election year	0.379** (0.192)	0.414* (0.247)	0.316 (0.244)	0.405* (0.244)
Election year	-0.269 (0.176)	-1.012*** (0.199)	-1.160*** (0.198)	-1.074*** (0.199)
Post-election year	0.194 (0.181)	0.929*** (0.253)	0.869*** (0.251)	0.925*** (0.251)
$\Delta$ Population ( $t-1$ )			0.0447 (0.660)	0.242 (0.710)
$\Delta$ Young ( $t-1$ )			15.21 (10.10)	17.32* (10.13)
$\Delta$ Old ( $t-1$ )			3.192 (9.880)	5.560 (9.908)
$\Delta$ Debt per capita ( $t-1$ )			0.00469** (0.00221)	0.00458** (0.00221)
$\Delta$ Property tax B			0.00572 (0.00811)	0.00788 (0.00811)
$\Delta$ Business tax			-0.000346 (0.0108)	0.000675 (0.0108)
Vote share CDU				-0.366 (0.253)
Vote share FDP				-9.621*** (2.213)
Vote share Greens				-21.51*** (2.398)
Vote share Others				1.479*** (0.156)
Time-fixed effects	-	Yes	Yes	Yes
Observations	93,935	93,935	86,125	86,125
Groups	7,235	7,235	7,235	7,235
Number of instruments	17	29	35	39
AR(1) test $p$ -value	0.000	0.000	0.000	0.000
AR(2) test $p$ -value	0.930	0.996	0.972	0.967
Hansen's $J$ test $p$ -value	0.102	0.092	0.116	0.117
Difference $J$ test $p$ -value	0.725	0.792	0.830	0.842

Dependent variable: Real fees per capita (first differences). System GMM model with two-step estimator with Windmeijer's finite-sample correction. Instruments are collapsed. Standard errors in parentheses. All specifications include municipality-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## Communal fees and election cycles

### 3 Electoral cycles in MPs' salaries: Evidence from the German states

#### Abstract

Members of parliament (MPs) often set their own salaries. Voters dislike self-serving politicians, and politicians are keen to please voters. In line with political business cycle theories, politicians thus may delay giving themselves a salary increase until after elections. We investigate electoral cycles in the salary increases of German state MPs. Using data for 15 states over the period 1980–2014, we find no evidence that increases in MP salaries are influenced by election cycles. Politicians can increase their salaries at any point during the legislative period without negative consequences. We posit that this may be because even those voters who are most disenchanted with politics likely understand that all politicians benefit from a salary increase and thus do not punish the governing party at the polls.

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### 3.1 Introduction

In many countries, members of parliament (MPs) set their own salaries (*e.g.*, Mause 2014), thus giving them the opportunity to behave in a self-serving manner and engage in political rent extraction. The possibility of rent extraction provides self-serving politicians with incentives for rent creation and rent sharing (Hillman 2015).<sup>1</sup> Voters dislike self-serving politicians and may accuse politicians of misusing taxpayers' money when increases in salaries appear to be too high.<sup>2</sup> Because politicians are keen to please voters and the media often discusses changes in politicians' salaries, politicians may delay giving themselves a raise until after elections. Voters seem to be aware of salary increases: search requests on the internet for MP salary increases were on average 1.96 times higher in months where a decision on salary increases took place, compared to months with no decisions on salary adjustments.<sup>3</sup> As a consequence, self-induced increases in MP salaries may be a prime example of electoral cycles.<sup>4</sup>

According to political business cycle theories, election-motivated politicians pursue expansionary policies before elections. For example, election-motivated politicians may increase public spending, and especially public spending that is visible to voters, or they may decrease taxes (Nordhaus 1975, Rogoff and Sibert 1988). Many empirical studies demonstrate how election-motivated politicians manipulate economic policy-making.<sup>5</sup> In Germany, electoral cycles occur at all levels of government, and particularly on the state level: elections have been shown to influence the hiring of teachers and police officers, cultural policies, deficit spending, social security expenditure, active labor market policies, fiscal forecasts, number of hospital beds, firm investment, and business perceptions (Tepe and Vanhuyse 2009, 2013, 2014,

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<sup>1</sup> On the importance of recognizing political rent seeking in the analysis of public policy, see Hillman and Ursprung (2016). An example for rent extraction is employing a spouse; see Kauder and Potrafke (2015, 2016).

<sup>2</sup> A survey among citizens in 2007 showed that 46 percent of the citizens think that MP salaries are too high, while only 4 percent believe that they are too low compared to top-level executives (Welt online, see <https://www.welt.de/politik/article1475841/Buerger-glauben-dass-Politiker-genug-verdienen.html>).

<sup>3</sup> We used Google Trends to examine search requests in the German states over the period 2004–2014. We calculated for each state the average value for search requests on MP salary increases in months where a decision on salary increases in the individual state took place, and the average value for the other months.

<sup>4</sup> Salaries, of course, are only one part of politicians' remuneration (see von Arnim 1998, 2010); however, increases in other parts (such as pensions) are less visible and thus may be less likely to show electoral effects.

<sup>5</sup> On political budget cycles in the European Union, see Efthyvoulou (2012); on political budget cycles in a larger set of countries, see de Haan and Klomp (2013) and Klomp and de Haan (2013). Kneebone and McKenzie (2001), Katsimi and Sarantides (2012), Köppl-Turyna et al. (2016), Bove et al. (2017), and Castro and Martins (2018) investigate how elections and Tsai (2016) how the timing of the National Congress of the Communist Party in China influence budget composition. Osterloh (2012) and Potrafke (2012a) examine how elections influence economic performance. Incumbents increase the growth in public health expenditures and engage in creative accounting before elections (Potrafke 2010, Herwartz and Theilen 2014, Reischmann 2016). Foreign reserves in democracies tend to be lower before elections (Jäger 2016). Transparency may mitigate political budget cycles (Benito and Bastida 2009). On public investment and reelection prospects, see Katsimi and Sarantides (2015).

Schneider 2010, Mechtel and Potrafke 2013, Riem 2016a, b, Kauder et al. 2017).<sup>6</sup> At the municipal level, elections have been shown to influence local business tax rates, public administration decisions and total spending (Foremny and Riedel 2014, Garmann 2017, Foremny et al. 2018). Evidence about electoral cycles at the federal level suggests that elections influence centralized wage negotiations in the public sector (Matschke 2003), but not macroeconomic indicators or social policies (Berger and Woitek 1997, Potrafke 2012b).<sup>7</sup>

What is the optimal salary for a politician? The literature concludes that there are two reasons justifying high salaries for politicians: they may have an incentive effect and thus improve performance and/or higher wages may attract better candidates (Besley 2004, Caselli and Morelli 2004, Messner and Polborn 2004, Mattozzi and Merlo 2008, Keane and Merlo 2010, Bordignon et al. 2013). Indeed, empirical studies suggest that higher wages attracted more educated candidates in Italy and Brazil (Gagliarducci and Nannicini 2013, Ferraz and Finan 2009) and increased the quality of female candidates in Finland (Kotakorpi and Poutvaara 2011). In the European parliament, by contrast, increased salaries resulted in less experienced newly elected politicians and decreased the quality of politicians as measured by quality of college attended (Braendle 2015, Fisman et al. 2015). Evidence on how salaries influence efforts in the European parliament is mixed (Mocan and Altindag 2013, Fisman et al. 2015, Braendle 2015; for a survey, see Braendle 2016).<sup>8</sup>

In the German states during the 1980s, 1990s, and 2000s, MPs set their salaries annually (in 2017, at least in most states, MP salaries are coupled with employee salaries). We combine the literature on electoral cycles with that on politicians' salaries to investigate whether electoral cycles occur in the salaries of German state MPs. The fact that election dates vary across the German states means that we can disentangle the effect of elections from common trends. Using data for 15 German states over the period 1980–2014, we find no evidence that elections influence when MPs decide to increase their salaries.

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<sup>6</sup> On electoral cycles in other federal states such as the United States, see, for example, Cahan (2017). In federal states, the welfare costs of political budget cycles at the state level may be reduced by using federal fiscal transfers (Aronsson and Granlund 2017).

<sup>7</sup> In the United Kingdom, elections influence MPs' outside activities (Geys 2013). In the United States, bureaucrats' salaries increase more in election years (Borjas 1984). See Vadlamannati (2015) on electoral cycles and anti-corruption policies. Political cycles may be influenced by term limits (Klein and Sakurai 2015, Dalle Nogare and Kauder 2017) and globalization (Efthyvoulou 2011).

<sup>8</sup> Holding political office may also give rise to private returns (Eggers and Hainmueller 2009, Querubin and Snyder 2013, Fisman et al. 2014, Kotakorpi et al. 2017), which may, in turn, influence parliamentary effort (Gagliarducci et al. 2010, Arnold et al. 2014, Geys and Mause 2016; for a survey on moonlighting politicians, see Geys and Mause 2013). See Peichl et al. (2013) on differences between the salaries of politicians and those of private-sector executives in Germany; Elliott et al. (2005) compare public- and private-sector pay in the United Kingdom. Voters' education and United States governors' salaries have been shown to be negatively correlated (Mirhosseini 2016).



## 3.2 Institutional backdrop

### 3.2.1 MP salaries in the German states

German state politicians set their salaries and typically codify adjustments in specific acts (*Abgeordnetengesetz*).<sup>9</sup> Over the years, several reforms have changed the way salaries are calculated. In the 1950s and 1960s, state MP salaries in West German states were often coupled with the salaries of members of the federal parliament (*Bundestag*). In 1975, the Supreme Court emphasized that MPs should be financially independent and adjudicated that the (state) parliaments have the discretion to set their MP salaries (see von Arnim 1975). The states accordingly revised the way salaries were set and thus had large leeway in deciding on the amount of salaries. After reunification, the East German states mainly adopted the procedures of the West German states, with the exception of Thuringia, which decided to index MP salaries to employee salaries.

In 1996, Bavaria was the first state to follow Thuringia's lead and began indexing MP salaries. Most other states followed suit in the early 2000s and no longer adjust MP salaries discretionarily (in 2017, only one state does not index politicians' salaries). At the beginning of every legislative period, the state parliaments decide on how to index MP salaries, which then increase annually. In most states, increases in MP salaries are linked to those of employees in the private and public sectors; some states use other indicators such as inflation. The statistical office of each state reports the figures to the president of the state parliament, who then publishes the new salaries in a law gazette. Lower Saxony is the only state in which the parliament votes on MP salaries every year; in the other states, the parliament is not involved on an annual basis.

### 3.2.2 State elections

The German states hold elections every five years. The only exceptions are Hamburg and Bremen, where elections are held every four years. In the past, even more states held elections every four years. Parliaments may also call early elections: out of 86 elections in our sample, 13 were early elections. In most states, voters cast two votes in a personalized proportional representation system. The first vote determines which candidate is to obtain the direct mandate in one of the electoral districts with a relative majority. With the second vote, voters select an individual party. The parties obtain the number of seats in parliament that corresponds to the party's second vote share. Candidates voted into the parliament with the first vote (direct mandate) obtain their seats first. Candidates from party lists obtain the remaining seats.

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<sup>9</sup> See Weichold (2001) on the historical development of how MP salaries are set. Gersbach (2009) examines how welfare is affected when candidates offer their individual salaries competitively.

### 3.3 Empirical analysis

#### 3.3.1 Descriptive statistics

We use data on MPs' nominal salaries taken from state law gazettes, as well as data from the federal and the states' statistical offices, the state election administrators, the German Bundestag, and the German Council of Economic Experts. We use annual data over the period 1980–2014 for the West German states and over the period 1991–2014 for the East German states. We only use data for non-indexed years, meaning that for some states, our data end earlier than 2014 because these states began indexing MP salaries prior to that year (see Section 3.2.1). We exclude Thuringia because MP salaries in Thuringia are coupled with the general development of wages since 1990. We also exclude increases in salaries of over 20 percent, which represent increases after reforms in parliament such as adjusting the taxation of salaries or when parliaments declared to transform a part-time parliament into a full-time parliament.<sup>10</sup> The sample includes 15 states and 367 observations.<sup>11</sup>

Figure 3.1 shows the average increase in MPs' nominal salaries after and before elections. MP salaries increased on average by 1.99 percent when it was the first increase within the 365 days after an election, and by 2.07 percent when it was the last increase within the 365 days before an election. At other times during the legislative period, MP salaries increased on average by 2.53 percent. T-tests on means indicate that neither post-election nor pre-election increases are significantly different from increases at other points in time.

To more clearly see the nexus between points of time in a legislative period and increases in salaries, the left part of Figure 3.2 shows the result of a nonparametric regression of increases in salaries on the share of a legislative period that has passed, using kernel-weighted local polynomial smoothing; the right part shows a semi-parametric regression including all our (parametric) control variables (see Boone et al. 2014, pp. 404–407). Both panels corroborate the evidence from Figure 3.1 and suggest that MP salaries increased somewhat less at the beginning and at the end of a legislative period. The regular pattern of local minima arises from our coding of pay freezes (see footnote 11).

Table 3.1 sets out descriptive statistics. Table 3.2 contains the correlation coefficients between our main variables. Increases in MP salaries are barely correlated with the post-election

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<sup>10</sup> There were 14 salary increases above 20 percent during 1980–2014. In a part-time parliament, politicians may well work in addition to their parliamentary function. In a full-time parliament, the parliamentary function is full-time and other professional activities are possible only to a limited extent.

<sup>11</sup> In some cases, salaries were not increased. To define the dates on which these pay freezes were decided on, we use the average day on which increases in salaries were decided on in other years in the respective state. In our sample, we defined 172 artificial dates for the pay freezes.

and pre-election dummy variables (correlation coefficients: -0.05 and -0.04) or with the number of days since the last election (0.02). Increases in MP salaries and in lagged employee salaries are somewhat correlated (0.34); see also Figure 3.3.

### 3.3.2 Empirical strategy

The baseline panel-data model has the following form:

$$\begin{aligned} \text{Increase in MP salaries}_{i,t} = & \beta \text{Post-election period}_{i,t} + \gamma \text{Pre-election period}_{i,t} \\ & + \delta \text{Increase in employee salaries}_{i,t-1} + \varepsilon \text{Deficit ratio}_{i,t-1} \\ & + \zeta \text{Government ideology}_{i,t} + \varphi \text{Seat share government}_{i,t} + \eta_i + \tau_t + u_{i,t} \end{aligned}$$

with  $i = 1, \dots, 15$ ;  $t = 1, \dots, 35$

where *Increase in MP salaries*<sub>*i,t*</sub> measures the increase in MPs' nominal salaries in state *i* in year *t* (growth rate). The dummy variable *Post-election period*<sub>*i,t*</sub> assumes the value of 1 for the first increase in salaries within the 365 days after an election and is 0 otherwise. The dummy variable *Pre-election period*<sub>*i,t*</sub> takes the value of 1 for the last increase in salaries within the 365 days before an election.<sup>12</sup> The reference category is thus the period between the post- and the pre-election period (note that predetermined elections are not prone to reverse causality). In alternative specifications, we use a variable measuring the number of days since the last election divided by the total length of the legislative period (*Share of legislative period passed*<sub>*i,t*</sub>) instead of dummy variables for the post- and the pre-election periods.<sup>13</sup> Concerns about potential endogeneity of the election variables include reverse causality and omitted variable bias. The election variables are not prone to reverse causality because we deal with early elections. To limit the risk of omitted variable bias, we include many variables that are likely to be correlated with an increase in MP salaries and/or the election variables.

*Increase in employee salaries*<sub>*i,t-1*</sub> measures the extent to which salaries of public- and private-sector employees increased in the previous year (see also Di Tella and Fisman 2004); we consider nominal values of salaries and thus capture both increases in real salaries and inflation. We expect the salaries of private- and public-sector employees to be positively correlated with MP salaries. The variable *Deficit ratio*<sub>*i,t-1*</sub> measures how public debt has increased relative to GDP in state *i* in year *t-1* and is expected to be negatively correlated with MP salaries, under the assumption that MPs are unlikely to increase their salaries when public debt has increased and the topic of how to decrease the debt is a matter of public debate. The variable *Government ideology*<sub>*i,t*</sub> measures ideology-induced policy-making and takes the value of 1 when a

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<sup>12</sup> Note that we only consider the salary increases closest to the election when there was more than one increase in the 365 days after or before an election. In the case of early elections, we consider an increase in salaries only as belonging to the pre-election period when early elections were known at that point of time.

<sup>13</sup> In the case of early elections, we consider the regular length of a legislative period when salaries were increased before early elections were called, and the actual length when salaries were increased after early elections were called.

left-wing government is in office, the value 0.5 for a center government, and is 0 for a right-wing government (e.g., Kauder and Potrafke 2013, Potrafke et al. 2016). The extent to which government ideology correlates with MP salaries is not clear. On the one hand, right-wing governments may believe that MP salaries should be competitive with those of managers or entrepreneurs. On the other hand, right-wing governments favor a smaller size of government than do left-wing governments, and thus, when they are in power, MP salaries may be less generous. It is conceivable that politicians set higher salaries for themselves when their party holds a large majority of seats in parliament (see Benito et al. 2014, Svaleryd and Vlachos 2009). *Seat share government* $_{i,t}$  thus measures the number of seats of the governing parties relative to all seats in parliament.  $\eta_i$  is a fixed state effect;  $\tau_t$  is a fixed time effect;  $u_{i,t}$  is the error term. In some specifications, we include the variable *Increase in federal MP (nominal) salaries* $_{i,t-1}$ , which varies only over time and not over states, instead of fixed time effects. We estimate the fixed effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors; see Huber 1967, White 1980).

### 3.3.3 Regression results

Table 3.3 shows the regression results excluding fixed time effects. In discussing the results, we focus on our preferred specification (Column 3), which includes all control variables. The coefficients of the dummy variables *Post-election period* and *Pre-election period* are negative and thus corroborate the graphical evidence, but lack statistical significance. Increases in MP salaries are positively correlated with increases in employee salaries. The effect attains statistical significance at the 1 percent level and indicates that MP salaries respond with an increase of 0.30 percent to a 1 percent increase in employee salaries in the previous year. The effect is small, but the constant shows a significant effect, indicating that MP salaries increased by 2.65 percent per year (conditional on the other explanatory variables) and politicians thus smooth salary increases over time. Our other control variables (lagged) *Deficit ratio*, *Government ideology*, and (lagged) *Increase in federal MP salaries* do not turn out to be statistically significant. The effect of the variable *Seat share government* indicates that powerful governments increase MP salaries relatively less; however, the effect is statistically significant only at the 10 percent level.

In Table 3.4, we include fixed time effects and thus cannot include *Increase in federal MP salaries* because this variable does not vary across states. Inferences regarding the election period dummies and the effect of employee salaries do not change. However, *Seat share government* loses statistical significance when we include fixed time effects.

Table 3.5 shows the results (excluding fixed time effects) when we use the *Share of legislative period passed* (share of legislative period that has passed at the time MPs decide to increase their salaries) as the main explanatory variable; the effect lacks, however, statistical significance. The coefficient estimate of *Increase in employee salaries* corroborates our results from Table 3.3 and Table 3.4 and indicates that increases in MP and (lagged) employee salaries are

## Electoral cycles in MPs' salaries

positively correlated. Inferences do not change when we include a quadratic term of *Share of legislative period passed* (Columns 4–6): the specifications indicate an inverted u-shaped relationship between the share of a legislative period that has passed and increases in MP salaries and thus corroborate the graphical evidence from Figure 3.2. Again, however, the effects fail to reach statistical significance at conventional levels. The effects of *Share of legislative period passed* and its quadratic term also lack statistical significance when we include fixed time effects in Table 3.6.<sup>14</sup>

As a placebo test, we include in Table 3.7 the indexed years in our sample, increasing sample size to 478 observations. Inferences regarding the election period dummies and the effect of the continuous time variable *Share of legislative period passed* do not change regardless of whether fixed time effects are included or excluded. This also holds for employee salaries.

In Table 3.8, we run the regressions for the indexed years only (111 observations). The coefficients of the election period dummies and employee salaries lack statistical significance. The effect of *Share of legislative period passed* and its quadratic term also lack statistical significance. The variable *Government ideology* is statistically significant in only one specification.

### 3.3.4 Robustness tests

We submitted our results to rigorous robustness tests using different specifications of our regressions and different samples. None of these robustness tests indicates any severe fragility in our results.

We estimated our baseline panel-data model with a fixed effects estimator. However, because many observations of salary increases are zero, a Tobit model may be more suitable. When we use a Tobit cross-section estimator (a parametric conditional fixed effects Tobit panel estimator is not available), the results indicate that MPs increase their salaries less after elections and, in some specifications, also less before elections. The effect of the continuous time variable *Share of legislative period passed* is statistically significant when we also include its quadratic term. The coefficients of both variables indicate that politicians increase their salaries in the middle of the legislative period, thus corroborating the graphical evidence from Figure 3.2. Inferences compared to our baseline model do not change when we use a random effects model. Inferences with a random effects Tobit model are similar to those with a Tobit cross-section estimator.

As an alternative to considering the growth rate of MP salaries as the dependent variable, we used a binary variable that takes the value 1 when salaries were increased and 0 otherwise. With either a probit or logit model, the results show that the probability of an increase in salaries was lower after and before elections. Given the results in Table 3.3 and Table 3.4, this

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<sup>14</sup> By excluding fixed state effects, the continuous time variable is positive and statistically significant at the 10 percent level.

indicates that *positive* increases in MP salaries were higher after and before elections. In fact, if increases were positive, they were on average 4.69 percent after an election and 4.96 percent before an election, but only 4.31 percent at other times.<sup>15</sup> The effect of the continuous time variable *Share of legislative period passed* is statistically significant when we also include its quadratic term.

We also investigated whether it was only extraordinary increases in salaries that were influenced by electoral cycles. To this end, we used a binary variable as the dependent variable that takes the value 1 when MP salaries increased more than (lagged) employee salaries. Again, the results from either a probit or logit model show that the probability of MP salaries increasing more than those of employees was lower before and after elections. We tested whether inferences change when we included the lagged level of MP salaries to control for mean reversion. The results show that a higher lagged level of MP salaries decreased the growth rate of salaries when fixed time effects are excluded, but still do not show that elections influenced salary increases.

In constructing our main explanatory variables *Post-election period* and *Pre-election period*, we captured increases in salaries within the 365 days after or before an election. Inferences do not change when we capture salary increases within 0.5 years or 1.5 years after or before an election. Our alternative main explanatory variable *Share of legislative period passed* is defined as the number of days since the last election divided by the total length of the legislative period. Inferences do not change when we use the number of days since the last election (without dividing by the length of the legislative period) as an explanatory variable.

We investigated the possibility of electoral cycles in MP salary increases in combination with changes of government. We revised our two dummy variables in the way that both variables assume the value 1 for the first (last) increase in salaries within the 365 days after (before) an election only if a change of government happened at that election. Inferences regarding electoral cycles do not change when we revise our dummy variables.

We tested whether inferences change when we include *Increase in employee salaries*, *Deficit ratio*, and *Increase in federal MP salaries* from the respective year and not in lags. The results show that *Increase in employee salaries* does not turn out to be statistically significant when we include fixed time effects, but remains statistically significant when we exclude fixed time effects. The coefficient of *Deficit ratio* is positive and statistically significant in all specifications. The effect of *Increase in federal MP salaries* is statistically significant only in some specifications. The election period dummy variables do not turn out to be statistically significant in any of the specifications. The coefficient of the continuous time variable *Share of legislative period passed* is statistically significant only when we include its quadratic term

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<sup>15</sup> A t-test on means shows that neither post-election nor pre-election increases are significantly different from positive increases at other times.

## Electoral cycles in MPs' salaries

and when we exclude fixed time effects. We also tested whether inferences change when we use *Increase in employee salaries* and *Increase in federal MP salaries* in real terms and include lagged inflation as another control variable to disentangle the effects of real salaries' increases and inflation. Inferences do not change.

Our measure of employee salaries includes net salaries, income tax, and employees' social security contributions. Inferences regarding electoral cycles and the effect of increases in employee salaries do not change when we use an alternative measure of employee salaries that also includes employers' social security contributions. Neither do inferences regarding electoral cycles change when we replace the (lagged) growth in employee salaries with the (lagged) growth in GDP, which is statistically significant at the 10 percent level only in some specifications. To describe the power of a government, we used the seat share of the governing parties in parliament. Inferences regarding electoral cycles and the effect of the power of a government do not change when we use the vote share of the governing parties divided by the vote share of all parties represented in parliament.

We examined whether our results are driven by individual years or individual states. When we exclude individual years or states, one at a time (jackknife test), the results still do not show electoral cycles in MP salaries when we use the electoral period dummies or the share of the legislative period that has passed as main explanatory variables. When we include the quadratic term of *Share of legislative period passed*, the results indicate that MP salaries increased less after and before elections when we exclude the years 1985 or 1993, or the state Baden-Wuerttemberg.

Politicians in the East German states may well differ from politicians in the West German states. The results of separate regressions for East German and West German states do not reveal electoral cycles in MP salaries.

It is conceivable that electoral cycles occur only under some type of government ideology. We thus estimated our model separately for left-wing, right-wing, and center governments. The results do not show electoral cycles in MP decisions on increases in salaries.

### 3.4 Conclusion

During the 1980s, 1990s, and 2000s, German state MPs annually set their own salaries, making German states an excellent laboratory for electoral manipulation. We investigated whether elections influence increases in MP salaries. The results do not show (robust) evidence for electoral cycles in decisions about increasing MP salaries, nor do government ideology or the power of the government influence MP salaries. We do find, however, that increases in MP salaries are positively correlated with increases in employee salaries.

Why is it that increases in MP salaries do not exhibit an electoral cycle? When MPs increase their salaries, they do so for *all* MPs, not only for government MPs. Certainly, voters may punish government politicians for having initiated and voted for salary increases. However, we conjecture that even those voters who are most disenchanted with politics likely understand that all politicians benefit from a salary increase, and thus, there may be no party-specific election ramifications. In short, politicians can give themselves a raise at any point of time without having to fear negative voter reaction. This also explains why governments with a large majority in parliament do not increase salaries more than governments with a fragile majority.



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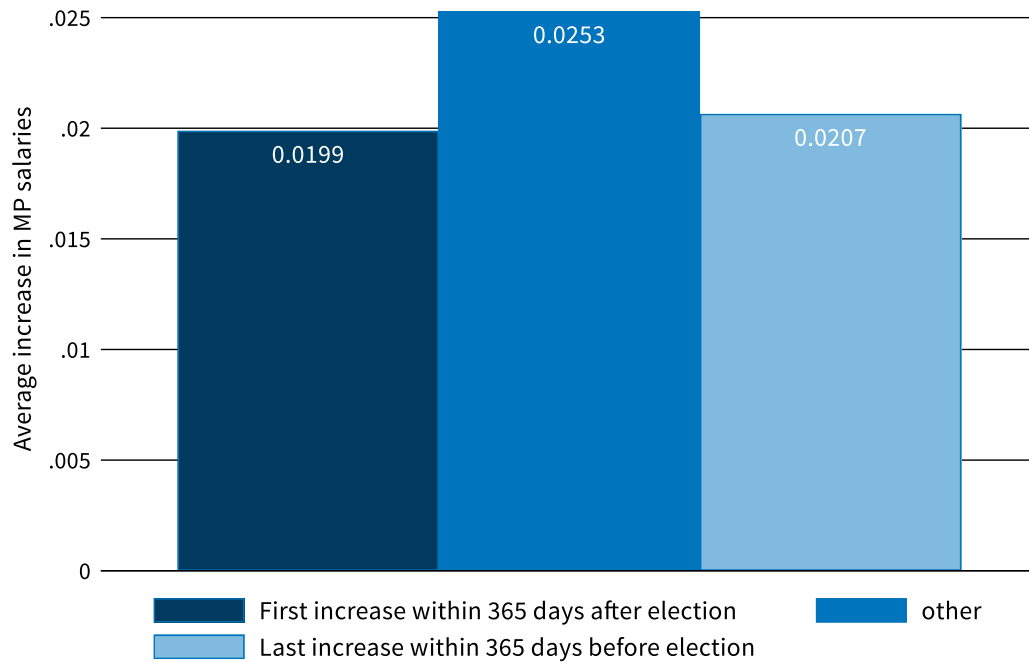
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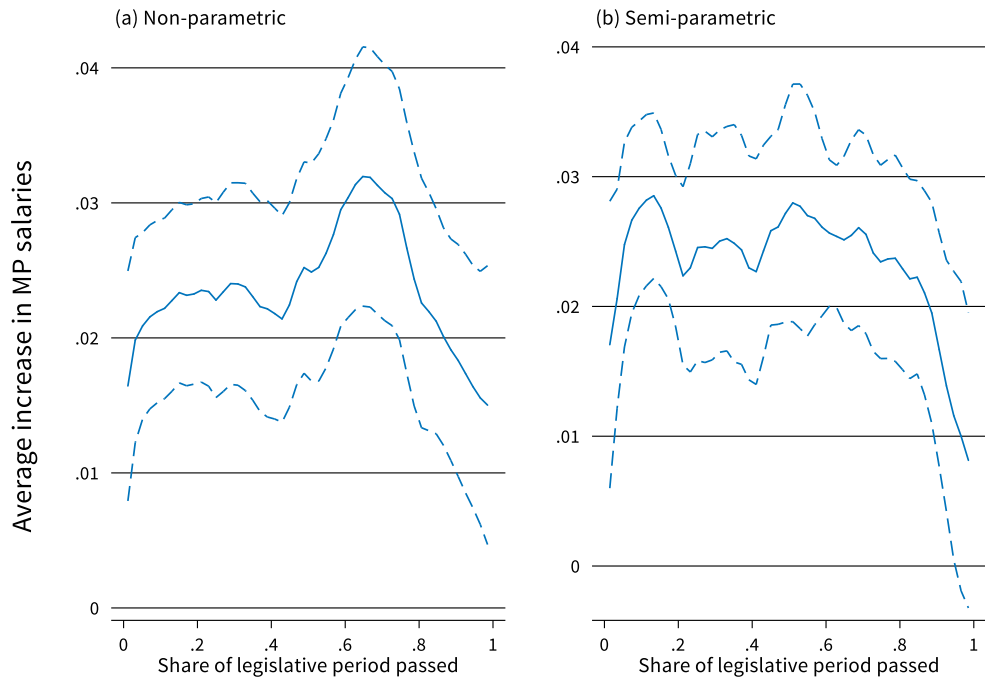
## Appendix

Figure 3.1: Average increase in MP salaries by election period dummies



Source: own illustration.

Figure 3.2: Average increase in MP salaries by share of legislative period passed

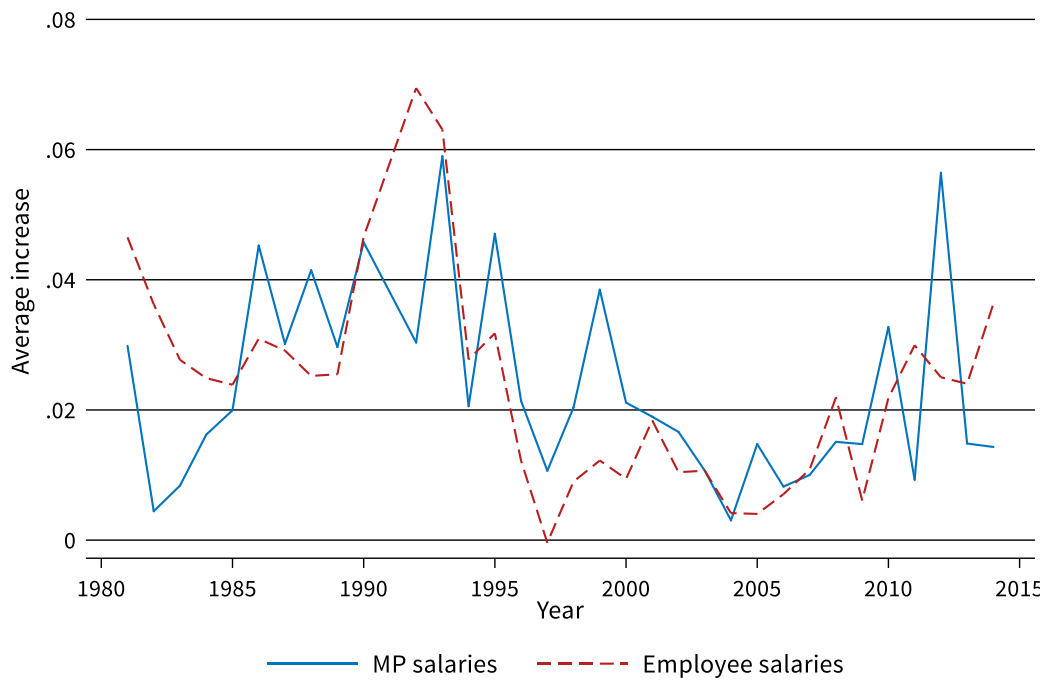


Note: nonparametric regression (no control variables) and semi-parametric regression (including control variables). Dashed lines describe 5 percent confidence intervals (standard errors are bootstrapped with 100 replications). The weighted local polynomial estimates are calculated with the Epanechnikov kernel function with a rule-of-thumb bandwidth estimator. The parametric components are differenced out using the Yatchew method. Source: own illustration.



## Electoral cycles in MPs' salaries

Figure 3.3: Average increase in MP and employee salaries, 1980–2014



Note: The peak in the increase in employee salaries in the early 1990s results from German Reunification.

Source: own illustration.

**Table 3.1: Descriptive statistics**

	Obs.	Mean	Std. Dev.	Min	Max
Increase in MP salaries	367	0.024	0.036	0	0.200
Post-election period	367	0.180	0.385	0	1
Pre-election period	367	0.163	0.370	0	1
Share of legislative period passed	367	0.476	0.279	0.012	0.985
Share of legislative period passed (sq.)	367	0.304	0.283	0.0001	0.971
Increase in employee salaries ( $t-1$ )	367	0.029	0.037	-0.058	0.304
Deficit ratio ( $t-1$ )	367	0.015	0.026	-0.226	0.276
Government ideology	367	0.559	0.454	0	1
Seat share government	367	0.571	0.082	0.405	0.890
Increase in federal MP salaries ( $t-1$ )	367	0.023	0.022	0	0.090

Note: The seat share of a government is below 50 percent in the case of a minority government. We define variables in Section 3.3.2.

**Table 3.2: Correlation between the main variables**

	Increase in MP salaries	Post-election period	Pre-election period	Share of legislative period passed	Increase in employee salaries ( $t-1$ )
Increase in MP salaries	1				
Post-election period	-0.049	1			
Pre-election period	-0.037	-0.188***	1		
Share of legislative period passed	0.016	-0.604***	0.625***	1	
Increase in employee salaries ( $t-1$ )	0.344***	-0.049	-0.029	0.073	1

Note: \*\*\*  $p < 0.01$ . We define variables in Section 3.3.2.

## Electoral cycles in MPs' salaries

**Table 3.3: OLS regression results with election period dummies (I)**

	(1)	(2)	(3)
Post-election period	-0.00311 (0.00459)	-0.00248 (0.00466)	-0.00309 (0.00457)
Pre-election period	-0.00397 (0.00690)	-0.00325 (0.00690)	-0.00330 (0.00694)
Increase in employee salaries ( <i>t</i> -1)		0.301*** (0.0601)	0.296*** (0.0616)
Deficit ratio ( <i>t</i> -1)		-0.0688 (0.0685)	-0.0778 (0.0699)
Government ideology			0.000582 (0.00412)
Seat share government			-0.0221* (0.0116)
Increase in federal MP salaries ( <i>t</i> -1)			0.130 (0.0936)
Constant	0.0249*** (0.00150)	0.0168*** (0.00163)	0.0265** (0.00917)
Time-fixed effects	-	-	-
Observations	373	367	367
Groups	15	15	15
R <sup>2</sup> within	0.00231	0.0941	0.103
R <sup>2</sup> between	0.219	0.858	0.826
R <sup>2</sup> overall	0.00305	0.121	0.126

Dependent variable: Increase in MP salaries (growth rate). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 3.4: OLS regression results with election period dummies (II)

	(1)	(2)	(3)
Post-election period	-0.00267 (0.00410)	-0.00313 (0.00435)	-0.00298 (0.00439)
Pre-election period	-0.00640 (0.00747)	-0.00694 (0.00812)	-0.00685 (0.00818)
Increase in employee salaries ( <i>t</i> -1)		0.365*** (0.0898)	0.356*** (0.0915)
Deficit ratio ( <i>t</i> -1)		-0.0601 (0.0585)	-0.0602 (0.0580)
Government ideology			-0.00132 (0.00447)
Seat share government			-0.0174 (0.0168)
Constant	0.0137 (0.0112)	0.00538 (0.0107)	0.0177 (0.0138)
Time-fixed effects	Yes	Yes	Yes
Observations	373	367	367
Groups	15	15	15
R <sup>2</sup> within	0.182	0.247	0.248
R <sup>2</sup> between	0.0136	0.801	0.795
R <sup>2</sup> overall	0.157	0.262	0.262

Dependent variable: Increase in MP salaries (growth rate). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*\*\*  $p < 0.01$ .

## Electoral cycles in MPs' salaries

**Table 3.5: OLS regression results with continuous time variable (I)**

	(1)	(2)	(3)	(4)	(5)	(6)
Share of legislative period passed	0.000241 (0.00588)	-0.00166 (0.00676)	-0.00116 (0.00728)	0.0373 (0.0221)	0.0361 (0.0236)	0.0363 (0.0228)
Share of legislative period passed (sq.)				-0.0377 (0.0239)	-0.0383 (0.0266)	-0.0380 (0.0262)
Increase in employee salaries ( <i>t</i> -1)		0.305*** (0.0605)	0.300*** (0.0619)		0.301*** (0.0616)	0.296*** (0.0629)
Deficit ratio ( <i>t</i> -1)		-0.0706 (0.0685)	-0.0796 (0.0697)		-0.0700 (0.0694)	-0.0789 (0.0711)
Government ideology			0.000571 (0.00405)			0.000211 (0.00424)
Seat share government			-0.0224* (0.0115)			-0.0223* (0.0113)
Increase in federal MP salaries ( <i>t</i> -1)			0.125 (0.0953)			0.126 (0.0972)
Constant	0.0236*** (0.00278)	0.0165*** (0.00291)	0.0262** (0.00958)	0.0174*** (0.00388)	0.0103** (0.00435)	0.0202** (0.00725)
Time-fixed effects	-	-	-	-	-	-
Observations	373	367	367	373	367	367
Groups	15	15	15	15	15	15
R <sup>2</sup> within	0.0000036	0.0927	0.101	0.00534	0.0984	0.107
R <sup>2</sup> between	0.0781	0.845	0.807	0.642	0.858	0.827
R <sup>2</sup> overall	0.0000565	0.119	0.123	0.00837	0.126	0.130

Dependent variable: Increase in MP salaries (growth rate). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 3.6: OLS regression results with continuous time variable (II)

	(1)	(2)	(3)	(4)	(5)	(6)
Share of legislative period passed	-0.00389 (0.00653)	-0.00412 (0.00682)	-0.00433 (0.00694)	0.0385 (0.0244)	0.0480 (0.0296)	0.0477 (0.0293)
Share of legislative period passed (sq.)				-0.0430 (0.0286)	-0.0528 (0.0345)	-0.0527 (0.0344)
Increase in employee salaries ( $t-1$ )		0.365*** (0.0885)	0.356*** (0.0904)		0.368*** (0.0918)	0.357*** (0.0933)
Deficit ratio ( $t-1$ )		-0.0612 (0.0579)	-0.0613 (0.0574)		-0.0632 (0.0583)	-0.0628 (0.0581)
Government ideology			-0.00142 (0.00427)			-0.00187 (0.00447)
Seat share government			-0.0195 (0.0174)			-0.0186 (0.0163)
Constant	0.0156 (0.0108)	0.00739 (0.00991)	0.0213 (0.0141)	0.00623 (0.0144)	-0.00416 (0.0148)	0.00949 (0.0148)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	373	367	367	373	367	367
Groups	15	15	15	15	15	15
R <sup>2</sup> within	0.179	0.243	0.244	0.185	0.252	0.254
R <sup>2</sup> between	0.0289	0.797	0.788	0.00341	0.810	0.805
R <sup>2</sup> overall	0.153	0.258	0.259	0.162	0.269	0.270

Dependent variable: Increase in MP salaries (growth rate). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*\*\*  $p < 0.01$ .

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**Table 3.7: OLS regression results including indexed years**

	(1)	(2)	(3)	(4)	(5)	(6)
Post-election period	-0.00162 (0.00423)	-0.00225 (0.00451)				
Pre-election period	-0.00176 (0.00586)	-0.00407 (0.00615)				
Share of legislative period passed			0.000783 (0.00546)	-0.000347 (0.00464)	0.0250 (0.0144)	0.0259 (0.0167)
Share of legislative period passed (sq.)					-0.0241 (0.0157)	-0.0262 (0.0194)
Increase in employee salaries ( $t-1$ )	0.268*** (0.0686)	0.317** (0.112)	0.270*** (0.0675)	0.317** (0.111)	0.266*** (0.0681)	0.317** (0.113)
Deficit ( $t-1$ )	-0.0417 (0.0511)	-0.0493 (0.0557)	-0.0425 (0.0503)	-0.0493 (0.0554)	-0.0432 (0.0512)	-0.0497 (0.0555)
Government ideology	0.000368 (0.00323)	-0.00120 (0.00338)	0.000442 (0.00322)	-0.00109 (0.00332)	-0.000041 (0.00338)	-0.00160 (0.00348)
Seat share government	-0.0154 (0.00970)	-0.0160 (0.0124)	-0.0148 (0.00946)	-0.0154 (0.0123)	-0.0150 (0.00946)	-0.0156 (0.0125)
Increase in federal MP salaries ( $t-1$ )	0.106 (0.0704)		0.104 (0.0750)		0.105 (0.0744)	
Constant	0.0227*** (0.00728)	0.0164 (0.00969)	0.0214*** (0.00717)	0.0153 (0.00963)	0.0177** (0.00603)	0.0115 (0.00959)
Time-fixed effects	-	Yes	-	Yes	-	Yes
Observations	478	478	478	478	478	478
Groups	16	16	16	16	16	16
R <sup>2</sup> within	0.0919	0.215	0.0914	0.213	0.0948	0.217
R <sup>2</sup> between	0.464	0.346	0.436	0.349	0.432	0.355
R <sup>2</sup> overall	0.0986	0.215	0.0975	0.213	0.102	0.217

Dependent variable: Increase in MP salaries (growth rate). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 3.8: OLS regression results for indexed years

	(1)	(2)	(3)	(4)	(5)	(6)
Post-election period	0.00423 (0.00808)	0.00313 (0.00618)				
Pre-election period	0.00473 (0.00768)	0.00603 (0.00567)				
Share of legislative period passed			0.00258 (0.00478)	0.00593 (0.00459)	0.00231 (0.0148)	-0.000507 (0.0191)
Share of legislative period passed (sq.)					0.000246 (0.0147)	0.00597 (0.0165)
Increase in employee salaries ( $t-1$ )	0.0106 (0.0428)	0.467 (0.544)	0.00255 (0.0363)	0.545 (0.552)	0.00257 (0.0368)	0.526 (0.536)
Deficit ( $t-1$ )	-0.0375 (0.108)	-0.202 (0.150)	-0.00947 (0.0797)	-0.172 (0.145)	-0.00941 (0.0788)	-0.177 (0.152)
Government ideology	0.00693 (0.00397)	0.00921 (0.00659)	0.00571** (0.00245)	0.00742 (0.00483)	0.00573 (0.00323)	0.00815 (0.00588)
Seat share government	0.0119 (0.0103)	0.0101 (0.00988)	0.00611 (0.0151)	0.00193 (0.0140)	0.00611 (0.0152)	0.00124 (0.0141)
Increase in federal MP salaries ( $t-1$ )	-0.00238 (0.0389)		0.0120 (0.0407)		0.0120 (0.0409)	
Constant	0.00879 (0.00662)	-0.0116 (0.0175)	0.0125* (0.00686)	-0.00869 (0.0159)	0.0125 (0.00790)	-0.00729 (0.0150)
Time-fixed effects	-	Yes	-	Yes	-	Yes
Observations	111	111	111	111	111	111
Groups	12	12	12	12	12	12
R <sup>2</sup> within	0.0188	0.280	0.00936	0.276	0.00936	0.276
R <sup>2</sup> between	0.0301	0.000415	0.0356	0.00863	0.0368	0.00209
R <sup>2</sup> overall	0.0209	0.258	0.0120	0.248	0.0120	0.251

Dependent variable: Increase in MP salaries (growth rate). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ .



## Electoral cycles in MPs' salaries

## 4 Do left-wing governments decrease income inequality? Empirical evidence based on salaries of civil servants

### Abstract\*

We investigate whether left-wing governments decrease income inequality. The data is based on salaries of German civil servants. Since a reform in 2006, German state governments are allowed to design salaries of civil servants. We employ encompassing data for pay levels and professions including judges, professors, policemen, and administrators and distinguish between levels of operating experiences. We use five income inequality measures comparing salaries across pay levels and operating experiences. The results do not suggest that left-wing governments were more active in decreasing income inequality than center or right-wing governments. Cabinet members are civil servants themselves and decide on their own salaries: government ideology is also not shown to predict salaries of cabinet members. Because left-wing governments are perceived as taking action against income inequality, future research should employ data from other federal states such as the United States to examine how government ideology influences salaries of civil servants.

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### 4.1 Introduction

Income inequality has decreased across countries but is still pronounced within many countries. Scholars examine what influences income inequality across and within countries. A prominent example is globalization (Dreher and Gaston 2008, Bergh and Nilsson 2010, Dorn et al. 2017, Lang and Tavares 2018). Clearly, domestic governments have a hard time to prevent globalization influencing income inequality, especially when they wish to enjoy benefits of globalization and do not protect their economies from trade and foreign investment flows. Domestic governments may well, however, respond to globalization and its effects on income inequality by implementing policies such as increasing social expenditure, regulating labor markets, and increasing taxes for high-income citizens. The extent to which domestic governments wish to address income inequality and be active in income redistribution is likely to depend on government ideology. Left-wing governments are expected to be more active in income redistribution to decrease income inequality than right-wing governments. Empirical evidence shows that top income shares increased under right-wing governments more rapidly than under left-wing governments (Scheve and Stavasage 2009, Dorn and Schinke 2018). The previous studies examining how government ideology influences income inequality used panel data for OECD countries and univariate times series for individual OECD countries.

We examine how government ideology influences within-country income inequality. We employ new data on civil servants' salaries that encompass variation across pay levels and operating experiences. The sample includes salaries of all civil servants in the German states: judges, professors, policemen, administrators etc. We elaborate on a reform of the German fiscal constitution in 2006: the reform allowed German state governments to design salaries of civil servants. The results do not suggest that left-wing governments were more active in decreasing income inequality among civil servants than center or right-wing governments.

### 4.2 Background and hypothesis

#### 4.2.1 Government ideology and income redistribution

Left-wing governments are expected to increase the size and scope of governments and, in turn, to decrease income inequality. The partisan theories describe that both left-wing and right-wing governments gratify the needs of their constituencies (Hibbs 1977, Chappell and Keech 1986, Alesina 1987). Blue-collar workers, low-income, and low-skilled citizens have been the constituency of left-wing parties, and self-employed, high-income, and high-skilled citizens have been the constituency of right-wing parties for a long time. The partisan theories modelled the economy by a Phillips curve tradeoff: politicians use fiscal and monetary policies to choose between unemployment and inflation. Left-wing governments that cater the interests of low-income citizens will implement expansionary fiscal and monetary policies to keep unemployment low (and accept inflation). Right-wing governments cater the interests

## Do left-wing governments decrease income inequality?

of high-income citizens; they will implement restrictive fiscal and monetary policies to keep inflation at low rates (and accept unemployment).

The partisan theories have been translated to many economic policy fields; the core hypothesis to be investigated being that left-wing governments increase the size and scope of government which includes income redistribution from high-income to low-income citizens (for surveys see Schmidt 1996, Potrafke 2017, Zohlnhöfer et al. 2018). Governments have manifold measures at hand to redistribute income from high-income to low-income citizens. An important measure is to tax high-income citizens to a large extent. Taxing high-income citizens incorporates progressive income taxation. Marginal tax rates should be much higher for high than for low incomes, and governments may well grant generous tax-exempt amounts for low incomes. Because high-income citizens often enjoy pronounced capital incomes, governments advocating income redistribution are likely to tax capital more progressively than labor. Low-income citizens usually spend a large amount of their income for consumption. One would therefore expect that left-wing governments are less active in increasing consumption tax rates than right-wing governments. Empirical evidence for OECD countries tends to confirm ideology-induced tax policies (e.g., Angelopoulos et al. 2012, Osterloh and Debus 2012).

Income redistribution also includes generous transfers to low-income citizens. A prominent example is social policies. Left-wing governments may want to promote social insurance against risks such as illness, old age, and unemployment to attract poorer voters and voters with larger health risks (De Donder and Hindriks 2007). Encompassing social insurance gives rise to increasing social expenditure. Scholars have examined how government ideology influences social expenditure. The empirical evidence for OECD countries suggests that social expenditure was higher under left-wing governments until the end of the 1980s; government ideology retired to the background in the 1990s and early 2000s. New studies report ideology-induced social policies, the fields of social policy (health, old age, active labor market policies etc.) notwithstanding.<sup>1</sup>

Pronounced social spending and progressive taxation under left-wing governments accompanied decreasing income inequality. The studies by Scheve and Stavasage (2009) and Dorn and Schinke (2018) show that top income shares were higher under right-wing than under left-wing governments.<sup>2</sup> The governments of Margaret Thatcher in the United Kingdom and Ronald Reagan in the United States were prime examples for market-oriented policies in the 1980s. The policies included deregulation of labor and product markets, privatizations of state-owned companies and cutting social expenditure and tax reliefs especially for high-income citizens. The top one percent income share started to drastically increase when

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<sup>1</sup> See, for example, Potrafke (2009 and 2017), Bove et al. (2017), Herwartz and Theilen (2017), Savage (2018), and Schuknecht and Zemanek (2018).

<sup>2</sup> See Bjørnskov (2008) on the nexus between government ideology, income inequality, and economic growth in developing countries.

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Thatcher and Reagan came into power. After the 1980s, however, government ideology was not related with top income shares in Anglo-Saxon countries, but in many other OECD countries.

We expect left-wing governments to be more active in reducing income inequality than center and right-wing governments.

### 4.2.2 Ideology-induced policies in the German states

Examining ideology-induced income redistribution – especially within countries – requires some more fine-grained data than previous studies used. We focus on the German states in which government ideology has been shown to influence economic policies.

German state governments have room to maneuver in individual policy fields such as education and cultural policies. Right-wing governments spent more on universities and somewhat less on primary schools and were more active in introducing tuition fees than left-wing governments (Oberndorfer and Steiner 2007, Potrafke 2011, Kauder and Potrafke 2013). Law and order policies were influenced by government ideology: right-wing governments hired more policemen and used dragnet-controls – controls of persons conducted by the police without having any suspicion that the controlled person committed a crime – more often than left-wing governments (Tepe and Vanhuysse 2013, Potrafke 2018). German state governments have hardly any means in designing tax policies. An exception is the real-estate transfer tax: the fiscal constitution was reformed in 2006 and allowed state governments to set real-estate transfer tax rates. Empirical evidence shows that left-wing and center governments were more active in increasing the real-estate transfer tax rates than right-wing governments (Krause and Potrafke 2017 – see Chapter 5). Left-wing governments that increase real-estate transfer tax rates may well be inclined to redistribute income from high-income to low-income citizens because high-income citizens are more likely to buy properties than low-income citizens and, in turn, pay real-estate transfer taxes.

Left-wing governments may well use salaries of public employees to redistribute incomes: salaries of low-skilled public employees are expected to increase to a larger extent than salaries of high-skilled public employees. Especially well-paid public employees are judges and cabinet members of state governments (in Germany, all of them are civil servants and enjoy also other benefits such as entitlements to a pension). Many well-paid public employees receive high salaries in old age, when retirement is close. A reason is experience and networking that are required for job promotion. Another reason is that salaries of public employees mechanically increase – without any job promotion – over time. The German law rewards operating experience. Low-paid public employees do services in the administration such as errands. Clearly, many low-paid public employees are young and therefore receive quite low salaries because they are both grouped into a low pay level and do not have much operating experience yet. It is conceivable that low-paid public employees are likely to vote for left-wing par-

ties that may want to increase entry-level salaries. In a similar vein, well-paid public employees are likely to vote for right-wing parties that are, in turn, inclined to further reward well-paid public employees.

State governments have many means to influence income redistribution among public employees. First, governments design the vertical distribution of pay levels by changing, for example, the relation between salaries of a judge in a local court and a chief judge in the supreme court. Second, governments design the horizontal distribution of pay levels by changing, for example, the relation between salaries of a judge in a local court with 2 and 30 years of operating experience.

We expect left-wing governments to compress the distribution of salaries of public employees more than right-wing governments. We also expect left-wing governments to increase entry-level salaries more than top salaries.

### 4.3 Institutional backdrop

#### 4.3.1 Salaries of civil servants

In September 2006, a large reform of German federalism took effect. One of the key elements of the reform was the decision that state parliaments are allowed to set salaries of their civil servants. Before the reform, the salaries of all German civil servants were decided on at the federal level. The first state that set its own salaries was Bavaria in 2007. Most other states followed in 2008.

In all states, civil servants are paid based on five pay-level groups (see Table 4.1). Most civil servants are paid on the A-level, upper-level civil servants on the B-level, professors on the C- and the W-level, and judges and prosecutors on the R-level. Within each of these groups there are different individual pay levels. For example, A-level civil servants are paid a salary on the levels A2 to A16 and R-level civil servants on the levels R1 to R10. Within each of these pay levels, there are in turn different levels of operating experience. C-level civil servants, for example, are categorized into up to 15 different levels of operating experience.

#### 4.3.2 The German political party landscape

Two major political parties have characterized the political landscape in Germany: the leftist Social Democratic Party (SPD) and the conservative Christian Democratic Union (CDU; in Bavaria CSU). All federal chancellors and state prime ministers – except the green prime minister of Baden-Wuerttemberg elected in 2011 and the prime minister of Thuringia from the Left Party elected in 2014 – were members of one of these two parties, SPD and CDU. We can therefore test for ideology-induced policy-making on a left-right scale.

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The Free Democratic Party (FDP) and the Greens (Bündnis 90/Die Grünen) – both much smaller – have played an important role as coalition partners in the West German states, the Left Party (Die Linke) as coalition partner in the East German states.

### 4.4 Empirical analysis

#### 4.4.1 Empirical strategy

State governments decide on increasing salaries of civil servants quite erratically, at seemingly arbitrary points in time. Only in some cases, state governments increase salaries regularly year after year. State governments also often decide on multiple salary increases at the same time. Many decisions include, for example, an increase with retroactive effect from the beginning of the current year, and two increases effective from the beginning of the next year and the beginning of the year after the next year. This erratic pattern makes it infeasible to estimate panel data models using annual data on salary increases. Following Schmitt (2015), we thus condense our data and examine legislative periods.

The baseline panel-data model has the following form:

$$\begin{aligned} \text{Change in measure of salaries}_{i,t} = & \beta \text{Government ideology}_{i,t} + \gamma \text{Seat share government}_{i,t} \\ & + \delta \text{Increase in employee salaries}_{i,t} + \varepsilon \text{Increase in Gini of employee salaries}_{i,t} \\ & + \zeta \text{Increase in debt/GDP}_{i,t} + \theta \text{Increase in civil servants p.c.}_{i,t} \\ & + \varphi \text{Change in measure of salaries (federal)}_{i,t} + \eta_i + \tau_t + u_{i,t} \end{aligned}$$

with  $i = 1, \dots, 16$ ;  $t = 2007, \dots, 2017$  (median year of legislative period; unbalanced)

where *Change in measure of salaries*<sub>*i,t*</sub> describes five measures of average annual growth in inequality and two different measures of nominal salaries' growth in state *i* in the legislative period with median year *t*. Table 4.1 shows one of the 225 salary scales in our data set as an example. We use all salary scales passed by an individual government to calculate the growth or growth in inequality per year of a legislative period. The individual rows show different pay levels, and the individual columns show different levels of operating experience. *Increase in diagonal inequality*<sub>*i,t*</sub> is a cross-section type of inequality measure and describes the growth rate of the relation between the highest and the lowest salary in a salary scale. *Increase in vertical inequality*<sub>*i,t*</sub> describes the growth rate of the relation between the highest and the lowest salary among those civil servants that have reached the highest level of operating experience (technically speaking: the growth rate of the relation between the highest and the lowest row maximum). It is thus an individual-specific measure of inequality, because all civil servants will basically reach the highest level of operating experience at some time. *Increase in horizontal inequality*<sub>*i,t*</sub> first calculates the relation between the salaries of the highest and of the lowest level of operating experience for every individual pay level, and then calculates the average of the resulting relations. The measure thus describes the extent to which experience

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is remunerated. *Increase in horizontal inequality (weighted)*<sub>*i,t*</sub> follows the same idea, does however weight the individual pay scales according to the number of civil servants in these pay scales.<sup>3</sup> *Increase in Gini coefficient*<sub>*i,t*</sub> describes how the Gini coefficient of salaries has increased. Information on the number of civil servants in the individual levels of operating experience is not available. The measure thus assumes that all civil servants have reached the highest level of operating experience, and again uses weights for the number of civil servants in the individual pay scales. *Average growth*<sub>*i,t*</sub> describes the average of the growth rates of the mean salaries in the individual pay scales (note that calculating growth rates of all cells in the salary scale individually is not feasible, because the number of levels of operating experience changes quite often). *Average growth (weighted)*<sub>*i,t*</sub> alters this measure by using weights of the number of civil servants in the individual pay scales when calculating the average.

The variable *Government ideology*<sub>*i,t*</sub> measures ideology-induced policy-making and takes on the value 1 when a left-wing government is in office, the value 0.5 for a center government, and the value 0 for a right-wing government (e.g., Kauder and Potrafke 2013, Potrafke et al. 2016). In alternative specifications, we also use dummy variables for left-wing, center, and right-wing governments, because the government ideology index assumes a linear relationship between the individual types of governments. We expect that left-wing governments decrease inequality. The effect of government ideology on the growth of salaries is however not clear. Left-wing governments prefer a larger size of government than do right-wing governments and should thus increase salaries more. Some civil servants, such as judges, are however not core constituencies of left-wing governments and should thus not be expected to enjoy large increases in salaries. It is conceivable that politicians increase salaries for civil servants more when their party holds a large majority of seats in parliament (see Benito et al. 2014, Svaleryd and Vlachos 2009). *Seat share government*<sub>*i,t*</sub> thus measures the number of seats the governing parties have relative to all seats in parliament.

We include five control variables that we measure with a lag of one year. For example, if a legislative period lasts from March 2011 through March 2016, we consider the control variable in the period from March 2010 through March 2015.<sup>4</sup> All these variables are calculated as per year of the legislative period's length. *l.Increase in employee salaries*<sub>*i,t*</sub> measures the extent to which nominal salaries of public- and private-sector employees increased in a state (see also Di Tella and Fisman 2004). We expect the salaries of private- and public-sector employees to be positively correlated with salaries of civil servants. The effect on inequality is however theoretically ambiguous. *l.Increase in Gini of employee salaries*<sub>*i,t*</sub> describes the increase in the Gini

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<sup>3</sup> Data on the number of civil servants in individual pay scales is only available from 2011 through 2016. We thus use the 2011 weights also for all years before 2011, and the 2016 weights also for 2017 and 2018. Weights are identical over all states, also because of data availability.

<sup>4</sup> In this example, the year 2010 enters the calculation with a weight of 9.5/12 (months), and the year 2015 with a weight of 2.5/12 (months), if the legislative period ends and begins in the middle of March. The years 2011–2014 enter with a full weight of 12/12.



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coefficient of private- and public-sector employees in a state. Here we expect a positive correlation with inequality of civil servants' salaries, whereas the correlation with the growth of salaries is unclear. The variable *l.Increase in debt/GDP<sub>i,t</sub>* measures how public debt in a state has increased relative to state's GDP. We expect this variable to be negatively correlated with salaries of civil servants because state governments are unlikely to increase salaries of civil servants when public debt is increasing. *l.Increase in civil servants p.c.<sub>i,t</sub>* measures the extent to which the number of state civil servants per capita has increased. The correlation with our dependent variables is theoretically ambiguous.<sup>5</sup> Finally, we include the dependent variables as measured for salaries of civil servants on the federal level (e.g., the increase in the Gini coefficient of federal civil servants), which may serve as a benchmark for state policy-makers when deciding on the salaries of state civil servants.  $\eta_i$  is a fixed state effect;  $\tau_t$  is a fixed time effect (based on the median year of a legislative period; reference category: 2007);  $u_{i,t}$  is the error term. We estimate the fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors; see Huber 1967, White 1980).

### 4.4.2 Descriptive statistics

Figure 4.1 shows the means of our dependent variables separately for left-wing, center, and right-wing governments. The upper two panels show that in legislative periods with a right-wing government, diagonal and vertical inequality decreased by about 1.6 percent per year. Under left-wing and center governments, by contrast, diagonal and vertical inequality decreased by only about half a percent per year. Horizontal inequality, measuring how much experience is remunerated, and the Gini coefficient show only values smaller than one percent for left-wing, center, and right-wing governments. The average growth rates of salaries hardly differ between left-wing, center, and right-wing governments. For all types of governments, growth rates are on average about 2.5 to 3 percent. Table 4.2 shows descriptive statistics. Table 4.3 contains the correlation coefficients between our main variables. The bottom row indicates that left-wing governments were more active in increasing diagonal and vertical inequality, and less active in increasing horizontal inequality, and insofar corroborates the evidence from Figure 4.1. Our data set includes 50 observations.<sup>6</sup>

### 4.4.3 Regression results

Table 4.4 shows the regression results of the baseline model when fixed state but no fixed time effects are included. The variable *Government ideology* does not turn out to be statistically significant in Columns (2) to (7), it is statistically significant at the 10 percent level with an unexpected positive sign in Column (1). The coefficient estimate of the variable *Government*

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<sup>5</sup> Data on the number of civil servants in the individual states is only available until 2016. We thus use the value for 2016 also for 2017.

<sup>6</sup> Note that there is one legislative period in the data set without a decision on salaries (Saarland 2009–2012). We code the date of decision of this non-increase as the exact middle of the legislative period. We also included legislative periods that have started, but not yet ended until the end of our data set (February 2018), when either a decision on salaries has already taken place or the period was running for at least one year.

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*ideology* indicates that the growth rate in diagonal civil servant salary inequality increased by around 0.9 percentage points when the government ideology variable increased by one point, that is from a right-wing to a left-wing government.

Some of the control variables help to predict increases in inequality of civil servants' salaries and are statistically significant. Increases in the Gini of employee salaries are, for example, positively correlated with increases in horizontal inequality of civil servants' salaries (Columns 3 and 4). Increases in horizontal inequality of civil servants' salaries at the federal level are positively correlated with increases in horizontal inequality of civil servants' salaries at the state level (Column 3). The average weighted growth of salaries at the federal level is also positively correlated with the average weighted growth of salaries at the state level (Column 7).

When we include fixed time effects (Table 4.5), the point estimate of the variable *Government ideology* in Column (1) remains positive but lacks statistical significance. By contrast, the point estimate of the variable *Government ideology* in Column (3) renders to be statistically significant at the 5 percent level indicating that the growth rate in horizontal inequality of civil servants' salaries decreased by around 0.3 percentage points when the government ideology variable increased by one point, that is from a right-wing to a left-wing government. The estimate of the variable *Government ideology* in Column (4) does however not suggest that the growth rate in horizontal inequality of civil servants' salaries decreased under left-wing governments once we weight the individual pay scales according to the number of civil servants in these pay scales. In fact, it slightly fails to be statistically significant at the 10 percent level.

Table 4.6 shows the results when we include dummy variables for left-wing and center governments (reference category: right-wing governments), to allow for a non-linear relationship between the individual types of government ideology. Inferences do not change compared to Table 4.5. The dummy variable *Ideology left* is only statistically significant at the 10 percent level when *Increase in horizontal inequality* is the dependent variable. The dummy variable *Ideology center* does not turn out to be statistically significant in any specification.

### 4.4.4 Robustness tests

We submitted our results to rigorous robustness tests using different specifications of our regressions and different samples. None of these robustness tests indicates any severe fragility in our results.

Ideology-induced policy-making has been shown to differ between East and West German states (see, for example, Potrafke 2013 and Kauder et al. 2017). When replicating Table 4.5 for West German states only, the results do not show that government ideology influenced any of our dependent variables, except for the increase in horizontal inequality (negative and statistically significant at the 10 percent level). Running the model only for East German states is not meaningful because of only 15 observations.

## Do left-wing governments decrease income inequality?

We tested whether inferences differ across individual pay-level groups (A, B, C, R, and W) by again replicating Table 4.5. In pay-level group A (including most civil servants), the variable *Government ideology* shows a positive and statistically significant effect for the weighted increase in horizontal inequality. In pay-level group C (including professors), government ideology is positively associated with the variable *Average growth* (statistically significant at the 10 percent level). For the other dependent variables and pay-level groups, government ideology does not turn out to be statistically significant.

In the baseline model, all dependent variables are calculated as per year of the legislative period's length. Replicating Table 4.5, inferences hardly change when we calculate the dependent variables as per year of how long increases are valid: the effect of government ideology is positive and now statistically significant at the 10 percent level when *Average growth* is the dependent variable.

### 4.5 Salaries of cabinet members

Why is it that left-wing governments are not shown to be more active in decreasing inequality of civil servants than center and right-wing governments? It is conceivable that they have self-interests because all cabinet members are employed as (temporary) civil servants themselves.<sup>7</sup> Cabinet members receive B10 or B11 salaries (the highest B pay level) plus a percentage premium on top of B10 or B11. The percentage premia are decided by the state parliament in which the parties of the state governments have a majority.<sup>8</sup> Table 4.7 shows that there is quite some variation in the percentage premia across the German states. In 2017, for example, the percentage premium in Bremen was actually zero – the only German state which did not grant any premium. In North Rhine-Westphalia, the premium was 33 percent for the prime minister. Table 4.7 shows however also that there is hardly any variation within states. Only in few cases, governments increased or decreased the percentage premium for prime ministers or ministers between 2007 and 2017. Decreases occurred under a right-wing government in Hesse, a left-wing government in Rhineland-Palatinate, a center government in Schleswig-Holstein, and a right-wing government in Thuringia. A center government in Thuringia increased salaries of cabinet members. This case study evidence does not suggest that government ideology influenced salaries of cabinet members.

We have also estimated our baseline model excluding the pay levels B10 and B11, and the entire B-level. Inferences regarding the effects of government ideology do not change.

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<sup>7</sup> On electoral cycles in salaries of US federal bureaucrats and German state members of parliament see Borjas (1984) and Kauder et al. (2018) – see Chapter 3.

<sup>8</sup> There is only one minority government in our sample (North Rhine-Westphalia 2010–2012). To be sure, formally there were further minority governments, which however existed only for quite short periods, after coalition governments failed and new elections were called.

## 4.6 Conclusion

Left-wing governments favor a large size and scope of government and wish to redistribute income from high-income to low-income citizens. Empirical studies have shown that income redistribution was indeed correlated with government ideology in OECD countries (Scheve and Stavasage 2009, Dorn and Schinke 2018): top income shares increased under right-wing governments. Previous studies ignored, however, income inequality within countries by exploiting, for example, variation across regions or federal states.

We compiled measures of inequality in salaries of civil servants in Germany. State governments design salaries of civil servants since 2007 and decide on how to reward individual professions such as judges, professors, policemen, and administrators. Our results do not suggest that left-wing governments were more active in reducing income inequality among civil servants than center or right-wing governments. Clearly, civil servants in the German states are unlikely to suffer from poverty. Left-wing governments which would like to redistribute income from rich to poor citizens may therefore put more emphasis on designing policies that attract other citizens than civil servants. In any event, differences among low and high salaries of civil servants are drastic, and left-wing governments have certainly a chance to decrease income inequality by designing salaries of civil servants.

A delicate issue is that cabinet members are (temporary) civil servants themselves and cabinet members de facto determine their own salaries. We have therefore examined salaries of cabinet members investigating whether left-wing governments are more active in decreasing their own salaries than right-wing governments: government ideology is also not shown to predict salaries of cabinet members. We cannot tell anything on how individual cabinet members spend their salaries. It is possible that left-wing cabinet members do not advocate to decrease their own salaries because they wish to donate money for charity.

The absence of evidence showing that left-wing governments decreased income inequality among German civil servants is, of course, not to be generalized among other countries. Future research should therefore employ data from other federal states such as the United States to examine how government ideology influences salaries of civil servants. Against the background of quite polarized political parties and voters in the United States, Democratic state governments may well be more active in decreasing income inequality among civil servants than Republican state governments.

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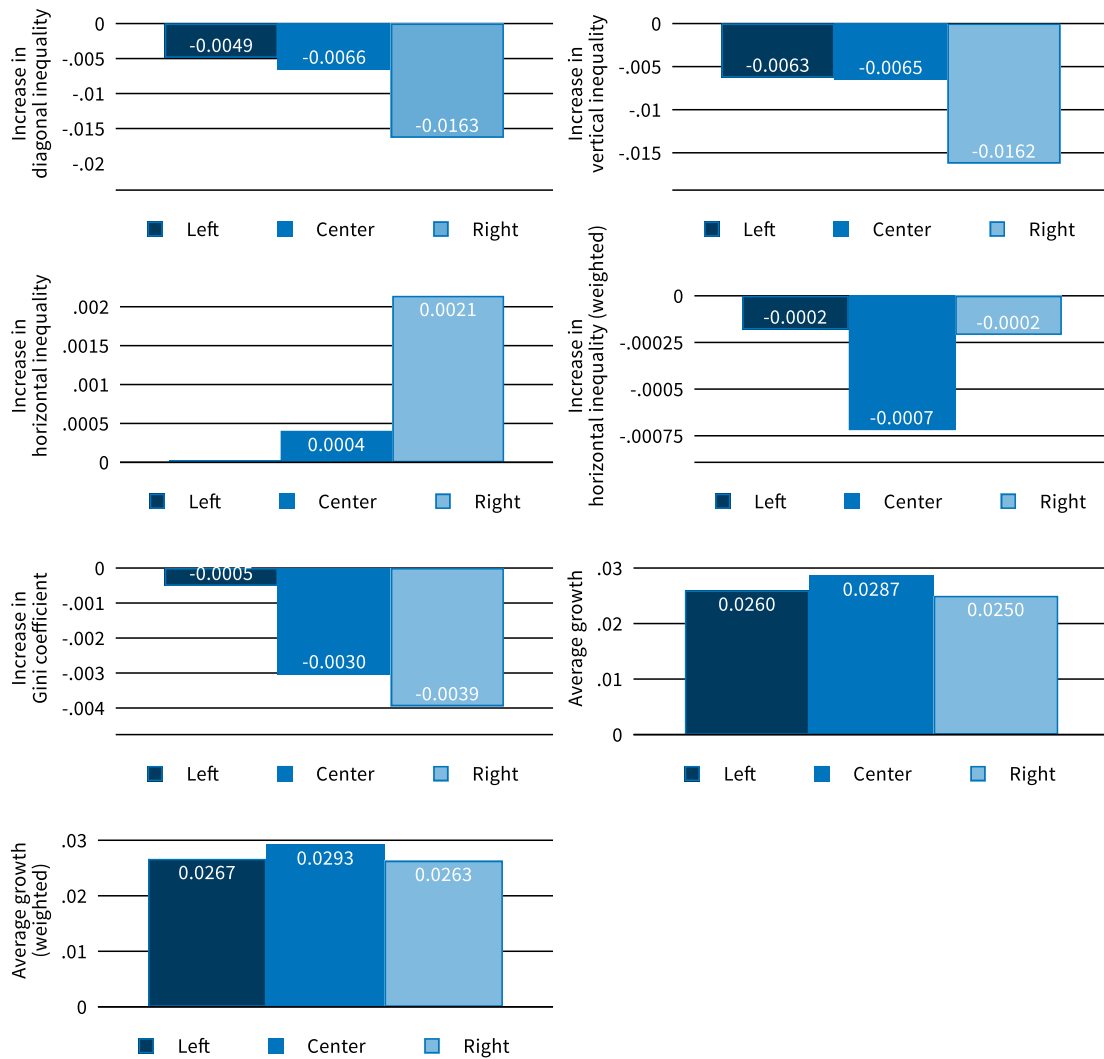
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## Appendix

Figure 4.1: Increases in inequality of civil servants' salaries by type of government



Source: own illustration.



## Do left-wing governments decrease income inequality?

**Table 4.1: Example of a salary scale, North Rhine-Westphalia 2012**

Pay level	Operating experience															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A 2	1674.41	1713.91	1753.43	1792.93	1832.43	1871.97	1911.48									
A 3	1742.65	1784.69	1826.71	1868.75	1910.80	1952.85	1994.89									
A 4	1781.35	1830.86	1880.32	1929.84	1979.33	2028.82	2078.29									
A 5	1795.43	1858.80	1908.05	1957.27	2006.52	2055.75	2105.00	2154.25								
A 6	1837.04	1891.10	1945.16	1999.23	2053.29	2107.37	2161.43	2215.50	2269.55							
A 7	1916.07	1964.67	2032.69	2100.72	2168.76	2236.78	2304.83	2353.39	2401.99	2450.60						
A 8		2033.70	2091.82	2178.99	2266.19	2353.35	2440.57	2498.68	2556.79	2614.93	2673.04					
A 9		2164.21	2221.39	2314.44	2407.49	2500.54	2593.59	2657.54	2721.54	2785.49	2849.46					
A 10		2328.95	2408.43	2527.62	2646.86	2766.08	2885.30	2964.77	3044.25	3123.72	3203.19					
A 11			2678.78	2800.93	2923.09	3045.25	3167.41	3248.84	3330.28	3411.73	3493.17	3574.61				
A 12			2878.00	3023.64	3169.28	3314.92	3460.55	3557.64	3654.74	3751.83	3848.93	3946.01				
A 13			3234.59	3391.86	3549.14	3706.40	3863.66	3968.51	4073.35	4178.20	4283.06	4387.91				
A 14			3364.87	3568.85	3772.78	3976.72	4180.64	4316.60	4452.57	4588.53	4724.49	4860.46				
A 15						4369.26	4593.48	4772.86	4952.23	5131.63	5311.01	5490.39				
A 16						4821.68	5080.98	5288.47	5495.93	5703.37	5910.85	6118.30				
B 1	5490.39															
B 2	6380.77															
B 3	6757.72															
B 4	7152.52															
B 5	7605.46															
B 6	8033.20															
B 7	8449.27															
B 8	8882.92															
B 9	9421.37															
B 10	11093.46															
B 11	11524.40															
C 1	3024.89	3129.76	3234.59	3339.43	3444.30	3549.14	3653.98	3758.82	3863.66	3968.28	4073.35	4178.20	4294.16	4387.91		
C 2	3031.44	3198.53	3365.62	3532.73	3699.81	3866.90	4034.00	4201.08	4368.16	4535.27	4702.34	4869.43	5036.52	5203.62	5370.71	
C 3	3334.22	3523.41	3712.62	3901.82	4091.01	4280.21	4469.40	4658.58	4847.78	5036.97	5226.16	5415.37	5604.54	5793.75	5982.93	
C 4	4224.92	4415.11	4605.29	4795.48	4985.67	5175.85	5366.07	5556.22	5746.41	5936.60	6126.80	6316.97	6507.16	6697.34	6887.53	
R 1	3470.86	3628.14	3710.94	3924.50	4138.09	4351.64	4565.21	4778.81	4992.37	5205.94	5419.50	5633.11				
R 2			4222.18	4435.75	4649.31	4862.91	5076.49	5290.04	5503.62	5717.18	5930.77	6144.30				
R 3	6757.72															
R 4	7152.52															
R 5	7605.46															
R 6	8033.20															
R 7	8449.27															
R 8	8882.92															
R 9	9421.37															
R 10	11570.14															
W 1	3816.31															
W 2	4354.02															
W 3	5278.75															

Note: monthly gross salaries in euro. Source: own illustration.

## Do left-wing governments decrease income inequality?

**Table 4.2: Descriptive statistics**

	Obs.	Mean	Std. Dev.	Min	Max
Increase in diagonal inequality	50	-0.009	0.013	-0.062	0.008
Increase in vertical inequality	50	-0.009	0.014	-0.062	0.008
Increase in horizontal inequality	50	0.001	0.003	-0.003	0.015
Increase in horizontal inequality (weighted)	50	-0.000	0.001	-0.005	0.002
Increase in Gini coefficient	50	-0.002	0.007	-0.030	0.015
Average growth	50	0.027	0.012	0.000	0.064
Average growth (weighted)	50	0.027	0.013	0.000	0.068
Government ideology	50	0.540	0.402	0.000	1.000
Ideology left	50	0.360	0.485	0.000	1.000
Ideology center	50	0.360	0.485	0.000	1.000
Ideology right	50	0.280	0.454	0.000	1.000
Seat share government	50	0.574	0.079	0.382	0.855
l.Increase in employee salaries	50	0.022	0.009	0.008	0.039
l.Increase in Gini of employee salaries	50	0.004	0.027	-0.073	0.100
l.Increase in debt/GDP	50	0.001	0.052	-0.081	0.246
l.Increase in civil servants p.c.	50	0.000	0.011	-0.019	0.024
l.Increase in diagonal inequality federal	50	-0.008	0.014	-0.045	0.015
l.Increase in vertical inequality federal	50	-0.007	0.014	-0.044	0.015
l.Increase in horizontal inequality federal	50	-0.003	0.006	-0.018	0.001
l.Increase in horizontal inequality federal (weighted)	50	-0.005	0.006	-0.018	0.000
l.Increase in Gini coefficient federal	50	0.013	0.017	-0.002	0.053
l.Average growth federal	50	0.028	0.012	0.000	0.050
l.Average growth federal (weighted)	50	0.030	0.012	0.000	0.053

Note: We define variables in Section 4.4.1.

Sources: state law gazettes (salaries of state civil servants and decision dates), federal law gazettes (salaries of federal civil servants and decision dates), state statistical offices (employee salaries, debt, GDP), federal statistical office (number of civil servants (in different pay scales), employee salaries), Kauder et al. (2018) (government ideology), state election administrators (seat share government), German Socio-Economic Panel (Gini of employee salaries).

Table 4.3: Correlation between the main variables

	Increase in diagonal inequality	Increase in vertical inequality	Increase in horizontal inequality	Increase in horizontal inequality (weighted)	Increase in Gini coefficient	Average growth	Average growth (weighted)	Government ideology
Increase in diagonal inequality	1							
Increase in vertical inequality	0.969***	1						
Increase in horizontal inequality	-0.573***	-0.537***	1					
Increase in horizontal inequality (weighted)	0.203	0.208	0.362***	1				
Increase in Gini coefficient	0.718***	0.666***	-0.488***	0.127	1			
Average growth	-0.256*	-0.229	0.192	-0.205	-0.317**	1		
Average growth (weighted)	-0.269*	-0.239*	0.196	-0.211	-0.338**	0.994***	1	
Government ideology	0.342**	0.278*	-0.301**	0.024	0.211	0.022	0.003	1

Note: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . We define variables in Section 4.4.1.

## Do left-wing governments decrease income inequality?

**Table 4.4: OLS regression results with categorical government ideology variable (I)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Increase in diagonal inequal- ity	Increase in vertical inequal- ity	Increase in hori- zontal inequal- ity	Increase in horizon- tal ine- quality (weighted)	Increase in Gini coeffi- cient	Average growth	Average growth (weighted)
Government ideology	0.00906* (0.00467)	0.00855 (0.00528)	-0.00216 (0.00124)	0.000557 (0.000471)	0.00393 (0.00291)	0.00797 (0.00856)	0.00598 (0.00855)
Seat share government	0.00501 (0.0223)	0.00926 (0.0223)	-0.0128 (0.00922)	-0.00574* (0.00290)	-0.0119 (0.00929)	0.0138 (0.0286)	0.0129 (0.0260)
l.Increase in employee salaries	0.664 (0.434)	0.602 (0.494)	-0.109 (0.0698)	-0.0529 (0.0307)	0.341* (0.169)	-0.587 (0.425)	-0.442 (0.380)
l.Increase in Gini of employee salaries	0.0166 (0.0729)	0.00830 (0.0746)	0.0415* (0.0202)	0.0238** (0.00829)	-0.0489 (0.0516)	-0.0293 (0.0913)	-0.0109 (0.0811)
l.Increase in debt/GDP	0.0913* (0.0514)	0.0820 (0.0523)	-0.00153 (0.00843)	0.00540 (0.00526)	0.0113 (0.0233)	-0.108* (0.0570)	-0.0986* (0.0537)
l.Increase in civil servants p.c.	-0.139 (0.120)	-0.0319 (0.112)	0.00315 (0.0386)	-0.0465* (0.0243)	-0.0938 (0.115)	0.169 (0.291)	0.157 (0.256)
l.Dependent variable federal	0.0384 (0.242)	0.0261 (0.271)	0.168* (0.0791)	0.0434 (0.0323)	0.0996 (0.0784)	0.258 (0.217)	0.400* (0.192)
Time-fixed effects	-	-	-	-	-	-	-
Observations	50	50	50	50	50	50	50
Groups	16	16	16	16	16	16	16
R <sup>2</sup> within	0.395	0.332	0.366	0.392	0.298	0.230	0.321
R <sup>2</sup> between	0.0734	0.0372	0.420	0.00858	0.00546	0.143	0.304
R <sup>2</sup> overall	0.298	0.227	0.375	0.189	0.135	0.211	0.317

Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ .

## Do left-wing governments decrease income inequality?

**Table 4.5: OLS regression results with categorical government ideology variable (II)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Increase in diago- nal inequal- ity	Increase in verti- cal inequal- ity	Increase in hori- zontal in- equality	Increase in horizontal inequality (weighted)	Increase in Gini coeffi- cient	Average growth	Average growth (weighted)
Government ideology	0.00470 (0.00567)	0.00318 (0.00627)	-0.0028** (0.00129)	0.00116 (0.000680)	0.00528 (0.00437)	0.00798 (0.00510)	0.00497 (0.00527)
Seat share government	0.0145 (0.0180)	0.0213 (0.0207)	-0.00779 (0.00565)	-0.00382** (0.00133)	-0.0178 (0.0106)	-0.00401 (0.0277)	-0.00186 (0.0232)
l.Increase in em- ployee salaries	0.397 (0.447)	0.762 (0.539)	0.171 (0.116)	0.0742* (0.0417)	0.0543 (0.376)	-0.689 (0.721)	-0.501 (0.741)
l.Increase in Gini of employee salaries	0.0654 (0.0679)	0.0577 (0.0690)	0.0415*** (0.0122)	0.0335*** (0.00921)	-0.0418 (0.0424)	-0.0612 (0.0872)	-0.0434 (0.0840)
l.Increase in debt/GDP	-0.0108 (0.0745)	-0.0313 (0.0745)	-0.00401 (0.0136)	-0.00718 (0.00899)	0.0133 (0.0476)	0.0461 (0.0616)	0.0572 (0.0667)
l.Increase in civil servants p.c.	-0.283 (0.267)	0.0378 (0.230)	0.143* (0.0744)	-0.0176 (0.0394)	-0.416* (0.210)	-0.0812 (0.393)	0.0559 (0.410)
l.Dependent varia- ble federal	-0.0625 (0.312)	-0.297 (0.361)	0.202* (0.111)	0.00893 (0.0365)	0.0462 (0.0515)	0.448 (0.356)	0.474 (0.374)
2008	0.0122 (0.0173)	0.00545 (0.0171)	-0.000814 (0.00283)	-0.00149 (0.000925)	0.00710 (0.00822)	0.0164 (0.0126)	0.0121 (0.0165)
2009	0.0154 (0.0124)	0.0125 (0.0130)	0.00265 (0.00254)	-0.00231** (0.00105)	-0.00395 (0.00616)	-0.00076 (0.0165)	-0.00241 (0.0183)
2010	0.0422** (0.0182)	0.0322 (0.0190)	-0.00500 (0.00371)	-0.000451 (0.000830)	0.0164* (0.00893)	-0.0163 (0.0174)	-0.0235 (0.0217)
2011	0.0334 (0.0218)	0.0229 (0.0216)	-0.00682 (0.00459)	-0.00167* (0.000911)	0.0112 (0.0122)	-0.00018 (0.0218)	-0.00806 (0.0259)
2012	0.0393*** (0.0120)	0.0428** (0.0151)	-0.00342 (0.00325)	-0.00126 (0.000981)	0.0202** (0.00863)	-0.0183 (0.0206)	-0.0152 (0.0185)
2013	0.0169 (0.0137)	0.00688 (0.0123)	-0.00680* (0.00335)	-0.00499** (0.00220)	0.0118 (0.00928)	0.0137 (0.0216)	0.0107 (0.0233)
2014	0.0178 (0.0150)	0.00600 (0.0157)	-0.00628* (0.00319)	-0.00476** (0.00165)	0.00606 (0.0103)	0.0195 (0.0217)	0.0167 (0.0244)
2015	0.0306* (0.0156)	0.0273* (0.0155)	-0.0059** (0.00216)	-0.0027*** (0.000896)	0.00555 (0.00916)	0.00443 (0.0150)	0.00361 (0.0166)
2016	0.0230* (0.0122)	0.0166 (0.0115)	-0.00238 (0.00201)	-0.00224 (0.00137)	0.00853 (0.00972)	0.00435 (0.0199)	0.00473 (0.0201)
2017	0.0109 (0.0123)	0.00382 (0.0135)	-0.00576* (0.00296)	-0.0046*** (0.00148)	0.00519 (0.00931)	0.0173 (0.0166)	0.0141 (0.0192)
Observations	50	50	50	50	50	50	50
Groups	16	16	16	16	16	16	16
R <sup>2</sup> within	0.779	0.732	0.693	0.700	0.607	0.657	0.677
R <sup>2</sup> between	0.0283	0.0831	0.239	0.0978	0.0973	0.158	0.0623
R <sup>2</sup> overall	0.487	0.250	0.466	0.381	0.167	0.198	0.301

Reference category of year dummies: 2007. Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## Do left-wing governments decrease income inequality?

**Table 4.6: OLS regression results with ideology dummies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Increase in diagonal inequality	Increase in vertical inequality	Increase in horizontal inequality	Increase in horizontal inequality (weighted)	Increase in Gini coefficient	Average growth	Average growth (weighted)
Ideology left	0.00476 (0.00563)	0.00320 (0.00633)	-0.00280* (0.00137)	0.00116 (0.000692)	0.00526 (0.00448)	0.00798 (0.00517)	0.00500 (0.00534)
Ideology center	-0.000144 (0.00702)	0.000553 (0.00818)	-0.000319 (0.00122)	0.000592 (0.000727)	0.00193 (0.00328)	0.00375 (0.00407)	0.00139 (0.00419)
Seat share government	0.0225 (0.0287)	0.0247 (0.0352)	-0.0112 (0.00642)	-0.00386 (0.00253)	-0.0154 (0.0158)	-0.00318 (0.0361)	0.00192 (0.0312)
I.Increase in employee salaries	0.464 (0.418)	0.791 (0.555)	0.142 (0.100)	0.0739* (0.0407)	0.0757 (0.395)	-0.683 (0.753)	-0.475 (0.766)
I.Increase in Gini of employee salaries	0.0668 (0.0667)	0.0583 (0.0681)	0.0410*** (0.0120)	0.0335*** (0.00935)	-0.0415 (0.0437)	-0.0611 (0.0892)	-0.0430 (0.0866)
I.Increase in debt/GDP	-0.00955 (0.0713)	-0.0308 (0.0742)	-0.00472 (0.0125)	-0.00718 (0.00916)	0.0136 (0.0479)	0.0460 (0.0627)	0.0570 (0.0680)
I.Increase in civil servants p.c.	-0.310 (0.249)	0.0268 (0.250)	0.155* (0.0768)	-0.0174 (0.0383)	-0.424* (0.213)	-0.0838 (0.405)	0.0435 (0.414)
I.Dependent variable federal	-0.0623 (0.302)	-0.297 (0.360)	0.205* (0.107)	0.00867 (0.0388)	0.0431 (0.0553)	0.447 (0.363)	0.469 (0.374)
2008	0.0123 (0.0168)	0.00549 (0.0171)	-0.000860 (0.00269)	-0.00149 (0.000943)	0.00726 (0.00856)	0.0165 (0.0127)	0.0124 (0.0164)
2009	0.0156 (0.0124)	0.0126 (0.0133)	0.00260 (0.00270)	-0.00231* (0.00115)	-0.00375 (0.00673)	-0.00070 (0.0165)	-0.00213 (0.0181)
2010	0.0438** (0.0187)	0.0329 (0.0209)	-0.00568 (0.00368)	-0.000462 (0.000854)	0.0170 (0.00986)	-0.0161 (0.0182)	-0.0225 (0.0212)
2011	0.0337 (0.0216)	0.0231 (0.0218)	-0.00691 (0.00447)	-0.00167* (0.000887)	0.0114 (0.0125)	-0.00008 (0.0225)	-0.00755 (0.0258)
2012	0.0379*** (0.0126)	0.0422** (0.0175)	-0.00278 (0.00294)	-0.00126 (0.00103)	0.0200** (0.00855)	-0.0183 (0.0211)	-0.0156 (0.0193)
2013	0.0155 (0.0119)	0.00629 (0.0110)	-0.00622* (0.00320)	-0.00499** (0.00223)	0.0114 (0.00912)	0.0136 (0.0221)	0.0103 (0.0241)
2014	0.0177 (0.0141)	0.00596 (0.0153)	-0.00626* (0.00303)	-0.00476** (0.00169)	0.00606 (0.0103)	0.0196 (0.0219)	0.0170 (0.0241)
2015	0.0310* (0.0161)	0.0275 (0.0161)	-0.00604** (0.00228)	-0.00274** (0.000952)	0.00568 (0.00948)	0.00452 (0.0151)	0.00401 (0.0163)
2016	0.0210* (0.0107)	0.0158 (0.0115)	-0.00155 (0.00189)	-0.00223 (0.00137)	0.00803 (0.00977)	0.00422 (0.0209)	0.00408 (0.0214)
2017	0.0102 (0.0110)	0.00352 (0.0127)	-0.00547* (0.00285)	-0.0046*** (0.00149)	0.00502 (0.00911)	0.0173 (0.0169)	0.0141 (0.0195)
Observations	50	50	50	50	50	50	50
Groups	16	16	16	16	16	16	16
R <sup>2</sup> within	0.782	0.732	0.707	0.700	0.608	0.657	0.678
R <sup>2</sup> between	0.0352	0.0862	0.218	0.0973	0.0946	0.162	0.0782
R <sup>2</sup> overall	0.486	0.252	0.441	0.381	0.170	0.197	0.297

Reference category of year dummies: 2007. Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. All specifications include state-fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## Do left-wing governments decrease income inequality?

**Table 4.7: Percentage premia for cabinet members in the German states**

State	Percentage premium		Reforms 2007–2017
	Prime minister <sup>1</sup>	Minister <sup>2</sup>	
Baden-Wuerttemberg	20.00 (B11)	0.00 (B11)	-
Bavaria	28.00 (B11)	18.75 (B11)	-
Berlin	20.00 (B11)	0.00 (B11)	-
Brandenburg	9.00 (B11)	0.00 (B11)	-
Bremen	0.00 (B11)	0.00 (B11)	-
Hamburg	23.00 (B11)	23.00 (B11)	-
Hesse	19.00 (B11)	-0.77 (B11)	2010 (decrease)
Lower Saxony	27.40 (B10)	12.86 (B10)	-
Mecklenburg-Western Pomerania	10.00 (B11)	10.00 (B10)	-
North Rhine-Westphalia	33.33 (B11)	20.00 (B11)	-
Rhineland-Palatinate	13.49 (B10)	3.77 (B10)	2008 (decrease)
Saarland	10.00 (B11)	0.00 (B11)	-
Saxony	20.00 (B11)	0.00 (B11)	-
Saxony-Anhalt	10.00 (B11)	0.00 (B11)	-
Schleswig-Holstein	4.80 (B11)	4.80 (B10)	2013 (decrease)
Thuringia	22.00 (B10)	3.00 (B10)	2008 (decrease), 2011 (increase)

<sup>1</sup>: In Berlin, Bremen, and Hamburg “(First/Governing) Mayor”. <sup>2</sup>: In Berlin, Bremen, and Hamburg “Senator”. Note: Percentage premia are paid *on top* of B10 or B11 salary. Source: own illustration.

## 5 The real-estate transfer tax and government ideology: Evidence from the German states

### Abstract\*

In 2006, the reform of the German fiscal constitution realigned legislative powers between the federal and the state governments. The reform allowed German state governments to set the real-estate transfer tax rates – an important reform because German state governments have had basically no authority to set tax policies before. We investigate whether government ideology predicts the levels and increases in the real-estate transfer tax rates. The results show that left-wing and center governments were more active in increasing the real-estate transfer tax rates than right-wing governments. Many voters were disenchanted with the policies and platforms of the established German parties in the course of the euro and refugee crisis. Disenchantment notwithstanding, real-estate transfer tax policies show that the established political parties are still prepared to offer polarized policies.

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### 5.1 Introduction

Partisan theories hold that government ideology influences economic policy-making: left-wing governments are expected to implement more expansionary economic policies than right-wing governments (Hibbs 1977, Chappell and Keech 1986, Alesina 1987), and as a result, the size and scope of government is larger under left-wing than right-wing governments. A large size and scope of government includes, for example, pronounced public expenditure, taxes, debt and regulation of labor and product markets. Partisan politicians gratify the needs of their constituencies. Left-wing politicians are inclined to gratify the needs of low-income citizens (the working class), while right-wing politicians are inclined to gratify the needs of high-income citizens (traditionally the self-employed). Partisan politicians are therefore also expected not just to increase or decrease the size and scope of government; they will also design individual policy measures such as taxes to reward their constituencies. For example, left-wing governments are likely to tax capital to a larger extent than labor.

Many empirical studies have examined whether government ideology predicts individual economic policies (for new studies see, for example, Jäger 2017 and Schmitt and Zohlnhöfer 2018). Scholars use panel data for OECD countries and for states within federal countries, univariate time series for individual countries, as well as data for municipalities in particular, to derive causal effects (by employing, for example, Regression Discontinuity Designs – RDD – for close vote margins between left-wing and right-wing politicians). The evidence is mixed as to whether parties influence economic policy-making. For comprehensive surveys on partisan politics, see Potrafke (2017 and 2018) and Zohlnhöfer et al. (2018).

Investigating whether parties matter in economic policy-making is important because in many industrialized countries, the platforms and (individual) policies of established parties have converged since the 1990s. It is conceivable that many voters are disenchanted with the policies of the established parties, desire more polarized policies, and in turn, have started to support new parties entering the political arena. Examples include the populist left-wing SYRIZA in Greece (in the 2000s the social democratic PASOK and the conservative New Democracy won a combined total of around 80 percent of the votes, while in 2015 PASOK and New Democracy won a combined total of just 30 percent of the votes) and the populist right-wing Freedom Party in Austria (the Freedom Party was founded many decades ago, but has won significant electoral support since the 1990s).

Another example is Germany. When he took office in 2002 (his second term) the then chancellor Gerhard Schröder moved his Social Democratic Party (SPD) towards the middle of the political spectrum. His coalition government with the Greens implemented some fairly market-oriented policies such as liberalizing the labor market. As a result, the populist left-wing party DIE LINKE entered the political arena. Since the mid-2000s, the voting share of the left-wing SPD has decreased in federal elections (see, for example, Debus 2008). The right-wing Christian Conservative Union (CDU) moved towards the middle of the political spectrum when it

formed a grand coalition with the SPD in 2005. Economic policy positions in particular became far less market-oriented than at the beginning of the 2000s. Bailout policies in the course of the euro crisis diluted the economic policy platform of the CDU. A new populist right-wing party, the Alternative for Germany, was successful in many German state elections in 2015 and 2016. In the course of the refugee crisis in 2015, the CDU pursued a liberal immigration policy – alienating many core conservative voters. A precondition for the electoral success of the SPD and the CDU would seem to be more polarized policies.

There have been studies showing that the SPD and the CDU, being part of left-wing and right-wing governments, pursued different policies in the German states. For instance, right-wing governments spent more on universities and cultural affairs, were more active in introducing tuition fees, hired more policemen, and promoted greater economic freedom than left-wing governments (Oberndorfer and Steiner 2007, Potrafke 2011, Kauder and Potrafke 2013, Tepe and Vanhuyse 2013, Potrafke 2013). By contrast, public debt policies hardly differed between left-wing and right-wing state governments (Jochimsen and Nuscheler 2011, Jochimsen and Thomasius 2014, Potrafke et al. 2016).<sup>1</sup> Experts have not yet examined ideology-induced tax policies in the German states. The reason is that German state governments have had basically no authority to set tax policies.<sup>2</sup> Empirical tests of ideology-induced policies in the German states require, of course, examining policies that are influenced by the state governments (and not determined by the federal government).

In the course of the reform of the German fiscal constitution in 2006, the allocation of rights and duties between the federal and the state governments was realigned.<sup>3</sup> German state governments were allowed to set the real-estate transfer tax rates. The real-estate transfer tax thus became after a long time the first tax for which the state governments have the authority to set the tax rates.<sup>4</sup> Some state governments began to increase the real-estate transfer tax rate immediately in 2007. Other states have not increased the tax rate ever since. Allowing the German state governments to determine the real-estate transfer tax rates provides an excellent laboratory for investigating the prediction of partisan theories.

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<sup>1</sup> On ideology-induced policies at the local level see, for example, Roesel (2017).

<sup>2</sup> See Herwartz and Theilen (2014) for the extent to which state government ideology predicted efforts to collect tax revenues (for taxes set at the federal level). Koester (2009) investigates determinants of the tax policy on the federal level. While normative approaches are mostly unable to explain tax reforms, political economic reasons influence tax policy on the federal level. However, the author does not find evidence for ideology-induced tax policies at the federal level.

<sup>3</sup> Hildebrandt (2016) portrays the implications of the federalism reforms on the state fiscal policies.

<sup>4</sup> Scholars investigate the economic consequences of the real-estate transfer tax in Germany. Buettner (2017) examines welfare effects of the real-estate transfer tax. Buettner and Krause (2018a, b) examine the extent to which the fiscal equalization scheme affects states' tax policy (see also Chapters 6 and 7). Fritzsche and Vandrei (2016) investigate how the real-estate transfer tax influences the number of real-estate transactions in Germany. Petkova and Weichenrieder (2017) investigate the effect of the real-estate transfer tax on prices of single-family houses and apartments.

## The real-estate transfer tax and government ideology

The real-estate transfer tax is likely to influence citizens who own property – usually high-income citizens – and therefore seems suitable for redistributing income from the rich to the poor. Right-wing politicians are generally more hesitant to increase tax rates and view the purchase of real estate as worthy of support.<sup>5</sup> Left-wing politicians, by contrast, are more in favor of income redistribution. The hypotheses to be tested empirically are: left-wing governments are more active in increasing real-estate transfer tax rates than right-wing governments, and as a result, real-estate transfer tax rates are higher under left-wing than right-wing governments. We examine these hypotheses by case study evidence and descriptive statistics. We use state-year data for the 16 German states over the period 2007–2017. As we could not overcome the potential endogeneity of the government ideology variable when regressing real-estate transfer tax rates on government ideology (we cannot rule out reverse causality or that there is a third unobserved variable influencing both real-estate transfer tax rates and government ideology), we cannot estimate causal effects but elaborate on correlations. Moreover, the sample is too small to exploit close vote margins and use, for example, an RDD.

## 5.2 Institutional background

### 5.2.1 State governments in Germany's federalism

In Germany, the federal structure defines different rights and duties for the federal level, the states and the municipalities. In general, the state governments are responsible for dealing with the tasks of the states (including legislation) and executing the laws. The states are mostly also responsible for the financing of these tasks because the administrative and financial responsibility are linked according to the constitution. In any event, in some specific cases, the federal government helps the state governments to finance interests of the states. To fulfill the financial responsibilities, the state governments have different revenue sources. The main part of the states' tax revenues are shared taxes. Those taxes cover over three quarters of overall states' tax revenues. Revenues of the shared taxes include the revenues of the value added tax (VAT), the income tax, and the corporate tax and are shared among the federal, state and local governments. The states also obtain revenues from state taxes, whose amounts are exclusively for the states. The real-estate transfer tax is part of the state taxes. Moreover, a fiscal equalization scheme with horizontal and vertical stages redistributes revenues among the different levels and between the states. For a long time, the states had basically no means to determine the rates of any tax. In 2006, a reform of the German fiscal constitution realigned legislative powers between the federal and the state governments. The reform aimed to improve the efficiency within the federal system and to deconcentrate financial responsibilities between the federal level and the states. The reform also strengthened the tax autonomy of the state level by allowing the states to set the tax rate of the real-estate

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<sup>5</sup> Studies on ideology-induced tax policies include Quinn and Shapiro (1991), Beramendi and Cusack (2006), Beramendi and Rueda (2007), Angelopoulos et al. (2012), Osterloh and Debus (2012).

transfer tax. In general, federal law determines the tax bases and tax rates of the most important taxes – the real-estate transfer tax being the first exception.

### 5.2.2 The German real-estate transfer tax

The German real-estate transfer tax has to be paid on the price of the real estate determined in the contract between the selling and the purchasing party. The German real-estate transfer tax law describes that both seller and buyer are held responsible for the liability of the tax. The amount of tax will be transferred to the authorities by the contracting party that has been declared the taxpayer in the contract, which is usually the buyer of the real estate. Purchases of less than 2,500 euro or real-estate transfers due to inheritance or donation are exempt from the tax.

Since 2007, 14 out of the 16 states have increased real-estate transfer tax rates to levels of up to 6.5 percent (Brandenburg, North Rhine-Westphalia, Saarland, Schleswig-Holstein, Thuringia). Bavaria and Saxony are the only two states where the tax rate has remained at its pre-reform level of 3.5 percent. The real-estate transfer tax revenue collected by the federal states has risen from 4.8 in 2005 to 13.14 billion euro in 2017, amounting to an increase of 174 percent according to the Federal Ministry of Finance. In 2017, the real-estate transfer tax was the most important state tax. The share of the real-estate transfer tax with regard to the overall state taxes, whose amounts are exclusively for the states, was 59.2 percent. However, the real-estate transfer tax amounts to only 4.4 percent of the total amount of taxes received by federal states, which includes the shared taxes and also transfers from the German federal government to the states.

Comparing real-estate transfer taxes internationally remains difficult, because the laws of tax exemption and the taxable bases differ across countries. For example, in contrast to Germany, some countries set real-estate transfer tax rates on constituent real estate, while newly-built real estate applies to the value-added taxation. Moreover, in Germany, the tax base is taxed by a fixed rate differing across states. In Australia and Cyprus, for example, the real-estate transfer tax rate increases progressively with the value of the real estate and is determined at the national level. In any event, real-estate transfers tax rates are fairly high in Germany compared to other countries (Bechtoldt et al. 2014).

## 5.3 Case study evidence

Table 5.1 shows the real-estate transfer tax rates and the ideology of the government implementing tax increases in the individual states. In Baden-Wuerttemberg, there was a right-wing government for many decades (a grand coalition over the period 1992–1996 being an exception). In spring 2011, however, a left-wing Green-SPD government came into power which increased the real-estate transfer tax rate from 3.5 percent to 5 percent as of 5 November 2011. In Bavaria, there has been a right-wing government since the 1950s. Bavaria is one of the two

## The real-estate transfer tax and government ideology

German states in which the government has not increased the real-estate transfer tax rate. The left-wing government in the city state of Berlin increased the real-estate transfer tax rate from 3.5 percent to 4.5 percent as of 1 January 2007. The grand coalition (SPD and CDU) increased the real-estate transfer tax rate to 5 percent as of 1 April 2012 and to 6 percent as of 1 January 2014. In Brandenburg, the left-wing government increased the real-estate transfer tax rate to 5 percent as of 1 January 2011 and to 6.5 percent as of 1 July 2015. In the city state of Bremen, the left-wing SPD has been in power since the 1950s in manifold governments (in single party governments when having the absolute majority of the seats in parliament, in center governments with the conservative CDU, or in left-wing coalitions with the Green party, and in a coalition with the Green party and the market-oriented FDP). The grand coalition (SPD and CDU) did not change the real-estate transfer tax rate in the years 2007, 2008 and 2009 in Bremen. By contrast, the left-wing SPD-Green government increased the real-estate transfer tax rate from 3.5 to 4.5 percent as of 1 January 2011 and to 5 percent as of 1 January 2014 while in office. In Hamburg, the center CDU-Green government increased the real-estate transfer tax rate to 4.5 percent as of 1 January 2009. The SPD-led government, however, has not further increased the real-estate transfer tax rate since 2012. In Hesse, the right-wing government did not change the real-estate transfer tax rate for six years, and then increased the real-estate transfer tax rate to 5 percent as of 1 January 2013. The center government (CDU and Greens) increased the real-estate transfer tax rate further to 6 percent as of 1 August 2014. In Mecklenburg-Western Pomerania, the grand coalition increased the real-estate transfer tax rate to 5 percent as of 1 July 2012. In Lower Saxony, the right-wing government increased the real-estate transfer tax rate to 4.5 percent as of 1 January 2011; the left-wing government increased the real-estate transfer tax rate to 5 percent as of 1 January 2014.

North Rhine-Westphalia is another prime example for partisan politics. The right-wing government (which did not change the real-estate transfer tax rate) was voted out of office in 2010. The new left-wing government increased the real-estate transfer tax rate to 5 percent as of 1 October 2011 and to 6.5 percent as of 1 January 2015. In Rhineland-Palatinate, the left-wing government did not increase the real-estate transfer tax rate for a long time, and finally increased it to 5 percent as of 1 March 2012. In the Saarland, the right-wing government also did not increase the real-estate transfer tax rate for a long time. The new mixed coalition (CDU, FDP and Greens) increased the tax rate to 4.5 percent as of 1 January 2012 and to 5.5 percent as of 1 January 2013; the grand coalition (CDU and SPD) increased the real-estate transfer tax rate to 6.5 percent as of 1 January 2015. The Saarland and Bremen have the largest debt-to-GDP ratios of the German states. It is conceivable that the state governments in the Saarland and Bremen believed they could increase tax revenues and reduce the debt-to-GDP ratio (to better fulfill the requirement of the debt brake) by increasing the real-estate transfer tax rates. The real-estate transfer tax rate was not changed and remained at 3.5 percent in Saxony. The conservative CDU has reigned in Saxony for a long time: until 2012 in a right-wing government (with the FDP) and since 2012 in a grand coalition (with the SPD). In Saxony-Anhalt, the grand coalition (CDU and SPD) increased the real-estate transfer tax rate to 4.5 percent as of 2 March

2010 and to 5 percent as of 1 March 2012. In Schleswig-Holstein, the right-wing government did not increase the real-estate transfer tax rate for a long time and finally increased the tax rate to 5 percent as of 1 January 2012. The newly elected left-wing government (SPD, Greens and the Danish minority party) increased the real-estate transfer tax rate to 6.5 percent as of 1 January 2014. In Thuringia, the grand coalition increased the tax rate to 5 percent as of 7 April 2011. The left-wing government (LINKE, SPD, and Greens) increased the real-estate transfer tax rate to 6.5 percent as of 1 January 2017.

## 5.4 Empirical analysis

### 5.4.1 Unconditional correlations

The real-estate transfer tax rate was increased 26 times over the period 2007–2017: three times by a right-wing government, eleven times by a center and twelve times by a left-wing government.<sup>6</sup> No state government decreased the tax rate over the period 2007–2017. We use data on increases in the real-estate transfer tax rate from state law and ordinance gazettes, in which the states typically codify adjustments in the tax rate of the real-estate transfer tax.

The average increase in the real-estate transfer tax rate was 0.09 percentage points under right-wing governments, 0.18 percentage points under center governments and 0.22 percentage points under left-wing governments (Figure 5.1). A t-test on means shows that increases under right-wing governments were significantly different from increases under center and left-wing governments (statistically significant at the 10 percent level). The results thus indicate that right-wing governments increased the real-estate transfer tax rates to a lower extent than center and left-wing governments. The average real-estate transfer tax rates were thus lower under right-wing governments than under center and left-wing governments (statistically significant at the 1 percent level). In fact, the average real-estate transfer tax rate was 3.6 percent under right-wing governments, 4.5 percent under center governments and 4.9 percent under left-wing governments (Figure 5.2). The averaged tax rates and t-tests are computed for a sample of 176 observations (annual data for 16 states over the period 2007–2017). The descriptive statistics in Figure 5.2 thus consider years in which governments did not increase the real-estate transfer tax rates – which was probably intended to keep the size of government small.

Ideology-induced effects may well differ across the East German and West German states (*e.g.*, Potrafke 2013, Tepe and Vanhuysse 2014). In the West German states, the average increase in the real-estate transfer tax rate was 0.11 percentage points under right-wing governments, 0.26 percentage points under center governments and 0.18 percentage points under left-wing

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<sup>6</sup> A left-wing government is SPD (single party government), SPD/Greens, Greens/SPD, SPD/LINKE, LINKE/SPD/Greens. A center government is CDU/SPD, SPD/CDU, CDU/Greens, CDU/Greens/FDP. A right-wing government is CDU or CSU (single party government) and CDU/FDP or CSU/FDP. We follow related studies such as Potrafke et al. (2016) in coding the types of government.

## The real-estate transfer tax and government ideology

governments (Figure 5.3). A t-test on means shows that increases under right-wing governments were not significantly different from increases under their center and left-wing counterparts. The average real-estate transfer tax rate for the sample of the West German states was 3.6 percent under right-wing governments, 5.1 percent under center governments and 4.8 percent under left-wing governments (Figure 5.4). The sample includes 121 observations from 11 states. A t-test on means shows that the real-estate transfer tax rates were significantly lower under right-wing than under center and left-wing governments (statistically significant at the 1 percent level).

In the East German states, the average increase in the real-estate transfer tax rate was 0 percentage points under right-wing governments, 0.13 percentage points under center governments and 0.41 percentage points under left-wing governments (Figure 5.5). Right-wing governments in the East German states thus did not increase the real-estate transfer tax rate. A t-test on means shows that increases under left-wing governments were significantly higher than increases under their center and right-wing counterparts (statistically significant at the 5 percent level). The average real-estate transfer tax rate in the East German states was 3.5 percent under right-wing governments, 4.2 percent under center governments and 5.3 percent under left-wing governments (Figure 5.6). The sample includes 55 observations from five states. Real-estate transfer tax rates in the East German states were significantly lower under right-wing than under center and left-wing governments (statistically significant at the 1 percent level).

By comparing the average tax rates in the East German and West German states – conditioned on government ideology – the results seem to indicate that the average real-estate transfer tax rates for each type of government did not differ much between West and East German states. In fact, the average tax rates under left-wing governments were statistically significant higher in East German states than in West German states (significant at the 5 percent level). Under center governments, the average tax rates were statistically significant higher in West German states than in East German states (significant at the 1 percent level). Under right-wing governments, the tax rates did not turn out to differ statistically significant between West and East German states. Inferences showing that left-wing and center governments were more active in increasing the real-estate transfer tax rates than right-wing governments do not change when we include Berlin in the sample of the East German states and exclude it therefore in the sample of the West German states.

We also examine the nexus between government ideology and real-estate transfer tax rates for the thirteen non-city states in Germany (the city states are Berlin, Bremen and Hamburg). In the non-city states, the average real-estate transfer tax rate was 3.6 percent under right-wing governments, 4.5 percent under center governments and 5.1 percent under left-wing governments. A t-test on means shows that real-estate transfer tax rates were significantly

different under right-wing than under center and left-wing governments (statistically significant at the 1 percent level).

#### 5.4.2 Conditional correlations

We investigate the correlation between government ideology and real-estate transfer tax rates conditional to other variables. The baseline panel-data model has the following form:

$$\begin{aligned} \text{Tax rate}_{i,t} = & \beta \text{Government ideology}_{i,t-1} \\ & + \gamma \text{Voter preferences}_{i,t} + \delta \text{Debt per capita}_{i,t-1} + \varepsilon \text{Shared taxes per capita}_{i,t-1} \\ & + \eta_i + \tau_t + u_{i,t} \\ & \text{with } i = 1, \dots, 16; t = 1, \dots, 11 \end{aligned}$$

where  $\text{Tax rate}_{i,t}$  measures the tax rate of the real-estate transfer tax in state  $i$  and year  $t$ .  $\text{Government ideology}_{i,t-1}$  measures ideology-induced policy-making and assumes the value 1 when a left-wing government was in office, the value 0.5 for a center government, and the value 0 for a right-wing government (e.g., Kauder and Potrafke 2013). We use the government variable measured in period  $t-1$  because decisions on the tax rates are usually taken in the year before the adjustment takes place.<sup>7</sup> We use the variable  $\text{Voter preferences}_{i,t}$ , which measures the share of right-wing voters (CDU/CSU and FDP) in federal elections. We do so to disentangle the effect of government ideology and voter preferences on tax policy (see, e.g., Elinder and Jordahl 2013, Liang 2013, or Freier and Odendahl 2015). We use the vote shares of the last federal election for each state. It is conceivable that governments use the possibility to increase tax rates for budget consolidation – especially with regard to fulfilling the German debt brake in 2020.<sup>8</sup> An indicator to evaluate the budgetary situation of the states with regard to the debt brake is the level of debt per capita. We therefore include a variable  $\text{Debt per capita}_{i,t-1}$ , which measures the amount of debt per capita of the respective state from the previous year. The lion's share of the states' tax revenues are shared taxes (i.e., income taxes, corporate taxes and the value added taxes). The state governments have basically no authority to design the tax policies of the shared taxes and may thus have an incentive to increase the real-estate transfer tax rate when the share of the shared taxes decreases. We therefore include the amount of the shared taxes per capita as another explanatory variable ( $\text{Shared taxes per capita}_{i,t-1}$ ). The variables  $\text{Debt per capita}_{i,t-1}$  and  $\text{Shared taxes per capita}_{i,t-1}$  are measured in period  $t-1$ . We also include fixed time and fixed state effects. We estimate the fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors – see Huber 1967 and White 1980).

<sup>7</sup> In some cases, the decision on and the adjustment of the tax rate took place in the same year. We always consider the government which decided on the tax adjustment.

<sup>8</sup> A new law on German debt brakes implemented in 2009 states that the state governments are not allowed to run structural deficits after 2020. The states can choose different consolidation strategies to fulfill the debt brake after 2020. One possibility is to increase the revenues of the state by increasing the tax rates of the real-estate transfer tax (Potrafke et al. 2016).



## The real-estate transfer tax and government ideology

Table 5.2 shows descriptive statistics of the individual variables. Table 5.3 shows the correlation coefficients between our variables. Government ideology and the real-estate transfer tax rates are positively correlated (the coefficient of correlation is 0.499), which is statistically significant at the 1 percent level. The real-estate transfer tax rates are also positively correlated with *Debt per capita* and *Shared taxes per capita*, but negatively with the variable measuring the share of right-wing voters in federal elections.

Table 5.4 shows the regression results excluding fixed time effects. In discussing the results, we focus on our preferred specification including all control variables in Column (4). The coefficient of *Government ideology* is positive and statistically significant at the 1 percent level. The tax rate of the real-estate transfer tax is 0.75 percentage points higher under left-wing than under right-wing and center governments. Focusing on the control variables, the coefficients for *Debt per capita* and *Shared taxes per capita* are significant. The coefficients are, however, very small. Based on the regression results, Figure 5.7 shows the average tax rates under right-wing, center and left-wing governments conditional to voter preferences (the vote shares for the CDU/CSU and the FDP in federal elections), the debt per capita ratio, the shared taxes per capita ratio in the states and fixed state effects.

In Table 5.5 we include fixed time effects. The coefficient of the government ideology variable is positive and statistically significant at the 5 percent level indicating that the real-estate transfer tax rate is 0.52 percentage points higher under left-wing than under right-wing and center governments. The coefficients of *Debt per capita* and *Shared taxes per capita* do not turn out to be statistically significant. Based on the regression results, Figure 5.8 shows the average tax rates under right-wing, center and left-wing governments conditional to voter preferences, the debt per capita ratio, the shared taxes per capita ratio and fixed time and state effects.

### 5.4.3 Robustness tests

We submitted our results to rigorous robustness tests. We investigate the correlation between government ideology and the first difference in the real-estate transfer tax rates conditional to other variables. The conditional correlation between government ideology in period  $t-1$  and the first difference in the real-estate transfer tax rates is positive and statistically significant at the 10 percent level, when we condition on the vote shares for the CDU/CSU and the FDP in federal elections (*Voter preferences*), the debt per capita ratio, the shared taxes per capita ratio and state-fixed effects. Inferences do not change when we include fixed time effects.

We also condition the correlation between government ideology and the real-estate transfer tax rate on demographic variables by taking into account the share of young citizens up to 20 years and the share of old citizens above 60 years. The real-estate transfer tax might affect age classes in different ways depending on whether they already own property. Thus, state governments may well consider the age distribution within a state when deciding on tax rates.

Firstly, by excluding fixed time effects but including fixed state effects, the correlation between *Government ideology* and the real-estate transfer tax rate is positive and statistically significant at the 1 percent level. When fixed time effects are also included, the correlation between *Government ideology* and the real-estate transfer tax rate remains positive and statistically significant at the 5 percent level. Focusing on the demographic variables, the coefficient for the share of old citizens is positive and statistically significant only when excluding fixed time effects. The coefficient for the share of young citizens is negative and statistically significant at the 5 percent level when including fixed time effects. We also include the share of left-wing voters (SPD, Greens, and Left Party) instead of the share of right-wing voters in federal elections. Inferences do not change regarding *Government ideology*. The results show that government ideology is significantly correlated with the real-estate transfer tax rates also when conditioning on other variables.

We also examine the increases in the real-estate transfer tax rates by the type of government on the basis of legislative periods. There were 35 different full legislative periods between 2007 and 2017. The average increase in the real-estate transfer tax rate is 0.31 percentage points lower under right-wing than under left-wing governments. The difference in the increases of the tax rates under left-wing and right-wing governments is statistically significant at the 1 percent level. We also examine the increases in the real-estate transfer tax rates on the basis of cabinet periods (Schmitt 2015) to take into account the duration of the respective governments in each state. There were 62 different cabinets in the time period between 2007 and 2017. The average increase under left-wing governments was significantly higher than under right-wing and center governments (statistically significant at the 10 percent level). In fact, the average increase based on cabinet periods was 0.08 percentage points under right-wing, 0.14 percentage points under center and 0.24 percentage points under left-wing governments.

Governments might postpone tax rate increases until after elections because of electoral motives.<sup>9</sup> We examine electoral cycles in the timing of the decision on tax rate increases. The real-estate transfer tax rate was increased 26 times over the period 2007–2017. Out of the 26 decisions, 5 decisions on tax rate increases took place in an election year; another 3 decisions took place in the pre-election year, while 11 decisions were taken after an election year.<sup>10</sup> To examine the effect of electoral motives on real-estate transfer tax rate increases in more detail, we include dummy variables for the individual types of years in the regressions (pre-election year, election year, post-election year). The coefficient of the pre-election year dummy variable is

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<sup>9</sup> The political business cycle theories describe that election-motivated politicians pursue expansionary policies before elections. For example, politicians may increase public spending or decrease taxes (Nordhaus 1975, Rogoff and Sibert 1988, Rogoff 1990; see De Haan and Klomp 2013 for a survey on studies dealing with political business cycles).

<sup>10</sup> Decisions on increases in the real-estate transfer tax rate in an election year always took place after the election. In case of early elections, we consider the decision on the tax rate increase only as belonging to the pre-election year when early elections were known at that point of time.

negative but lacks statistical significance – including/excluding fixed time effects notwithstanding – when we use the increases in the real-estate transfer tax rates as the dependent variable. This holds also true for the election year dummy variable. The coefficient of the post-election year variable is positive and statistically significant at the 10 percent level indicating that governments postpone tax rate increases until after elections. Inferences with regard to the election dummy variables do not change when we include all election dummy variables at the same time. By including the election variables, the government ideology variable remains positive but does not turn out to be statistically significant at conventional levels.

We also examined whether our results are driven by individual years or individual states. When we exclude individual years or states, one at a time (jackknife test), the results still show a positive and significant correlation between the government ideology variable and the real-estate transfer tax rates.

### 5.5 Conclusion

In 2006, the German fiscal constitution was reformed. The reform allowed the German state governments to set the real-estate transfer tax rates (the tax rate was 3.5 percent at the end of 2006). The reform lends itself to an examination because German state governments have had hardly any tools for determining tax rates. Allowing the German state governments to set the rates of the real-estate transfer tax is an excellent case in point to investigate whether government ideology predicts economic policy-making. The real-estate transfer tax is likely to influence high-income citizens (often voters of right-wing parties) to a larger extent than low-income citizens (often voters of left-wing parties). We focus on case study evidence and a descriptive correlational analysis in the 16 German states because we cannot derive causal effects in the small sample. The results show that right-wing governments were less active in increasing the real-estate transfer tax rates than left-wing and center governments. Over the period 2007–2017, the real-estate transfer tax rate was increased 26 times: three times under right-wing governments, eleven times under center governments and twelve times under left-wing governments. The average tax rate was 3.6 percent under right-wing governments, 4.5 percent under center governments and 4.9 percent under left-wing governments. Bavaria and Saxony, two German states with quite conservative electorates (and governments), did not increase the real-estate transfer tax rate over the period 2007–2017. In Baden-Wuerttemberg and North Rhine-Westphalia the newly elected left-wing governments increased the real-estate transfer tax rates when following right-wing governments. We also examine the correlation between government ideology and real-estate transfer tax rates conditional to other variables. The results show that government ideology is correlated with the real-estate transfer tax rates when taking into account other variables such as fixed state and time effects, public debt per capita, shared taxes per capita, voter preferences and demographic variables.

## The real-estate transfer tax and government ideology

Government ideology retired to the background at the federal level. There has hardly been any difference in the policies pursued by CDU- and SPD-led federal governments since the 1990s (e.g., Zohlnhöfer 2003, Potrafke 2012, Kauder and Potrafke 2016). Many voters were disenchanted by the catch-all policies of the CDU and SPD; in the early 2000s, the populist left-wing party (DIE LINKE) entered the political arena and gained some electoral support. In 2015 and 2016, the populist right-wing Alternative for Germany was successful in many state elections. With polarized tax policies of CDU/CSU and SPD-led state governments, voters may well find the established parties attractive, rather than supporting parties at the fringe of the political spectrum.

We have conjectured that voters of left-wing parties are more inclined to increase the real-estate transfer tax rates than voters of right-wing parties. Future research may well compile survey evidence describing the nexus between political ideologies and voters' preferences regarding the real-estate transfer tax.

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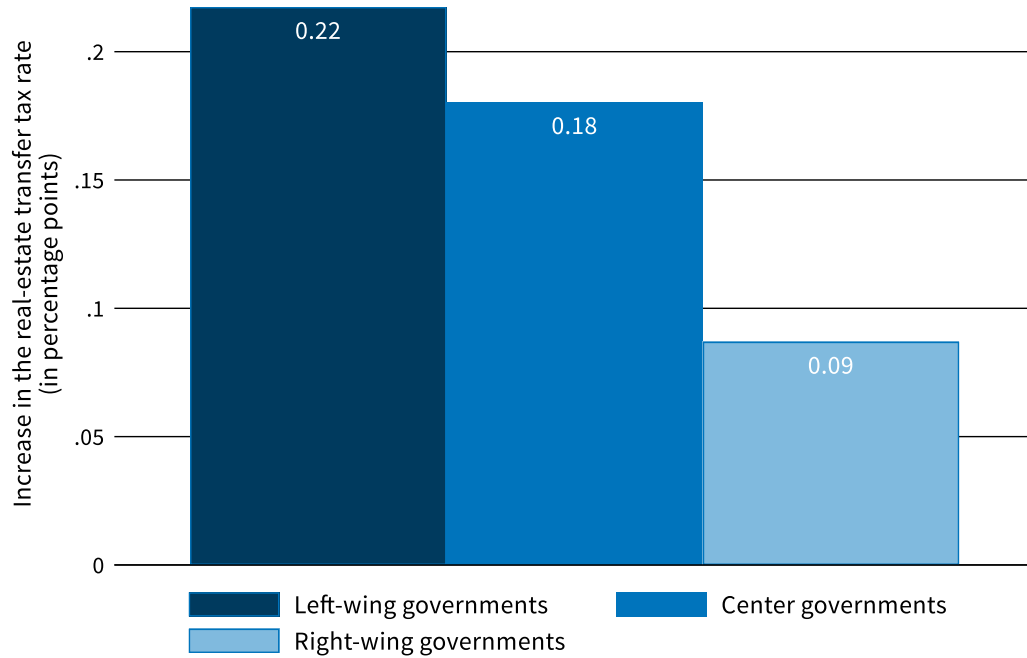
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## Appendix

Figure 5.1: Increases in the real-estate transfer tax rate by type of government, 2007–2017



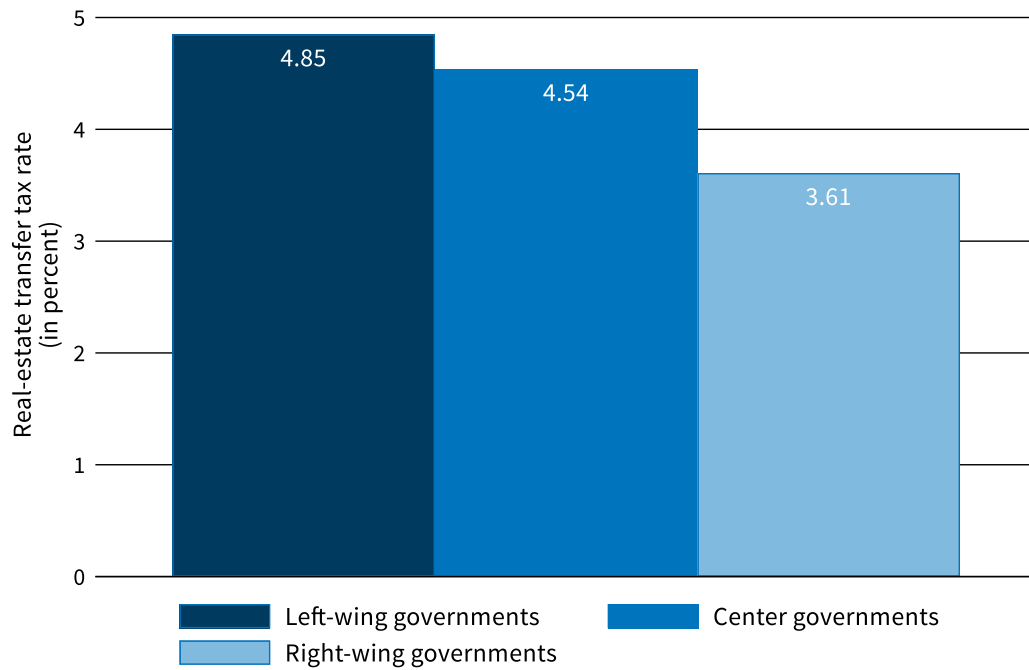
Note: The averaged increases in the tax rates and t-tests are computed for a sample of 176 observations (annual data for 16 states over the period 2007–2017).

Source: state law gazettes; own calculations.



## The real-estate transfer tax and government ideology

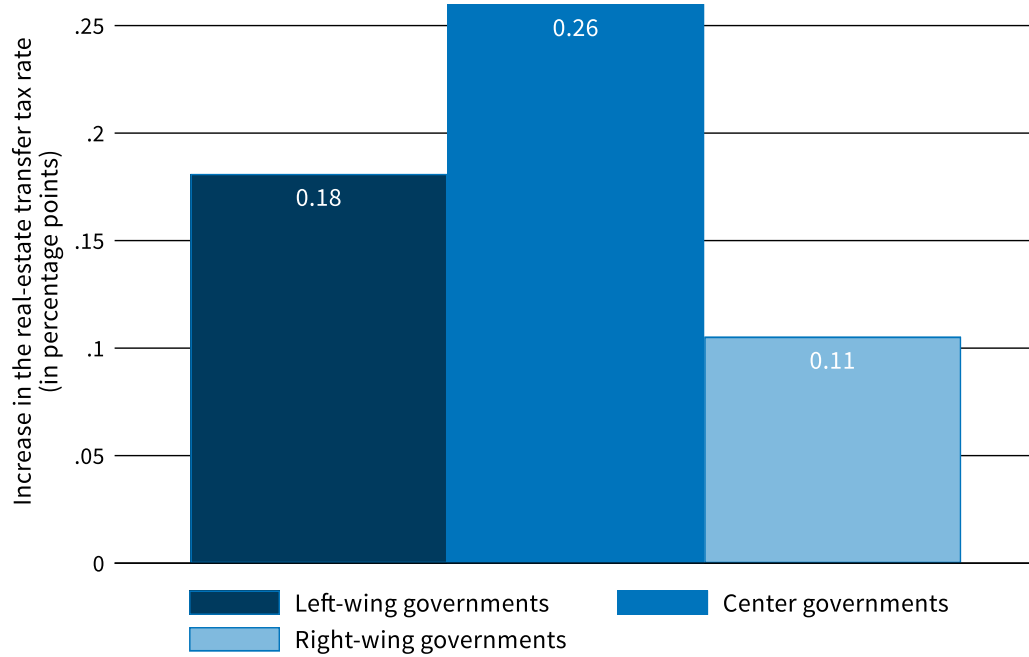
Figure 5.2: Real-estate transfer tax rate by type of government, 2007–2017



Note: The averaged tax rates and t-tests are computed for a sample of 176 observations (annual data for 16 states over the period 2007–2017).

Source: state law gazettes; own calculations.

Figure 5.3: Increases in the real-estate transfer tax rate by type of government, West German states, 2007–2017

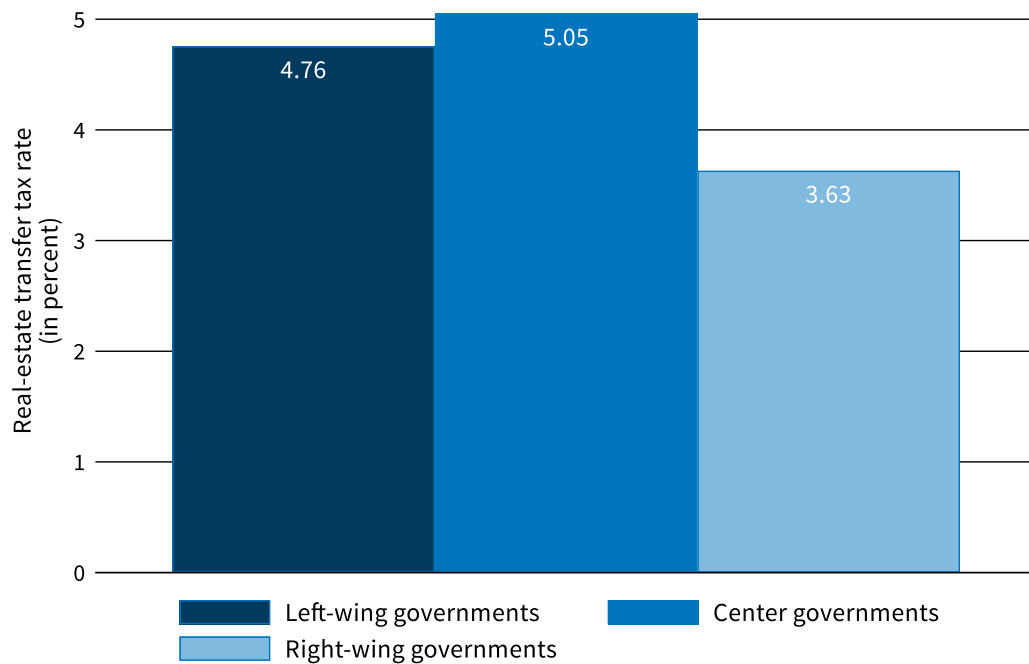


Note: The averaged increases in the tax rates and t-tests are computed for a sample of 121 observations (annual data for 11 states over the period 2007–2017). The sample includes Baden-Wuerttemberg, Bavaria, Berlin, Bremen, Hamburg, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland and Schleswig-Holstein.

Source: state law gazettes; own calculations.

## The real-estate transfer tax and government ideology

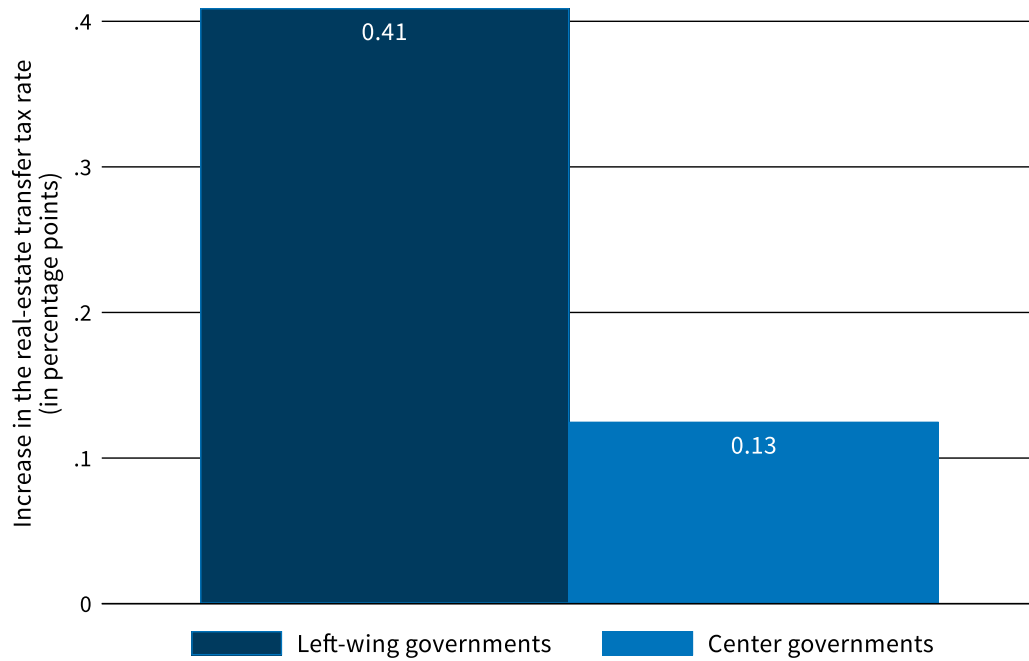
Figure 5.4: Real-estate transfer tax rate by type of government, West German states, 2007–2017



Note: The averaged tax rates and t-tests are computed for a sample of 121 observations (annual data for 11 states over the period 2007–2017). The sample includes Baden-Wuerttemberg, Bavaria, Berlin, Bremen, Hamburg, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland and Schleswig-Holstein.

Source: state law gazettes; own calculations.

Figure 5.5: Increases in the real-estate transfer tax rate by type of government, East German states, 2007–2017

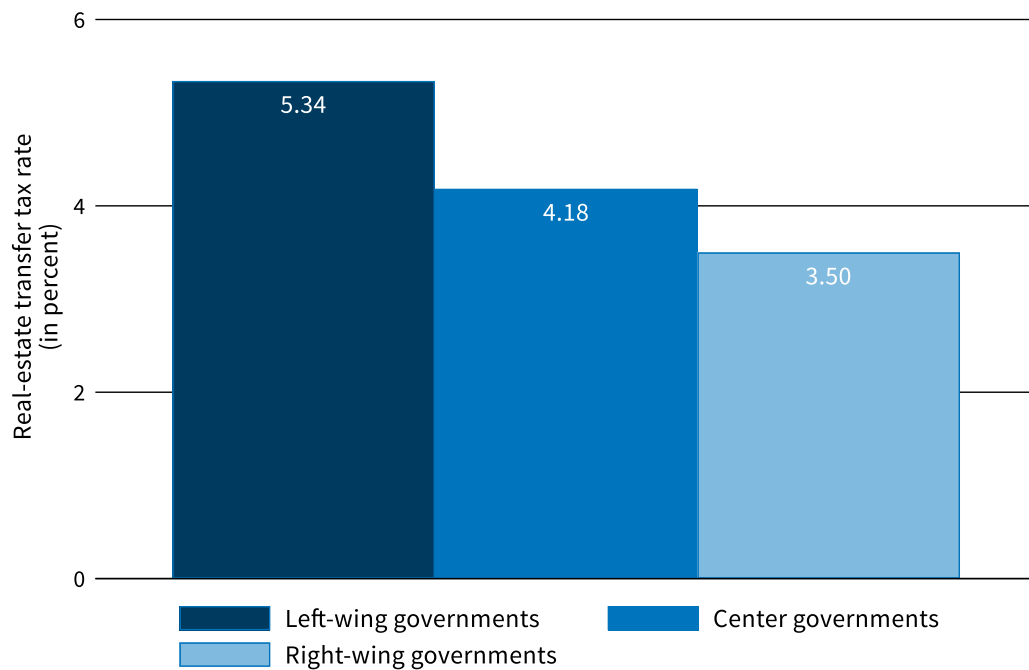


Note: The averaged increases in the tax rates and t-tests are computed for a sample of 55 observations (annual data for 5 states over the period 2007–2017). The sample includes Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia. Right-wing governments did not increase the real-estate transfer tax rates.

Source: state law gazettes; own calculations.

## The real-estate transfer tax and government ideology

Figure 5.6: Real-estate transfer tax rate by type of government, East German states, 2007–2017



Note: The averaged tax rates and t-tests are computed for a sample of 55 observations (annual data for 5 states over the period 2007–2017). The sample includes Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Source: state law gazettes; own calculations.

Table 5.1: Real-estate transfer tax rate by states and type of government, 2007–2017

State	Tax rate since 1998 (in percent)	Tax rate increase on	To a tax rate of (in percent)	Type of government implementing the tax rate increase
Baden-Wuerttemberg	3.5	05-11-2011	5.0	left-wing
Bavaria	3.5	No increase		(right-wing)
Berlin	3.5	01-01-2007	4.5	left-wing
		01-04-2012	5.0	center
		01-01-2014	6.0	center
Brandenburg	3.5	01-01-2011	5.0	left-wing
		01-07-2015	6.5	left-wing
Bremen	3.5	01-01-2011	4.5	left-wing
		01-01-2014	5.0	left-wing
Hamburg	3.5	01-01-2009	4.5	center
Hesse	3.5	01-01-2013	5.0	right-wing
		01-08-2014	6.0	center
Mecklenburg-Western Pomerania	3.5	01-07-2012	5.0	center
Lower Saxony	3.5	01-01-2011	4.5	right-wing
		01-01-2014	5.0	left-wing
North Rhine-Westphalia	3.5	01-10-2011	5.0	left-wing
		01-01-2015	6.5	left-wing
Rhineland-Palatinate	3.5	01-03-2012	5.0	left-wing
Saarland	3.5	01-01-2012	4.5	center
		01-01-2013	5.5	center
		01-01-2015	6.5	center
Saxony	3.5	No increase		(right-wing and center)
Saxony-Anhalt	3.5	02-03-2010	4.5	center
		01-03-2012	5.0	center
Schleswig-Holstein	3.5	01-01-2012	5.0	right-wing
		01-01-2014	6.5	left-wing
Thuringia	3.5	07-04-2011	5.0	center
		01-01-2017	6.5	left-wing

Note: Dates are listed in DD-MM-YYYY.

Source: BFW – Bundesverband Freier Immobilien- und Wohnungsunternehmen.

## The real-estate transfer tax and government ideology

**Table 5.2: Descriptive statistics**

	Obs.	Mean	Std. Dev.	Min	Max
Real-estate transfer tax rate	176	4.418	0.958	3.5	6.5
Government ideology ( $t-1$ )	176	0.565	0.400	0	1
Share of right-wing voters (CDU/CSU and FDP) in federal elections	176	43.14	6.929	27.5	58.7
Debt per capita ( $t-1$ )	176	9,766.9	6,656.5	1,749.7	35,181.1
Shared taxes per capita ( $t-1$ )	176	2,239.2	291.4	1,770.8	3,229.7
Share of left-wing voters (SPD, Greens and Left) in federal elections	176	48.92	7.840	32.2	67.5
Share of young citizens (younger than 21)	176	31.94	3.793	25.22	38.6
Share of old citizens (older than 60)	176	49.58	5.435	40.1	64.4
Pre-election	176	0.188	0.391	0	1
Election	176	0.199	0.400	0	1
Post-election	176	0.222	0.417	0	1

Note: We define variables in Section 5.4.2.

Table 5.3: Correlation between the main variables

	Real-estate transfer tax rate	Government ideology ( $t-1$ )	Share of right-wing voters in federal elections	Debt per capita ( $t-1$ )	Shared taxes per capita ( $t-1$ )	Share of left-wing voters in federal elections	Share of young citizens	Share of old citizens
Real-estate transfer tax rate	1							
Government ideology ( $t-1$ )	0.499***	1						
Share of right-wing voters in federal elections	-0.185**	-0.352***	1					
Debt per capita ( $t-1$ )	0.291***	0.504***	-0.599***	1				
Shared taxes per capita ( $t-1$ )	0.473***	0.123	0.151*	-0.001	1			
Share of left-wing voters in federal elections	-0.073	0.218***	-0.901***	0.553***	-0.359***	1		
Share of young citizens	-0.049	-0.116	0.623***	-0.144*	0.064	-0.512***	1	
Share of old citizens	0.248***	-0.024	0.040	-0.202**	-0.050	-0.176**	-0.223***	1

Note: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . We define variables in Section 5.4.2.



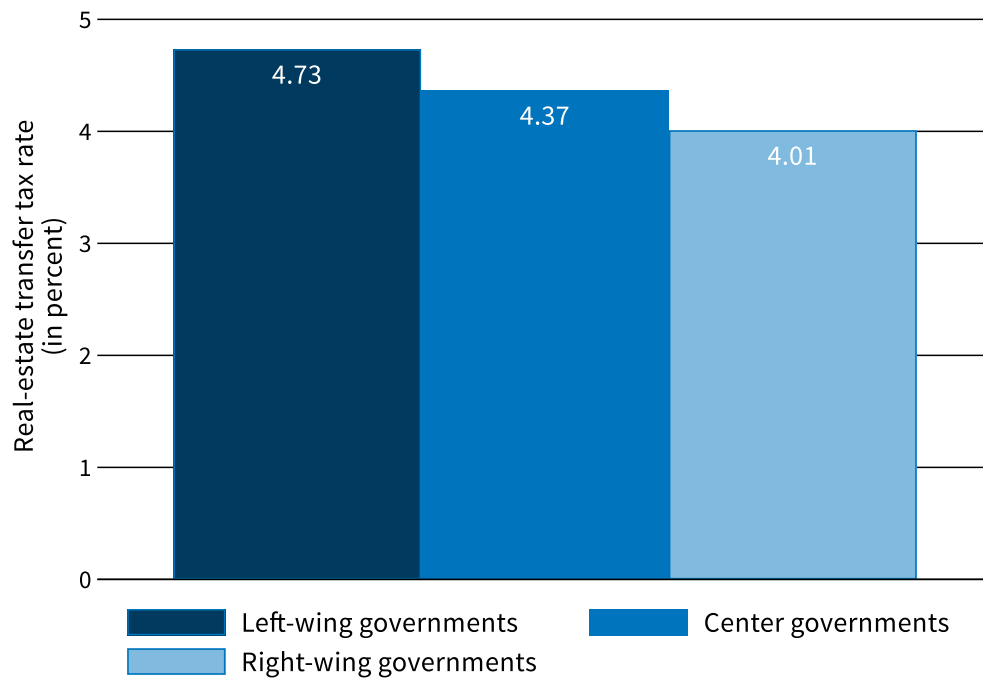
## The real-estate transfer tax and government ideology

**Table 5.4: OLS regression results (I)**

	(1)	(2)	(3)	(4)
Government ideology ( $t-1$ )	1.602*** (0.315)	1.596*** (0.307)	1.075*** (0.269)	0.752*** (0.194)
Share of right-wing voters (CDU/CSU and FDP) in federal elections		0.0538 (0.0401)	0.0438 (0.0380)	0.0168 (0.0293)
Debt per capita ( $t-1$ )			0.000184** (0.000067)	0.000100* (0.000050)
Shared taxes per capita ( $t-1$ )				0.00193*** (0.000495)
Time-fixed effects	-	-	-	-
State-fixed effects	Yes	Yes	Yes	Yes
Observations	176	176	176	176
Groups	16	16	16	16
R <sup>2</sup> within	0.318	0.339	0.436	0.650
R <sup>2</sup> between	0.194	0.000240	0.177	0.0823
R <sup>2</sup> overall	0.259	0.165	0.168	0.321

Dependent variable: Real-estate transfer tax rate (in percent). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Figure 5.7: Conditional correlations – real-estate transfer tax rate by type of government, 2007–2017 (I)



Note: The figure shows averaged tax rates conditional to the share of right-wing voters (CDU/CSU and FDP) in federal elections, the debt per capita ratios, the shared taxes per capita ratios (all evaluated at the mean) and fixed state effects.

Source: own calculations.

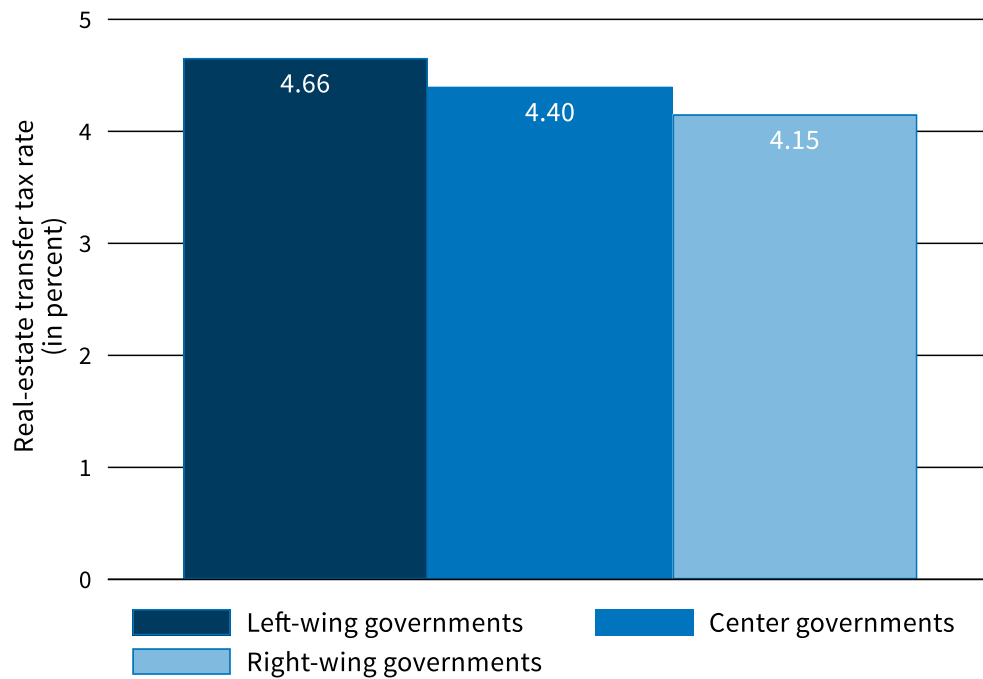
## The real-estate transfer tax and government ideology

**Table 5.5: OLS regression results (II)**

	(1)	(2)	(3)	(4)
Government ideology ( $t-1$ )	0.608** (0.222)	0.632** (0.220)	0.545** (0.192)	0.520** (0.187)
Share of right-wing voters (CDU/CSU and FDP) in federal elections		0.0295 (0.0407)	0.0283 (0.0409)	0.0333 (0.0421)
Debt per capita ( $t-1$ )			0.000041 (0.000048)	0.000039 (0.000046)
Shared taxes per capita ( $t-1$ )				-0.000472 (0.000607)
Time-fixed effects	Yes	Yes	Yes	Yes
State-fixed effects	Yes	Yes	Yes	Yes
Observations	176	176	176	176
Groups	16	16	16	16
R <sup>2</sup> within	0.727	0.730	0.731	0.733
R <sup>2</sup> between	0.194	0.0312	0.0806	0.0715
R <sup>2</sup> overall	0.621	0.525	0.585	0.580

Dependent variable: Real-estate transfer tax rate (in percent). Fixed-effects model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors) in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Figure 5.8: Conditional correlations – real-estate transfer tax rate by type of government, 2007–2017 (II)



Note: The figure shows averaged tax rates conditional to the share of right-wing voters (CDU/CSU and FDP) in federal elections, the debt per capita ratios, the shared taxes per capita ratios (all evaluated at the mean), fixed time effects and fixed state effects.

Source: own calculations.

## The real-estate transfer tax and government ideology

## 6 Federalism in Wonderland: Tax autonomy in German real-estate transfer taxation

### Abstract

Using the devolution of tax setting powers to German states since 2006, this chapter examines the consideration of real-estate transfer tax revenues within the German fiscal equalization system. We simulate the development of fiscal redistribution within the equalization scheme for each state from 2006 to 2016. The results show that there is a strong fiscal incentive for many states to increase their tax rates because they not only receive higher tax revenues, but also higher transfers. States that do not increase their tax rates experience a paradoxical situation whereby each additional euro of real-estate transfer tax revenue causes a decrease in state revenues from transfers that exceeds the increase in tax revenue.

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\* This chapter is based on joint work with Thiess Büttner. It is based on our paper “Föderalismus im Wunderland: Zur Steuerautonomie bei der Grunderwerbsteuer”, *Perspektiven der Wirtschaftspolitik*, 19(1), 32–41, 2018. We would like to thank Niklas Potrafke for helpful suggestions and comments and Lisa Giani Contini for proof-reading. Kristin Fischer, Tobias Görbert and Felix Michalik provided excellent research assistance.

### 6.1 Introduction

A recent federal reform of the German fiscal constitution in 2006 realigned legislative powers between the federal and the state governments. The reform allowed German states to set the tax rate of the real-estate transfer tax. The reform aimed to strengthen state governments' autonomy in taxation, because prior to the reform states could not adjust tax revenues to their needs. Only municipalities were able to set the tax rates of property and business taxes. The choice of the real-estate transfer tax was reasonable as it is a state tax whose revenue is exclusively for the states. The states actively used their right to set the tax rates. Since 2006, most states have raised their tax rates. The real-estate transfer tax rate was increased 25 times in total prior to 2017. No state has lowered its tax rate.

This development may be an indicator for the states being under substantial revenue stress and thus adjusting their tax policies accordingly. Krause and Potrafke (2017) also provide evidence for political economic determinants of the real-estate transfer tax policy in recent years (see also Chapter 5). Taking into account the federal fiscal equalization system, an additional explanation becomes evident: the tax autonomy of the states is limited to the extent that the fiscal equalization scheme still accounts for revenues from real-estate transfer taxes. This combination provides a conflict between tax autonomy and redistributive fiscal equalization. On the one hand, states have the opportunity to adjust their revenues. On the other hand, fiscal equalization reduces disparities in fiscal capacity among states. This tension has implications for the states' tax policy. The states need to consider how revenues from the real-estate transfer tax change with an increase in the tax rate. But the states also need to consider changes in transfers from fiscal equalization. States that make contributions within the equalization scheme have to account for changes in paid transfers, while states that receive transfers must investigate how received transfers change.

The combination of tax autonomy and fiscal equalization may provide incentives for an excessive taxation (e.g., Buettner and Schwager 2003). This also holds for the real-estate transfer tax in Germany. The legislator has tried to solve the conflict between tax autonomy and equalization by not using the revenue from the real-estate transfer tax directly within the equalization scheme, but by using standardized tax revenues instead. The calculation of states' revenues from taxes and other contributions (*Förderabgaben*) within the equalization scheme thus only considers revenues of the real-estate transfer tax that would arise if an average real-estate transfer tax rate is applied to the total taxable land and real-estate transactions. Increasing or decreasing the own tax rate thus does not give rise to an immediate rise or fall in the fiscal capacity of a state, which determines transfers within the fiscal equalization scheme. The use of a representative tax rate does not, however, solve the conflict. Accounting for real-estate transfer tax revenues within the fiscal equalization scheme still provides strong incentives to increase the real-estate transfer tax rate. For states that receive transfers, an increase in the tax rate is related to both an increase in tax revenue and in transfers from the

fiscal equalization system. For states that make contributions, the contributions within fiscal equalization decline. A state that does not increase its tax rate to the same extent as the other states might face a decline in revenues. A paradoxical situation may even arise whereby states' revenues decline with every additional euro from real-estate transfer tax revenues because the transfers decrease so strongly.

We exploit the development of the real-estate transfer tax rate since 2006 to examine the redistribution of revenues within the fiscal equalization system by focusing on the real-estate transfer tax revenues. Employing a comprehensive simulation model, we examine how the incentives to set the tax rates of the real-estate transfer tax have developed within the fiscal equalization system since 2006. The results show that the incentives to raise the tax rate have increased over time, especially for states, which have left the real-estate transfer tax rate unchanged. Since 2012 the state of Saxony, for example, has been in a situation where every additional euro of real-estate transfer tax revenue reduces overall financial resources. According to the newest calculations, Saxony loses about 1.38 euro with every additional euro from the real-estate transfer tax through a decline in transfers within fiscal equalization. It is conceivable that more states will get into such a paradoxical situation if the actual development in the real-estate transfer tax rates continues. Recent calculations for Bremen and Mecklenburg-Western Pomerania – based on the preliminary statistics for the year 2016 – seem to confirm this hypothesis.

The economic literature has examined incentives of fiscal redistribution on local tax policies from a theoretical point of view (see, e.g., Smart 1998, Köthenbürger 2002). Empirical studies investigate how grants provided to German municipalities influence tax policy of the municipalities (e.g., Buettner 2006). How incentives in the fiscal equalization system influence the setting of the real-estate transfer tax rate has hardly been discussed. The Advisory Board to the Federal Ministry of Finance highlighted this problem in a report from 2015 (Wissenschaftlicher Beirat 2015, p. 25). Other studies illustrate the incentives of fiscal equalization by simulating different scenarios and show that the real-estate transfer tax is distorting (Boysen-Hogrefe 2017; see also Fritzsche and Vandrei 2016, Petkova and Weichenrieder 2017, Buettner 2017b). We focus on determining and examining the degree of fiscal redistribution within fiscal equalization, which causes the incentive effect to raise the tax rates.

The following section describes the conflict between tax autonomy and fiscal equalization and the resulting incentive effect. Section 6.3 develops a measure that calculates the specific fiscal incentive faced by each state. Section 6.4 briefly outlines the simulation approach. Section 6.5 presents the results and quantifies the development of fiscal redistribution over time. Finally, we briefly discuss how the incentive for excessive taxation in the case of the real-estate transfer tax may be reduced.



## 6.2 Tax autonomy and fiscal equalization

Even though states are autonomous in setting the real-estate transfer tax rates, the fiscal equalization system considers real-estate transfer tax revenues when determining a state's fiscal capacity. Considering the tax revenues reflects that tax autonomy and fiscal redistribution are inversely related. Considering the tax revenues in the fiscal equalization system also influences tax policy. Higher tax revenues change transfers and contributions within the fiscal equalization system, which may also influence tax rate decisions. The fiscal equalization scheme does not use the actual real-estate transfer tax revenues. The fiscal equalization scheme considers instead standardized tax revenues determined by a representative tax rate. Applying a standardization does nevertheless not solve the conflict between tax autonomy and fiscal equalization for two reasons.

Firstly, changes in tax rates trigger changes in behavior. This also applies to the real-estate transfer tax. A higher tax rate may cause less successful land and real-estate deals or give rise to increased attempts to avoid taxes. The empirical literature also provides evidence of these effects in Germany. The number of transactions is shown to decline with higher tax rates (Fritzsche and Vandrei 2016). Additionally, transactions of single-family houses are shown to decrease with a higher tax rate (Petkova and Weichenrieder 2017). For apartments, by contrast, a tax-induced decrease in prices is shown. Another study provides evidence of a significant decrease in the tax base (Buettner 2017b). A further study shows a similar result based on a model with delayed adjustments (Boysen-Hogrefe 2017). It is likely that the volume of taxable purchases of land and real estate declines when the tax rate increases. A state's fiscal capacity thus might decrease, which gives rise to increased transfers or decreased contributions. This creates an incentive to increase the tax rate since fiscal equalization partially, or even substantially, compensates for the adverse influence of a high tax rate on the tax base.<sup>1</sup>

The second reason why applying a representative tax rate within the fiscal redistribution scheme does not solve the conflict between tax autonomy and fiscal equalization is that the standardized tax rate depends on each state's tax policy. The tax rates of large states directly influence the level of the representative tax rate. All other states' tax decisions also affect the representative tax rate. Since the federal reform in 2006 that allowed states to set the real-estate transfer tax rate, many states have adjusted their tax rates. Until 2016, 25 increases in the real-estate transfer tax rate have been implemented. In 2016, the mean tax rate exceeded the 2006 level by the factor 1.5. Revenues from the real-estate transfer tax have thus become more important within the fiscal equalization system – regardless of individual states' tax rate choices. This development also creates an incentive to raise tax rates. States that have a tax

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<sup>1</sup> For the incentive effect on tax policy, see Smart (1998) and Köthenbürger (2002). For empirical evidence, see for example Dahlby and Warren (2003) and Buettner (2006).

rate below the representative tax rate receive a higher fiscal capacity within fiscal equalization than is actually true. These states thus need to increase their own tax rates to avoid declines in revenues.

How important this incentive effect is results from how strongly fiscal equalization reacts to changes in real-estate transfer tax revenues. The literature measures this effect using the marginal retention rate (*cf.* Ragnitz 2014, Wissenschaftlicher Beirat 2015).<sup>2</sup> The marginal retention rate (*Verbleibsquote*) describes the share of an additional euro of tax revenue that a state keeps after fiscal redistribution. In terms of the first reason (behavior change), the marginal retention rate measures the share of the decline in revenues resulting from a shrinking tax base that is compensated by fiscal equalization. In terms of the second reason (representative tax rate), the marginal retention rate shows how the tax policies of all states influence incentives of individual states to raise their own tax rate. The marginal retention rate also shows whether there are paradoxical situations, as described above in certain states. How the fiscal equalization scheme reacts to additional revenue in a state also depends on the relative fiscal capacity of the state. The effects vary across states and over time as a result. The following analysis determines the marginal retention rate separately for each state and thereby illustrates these differences.

### 6.3 Definition of the marginal retention rate

Federate state  $i$  initially receives tax revenue  $A_i = t_i B_i$  from the real-estate transfer tax with tax rate  $t_i$  and the taxable base  $B_i$ . This revenue is not used within the fiscal equalization system. Instead, the equalization system uses the fiscal capacity  $SK_i$  and disregards the level of the individual tax rate. The fiscal capacity can be understood as a state specific function of tax base and tax rate:  $SK_i = SK_i(B_i, t_i)$ . Fiscal capacity is calculated by applying the state's share in the total tax base to the sum of tax revenue of all states:

$$SK_i = \frac{B_i}{\sum_{i=1}^N B_i} \sum_{i=1}^N A_i.$$

This implies that we can calculate fiscal capacity by using a representative tax rate on the tax base:

$$SK_i = B_i \bar{t},$$

where the representative tax rate is defined as the weighted average of all tax rates

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<sup>2</sup> For the calculation of the marginal tax burden, see Hirte (1996) and Huber and Lichtblau (1998).

$$\bar{t} = \frac{\sum_{i=1}^N B_i t_i}{\sum_{i=1}^N B_i}. \quad (1)$$

An increase in the taxable base gives rise to an increase in fiscal capacity. Formally:<sup>3</sup>

$$\frac{\partial SK_i}{\partial B_i} = \bar{t} + \left( \frac{B_i}{\sum_{i=1}^N B_i} \right) (t_i - \bar{t}). \quad (2)$$

The magnitude of the effect on fiscal capacity depends on the average tax burden. Depending on a state's share in the total tax base, there is an additional effect. For states with a tax rate above the representative tax rate, fiscal capacity increases slightly more, and slightly less for states with a tax rate below the representative tax rate.

The change in fiscal capacity influences fiscal equalization transfers. A rise in fiscal capacity implies a decrease in transfers or an increase in contributions to the equalization system. The effect on financial resources is in any case negative. A rise in the volume of taxable land and real-estate transactions, *i.e.*, a rise in the tax base, however, increases tax revenues. The net revenue effect can thus be positive or negative.

The revenues of state *i* are defined in simplified terms by the revenue from the real-estate transfer tax and fiscal equalization transfers, which can be positive (transfers) or negative (contributions):

$$E_i = t_i B_i + FA_i,$$

where  $FA_i$  are fiscal equalization transfers. Fiscal transfers are determined by a state specific function of fiscal capacity:  $FA_i = FA_i(SK_i)$  with  $\partial FA_i / \partial SK_i < 0$ .

The effect of an increase in the volume of taxable land and real-estate transactions on total revenues is:<sup>4</sup>

$$\frac{\partial E_i}{\partial B_i} = t_i + \frac{\partial FA_i}{\partial SK_i} \frac{\partial SK_i}{\partial B_i}.$$

The term  $\partial FA_i / \partial SK_i$  determines how transfers change when fiscal capacity changes. Due to the non-linearity of the fiscal equalization system, the effect  $\partial FA_i / \partial SK_i$  differs across states depending on the actual revenues in the state and in all other states. For receiving states, the effect can be substantial – up to a complete imputation. In this extreme case, transfers decrease as much as fiscal capacity increases:  $\partial FA_i / \partial SK_i = -1$ . Such a strong reaction is likely

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<sup>3</sup> For simplicity's sake, the formal treatment assumes continuous differentiability.

<sup>4</sup> Changes in the tax base in state *i* have additional effects on the fiscal capacity in other states, as the representative tax rate changes. The effects on the transfers in state *i* are, however, negligible in their magnitude.

to give rise to a paradoxical situation whereby, despite higher tax revenues, some states end up with less revenues. The marginal retention rate measures this effect:

$$VQ_i = \frac{1}{t_i} \frac{\partial E_i}{\partial B_i} = 1 + \frac{\partial FA_i}{\partial SK_i} \left[ \frac{\bar{t}}{t_i} \left( 1 - \frac{B_i}{\sum_{i=1}^N B_i} \right) + \left( \frac{B_i}{\sum_{i=1}^N B_i} \right) \right]. \quad (3)$$

The marginal retention rate describes the share of the additional tax revenue resulting from an increase in taxable land and real-estate transactions that remains in a state after fiscal redistribution. In the case of lump-sum transfers, there would be no effect of fiscal capacity on transfers, as the second term on the right side would drop out and the marginal retention rate would equal one. The more the transfers decrease with fiscal capacity,  $\partial FA_i / \partial SK_i < 0$ , the smaller the marginal retention rate. It also matters whether the own state's tax rate differs from the weighted average tax rate. If the tax rate is above the weighted average tax rate, the second term is lower and the marginal retention rate is higher. In a state with a comparatively low tax rate, the second term has more weight and the marginal retention rate is lower.

In the case of full imputation, the marginal retention rate is

$$VQ_i \Big|_{\frac{\partial FA_i}{\partial SK_i} = -1} = \left( 1 - \frac{B_i}{\sum_{i=1}^N B_i} \right) \left( 1 - \frac{\bar{t}}{t_i} \right).$$

This expression is smaller than zero if a state's tax rate is below the weighted average tax rate. This applies irrespectively of the state's share in the total tax base.

Defining the marginal retention rate, we have focused on the effect of a rise in the volume of taxable land and real-estate transactions. The discussion of the incentive effect on tax policy has to consider the high elasticity of the tax base with respect to the tax rate. A high elasticity of the tax base implies that the income effect of a tax rate increase is small. The marginal retention rate and the effect on the weighted average tax rate also influence the income effect of a higher individual tax rate. A small marginal retention rate implies a stronger income effect. This shows that the incentive effect of fiscal equalization – especially for smaller states – will only disappear if the fiscal equalization system disregards the tax and the marginal retention rate equals one.

## 6.4 Simulation of the marginal retention rate

The German fiscal equalization system consists of different stages of vertical and horizontal distribution of funds. States' revenues do not directly determine the resulting fiscal transfers. Instead, the vertical and horizontal distribution of revenues between the federal and the state

governments have to be considered. Each stage uses slightly different approaches to determine fiscal capacity and fiscal needs and also draws on the results of previous stages.<sup>5</sup> We thus need to simulate the equalization scheme to compute how a rise in the tax base influences the redistribution in the equalization scheme.

We take into account the rules of the fiscal equalization system and the annual announcements of the fiscal equalization account from 2006 until 2016 passed by the Federal Ministry of Finance. The simulation illustrates the redistribution system on a valid basis. This means that the marginal retention rate of a year accurately takes into account the circumstances that applied to the specific year. We separately calculate the effect of an increase in revenues from the real-estate transfer tax for each state in each year, holding revenues in all other states – given their tax policy – constant. The increase in revenues is calculated by an increase in the tax base of the individual state in an individual year. To make reasonable comparisons, we assume that the size of the shock in the tax base is the same for all states. The simulation assumes quantitatively that the shock in the tax base of the state is scaled so as to generate a tax revenue increase of 1 million euro if the tax rate of the state equals the weighted average of all tax rates. This scaling causes the shocks in the tax base to become slightly smaller over time, as the average tax burden increased over the years. Since the shocks are the same for all states in a year, this time trend is irrelevant for the results.

In a first step, the simulation calculates the own tax revenues of a state assuming a higher tax base in the examined state. This implies a change in the standardized tax revenue of the real-estate transfer tax in the examined state. The values for the other states remain unchanged. The sum of the standardized tax revenues of all states, however, rises accordingly. The simulation then determines the states' shares of value added tax (VAT) revenue. The model determines states' taxes within the fiscal equalization system regardless of potential cuts, since these are only temporary. The marginal retention rate, by contrast, measures only long-run redistribution effects. The model adopts municipalities' taxes within the fiscal equalization system according to the rules. In a next step, the model calculates equalization transfers and contributions. After testing for any excessive equalization contributions, the model finally calculates the supplementary vertical grants paid by the federal government. The simulation yields an estimate for state revenues after redistribution. This generates the marginal retention rate according to the illustration above, subject to the assumed change in the real-estate transfer tax revenues.

### 6.5 The development of the marginal retention rate

Since the federal reform in 2006, real-estate transfer tax rates have developed very differently across German states (Table 6.1). Three groups of states can be distinguished. The first group

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<sup>5</sup> For a description of the regulations, see Wissenschaftlicher Beirat (2015).

includes states that increased their real-estate transfer tax rate to a maximum of 5 percent. The second group consists of states that experienced a particularly strong increase in the tax rate since 2006. It includes Hesse, North Rhine-Westphalia, Berlin, Brandenburg, Saarland and Schleswig-Holstein. These states have raised their tax rates to at least 6 and up to 6.5 percent. The third group consists of states that have not yet adjusted their real-estate transfer tax rate and whose tax rate has therefore remained constant at 3.5 percent since 2006. This applies to Bavaria and Saxony.

Within these three groups, Table 6.1 also distinguishes between contributing ( $FA < 0$ ) and receiving ( $FA > 0$ ) states. The arrangement in contributing and receiving states follows Wissenschaftlicher Beirat (2015) and also includes the distribution of the VAT share.

Table 6.2 shows the calculated marginal retention rates of the states in 2006 and 2016 following a rise in the revenue from the real-estate transfer tax. Each figure shows the share of an increase in tax revenue of 1 million euro that remains in the state after redistribution. The value of 0.37 for Baden-Wuerttemberg, for example, means that from 1 million euro at least 370,000 euro remain in the state after redistribution. The table shows the expected picture of low marginal retention rates for receiving states and higher marginal retention rates for contributing states for 2006. The difference also arises due to the stronger redistribution for financially weak states. After the federal reform in 2006, many states adjusted the real-estate transfer tax rate and increased their tax rates. The marginal retention rates for 2016 look very different. Saxony, for instance, shows a particularly strong decline in the marginal retention rate from 2006 to 2016. With a marginal retention rate of -0.38, Saxony is in the paradoxical situation described above: with every additional euro the state collects in the real-estate transfer tax, it loses revenues of 1.38 euro through the decrease in fiscal equalization transfers. The state thus loses more financial resources within fiscal equalization than it collects in taxes with every taxable land and real-estate transaction. Other states like Brandenburg and Schleswig-Holstein currently have significantly higher marginal retention rates compared to 2006.

Figure 6.1 shows how the representative tax rate – *i.e.* the weighted average tax rate – has developed and how the mean marginal retention rate has developed from 2006 to 2016. The mean is defined as the yearly average of the marginal retention rates of all states. The mean marginal retention rate apparently remained constant over time. In the last two years there has been a slight decline. The states have massively increased their tax rates since 2007. The weighted average tax rate for the imputation of taxable land and real-estate transactions within the fiscal equalization system increased accordingly. In 2006, it matches the statutory tax rate of 3.5 percent. In 2016, the representative tax rate is above 5 percent.

Figure 6.2 shows how the marginal retention rates have developed since 2006 for the group of states that increased their tax rates to no more than 5 percent. The left panel shows the mar-

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ginal retention rates of the contributing states. The right panel shows how the marginal retention rates of receiving states have developed. To simplify the interpretation of the development, the figures include the yearly mean of marginal retention rates as a reference line. Figure 6.2 shows that the marginal retention rates of contributing states like Baden-Wuerttemberg or Hamburg are mostly well above the rates of the receiving states and above the mean marginal retention rate. The marginal retention rates of receiving states are, by contrast, mostly below the mean rate. The marginal retention rates of the states in this group indicate no distinct trend over time. With the development of Mecklenburg-Western Pomerania's marginal retention rate, however, the fiscal incentive to increase the real-estate transfer tax rate as created by the fiscal equalization scheme becomes apparent. Mecklenburg-Western Pomerania has had a negative marginal retention rate since 2010, which hit a low in 2012. Every taxable land and real-estate transaction thus caused a decline in revenues in Mecklenburg-Western Pomerania in the sense that the decline in fiscal equalization transfers exceeded the additional tax revenue. The incentive of the state to increase its real-estate transfer tax rate has thus grown even more since 2010. Mecklenburg-Western Pomerania did indeed increase its tax rate in 2012 from 3.5 to 5 percent, which gave rise to a positive marginal retention rate in 2013.

Figure 6.3 shows the marginal retention rates of those states that raised their tax rates the most. The left and right panel distinguishes again between contributing and receiving states. The left panel shows that the contributing states like Hesse have higher marginal retention rates compared to the receiving states. The marginal retention rates for the six states in the second group again do not indicate any clear trend over time, but are subject to stronger variation than the marginal retention rates of the states in the first group. The figure shows that states that sharply increased their real-estate transfer tax rates have higher marginal retention rates at the end of the observation period compared to states that only marginally raised their tax rate. In 2016 the marginal retention rates of the states in the second group are all above the mean marginal retention rate. The rates of the states in the first group are all below the mean rate (with one exception). How the marginal retention rates for the states in the second group have developed also explains their tax policy. In Hesse, for example, a decline in the marginal retention rate in 2012 is followed by an increase in the real-estate transfer tax rate from 3.5 to 5.0 percent as of 2013. This rise is linked to a direct increase in the marginal retention rate from 21 to 32 percent in 2013.

Figure 6.4 shows how the marginal retention rates have developed for the two states that have not changed their tax rates since 2006, but have left them at a level of 3.5 percent. The marginal retention rate for Bavaria, which has to pay contributions within fiscal equalization, is higher than for the receiving state Saxony. This also holds true for the recent time period. The figure, however, shows a negative trend over time for both Bavaria and Saxony. This explicitly applies since 2012. For Saxony, the marginal retention rate has even been negative since 2012.

Saxony has thus already been in the paradoxical situation described above, namely that increasing tax revenues from the real-estate transfer tax give rise to less total revenues, for years. The negative development in the marginal retention rates of Bavaria and Saxony are related to the increases in the tax rates of the other states. In 2011 and 2012 alone, the rate of the real-estate transfer tax has been changed twelve times in the other states. With every additional increase in the tax rates, however, there is a decline in the marginal retention rates of those states that leave their real-estate transfer tax rate unchanged. This development boosts the fiscal incentives of the states to raise their tax rates.

## 6.6 Conclusion

The developments in the marginal retention rates of the states show how tax autonomy and fiscal equalization conflict. There is a tradeoff between tax autonomy of the states for the real-estate transfer tax rates and the consideration of this tax within the federal fiscal equalization system. The legislator has tried to solve this conflict by applying a weighted average tax rate, instead of the own tax rates of the states for the imputation of real-estate transfer tax revenues within the fiscal equalization system. Using a simulation model, we calculate the marginal retention rates of additional tax revenue in the fiscal equalization scheme. The results show that the imputation of the real-estate transfer tax in the fiscal equalization system still creates strong fiscal incentives to raise the tax rate of the real-estate transfer tax. While the state keeps the additional revenue from an increase in the tax rate, the decline in taxable land and real-estate transactions, induced by the higher tax burden, is largely offset by higher transfers or lower contributions within the fiscal equalization system. This mostly happens at the expense of the other states.

The use of the real-estate transfer tax revenues within the fiscal equalization system gives rise to a paradoxical situation for states with low real-estate transfer tax rates. An increase in taxable land and real-estate transactions is associated with a decline in transfers from fiscal equalization, which exceeds the increase in tax revenue. This means that a decrease in taxable land and real-estate transactions goes hand in hand with additional financial resources through fiscal equalization, which compensate for the decline in tax revenue.

It is fair to assume that the fiscal incentives from the use of the real-estate transfer tax revenues within the fiscal equalization system can explain a substantial part of the increases in the real-estate transfer tax rates in recent years. The empirical analysis of this hypothesis is not the subject of this chapter. Chapter 7 shows, however, that differences in the marginal retention rates have – independent of the states' fiscal capacity – significant effects on the real-estate transfer tax rates (Buettner and Krause 2018).

The excessive imputation of the real-estate transfer tax within the fiscal equalization system is also problematic, independent of the incentive effect on the tax rate. It is remarkable that a state that uses its constitutional right to not raise the real-estate transfer tax rate, loses more



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revenues with every additional taxable land and real-estate transaction through fiscal redistribution than it generates as additional tax revenue. This situation is comparable to the odd experiences in the story of Alice in Wonderland: a state, that generates only small revenues, is classified as financially strong within the fiscal equalization system and vice versa. In this paradoxical situation, the tax administration is effectively becoming senseless for the state, and taxpayers do their states a bad turn. Other states are the only beneficiaries of financial resources. Meanwhile, the state that actually generates them has less resources.

The reorganization of the fiscal equalization system from 2020 onwards could have been a good opportunity to adjust the use of the real-estate transfer tax in fiscal equalization, avoiding an over-levelling in the future. The regulations adopted, however, do not contain corresponding adjustments (Buettner 2017a). Completely avoiding the incentive effects of fiscal equalization on the choice of the tax rate would mean excluding the real-estate transfer tax from the federal fiscal equalization system. This recommendation, however, contrasts from a political perspective with the distribution effects. Not considering the revenues of the real-estate transfer tax would only lead to an improvement in the financial situation of those states that enjoy high revenues from the real-estate transfer tax at a given tax rate. A pragmatic approach to avoiding negative marginal retention rates and to slowing down the process of increases in the tax rates is to calculate the fiscal capacity from the real-estate transfer tax with a fixed representative tax rate. This tax rate could, for example, be set to a level of 3.5 percent or below. One reason for a value of below 3.5 percent is that not only the marginal retention rates for the current tax rates are positive, but the incentive to increase the tax rate would be weakened and autonomy would be promoted.

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## Appendix

**Table 6.1: Real-estate transfer tax rates, 2006–2016**

State	Fiscal transfers	Tax rate increase on	To a tax rate of (in percent)
<b>Group 1: Increase in the tax rate up to 5 percent</b>			
Baden-Wuerttemberg	< 0	05-11-2011	5.0
Hamburg	< 0	01-01-2009	4.5
Rhineland-Palatinate	< 0	01-03-2012	5.0
Bremen	> 0	01-01-2011 01-01-2014	4.5 5.0
Mecklenburg-Western Pomerania	> 0	01-07-2012	5.0
Lower Saxony	> 0	01-01-2011 01-01-2014	4.5 5.0
Saxony-Anhalt	> 0	02-03-2010 01-03-2012	4.5 5.0
Thuringia	> 0	07-04-2011	5.0
<b>Group 2: Increase in the tax rate to 6 percent or more</b>			
Hesse	< 0	01-01-2013 01-08-2014	5.0 6.0
North Rhine-Westphalia	< 0	01-10-2011 01.01.2015	5.0 6.5
Berlin	> 0	01-01-2007 01-04-2012 01-01-2014	4.5 5.0 6.0
Brandenburg	> 0	01-01-2011 01-07-2015	5.0 6.5
Saarland	> 0	01-01-2012 01-01-2013 01-01-2015	4.5 5.5 6.5
Schleswig-Holstein	> 0	01-01-2012 01-01-2014	5.0 6.5
<b>Group 3: No increase in the tax rate</b>			
Bavaria	< 0	-	-
Saxony	> 0	-	-

Note: The Column “Fiscal transfers” shows whether a state receives transfers within the fiscal equalization ( $FA > 0$ ) or has to make contributions ( $FA < 0$ ). Dates are listed in DD-MM-YYYY.

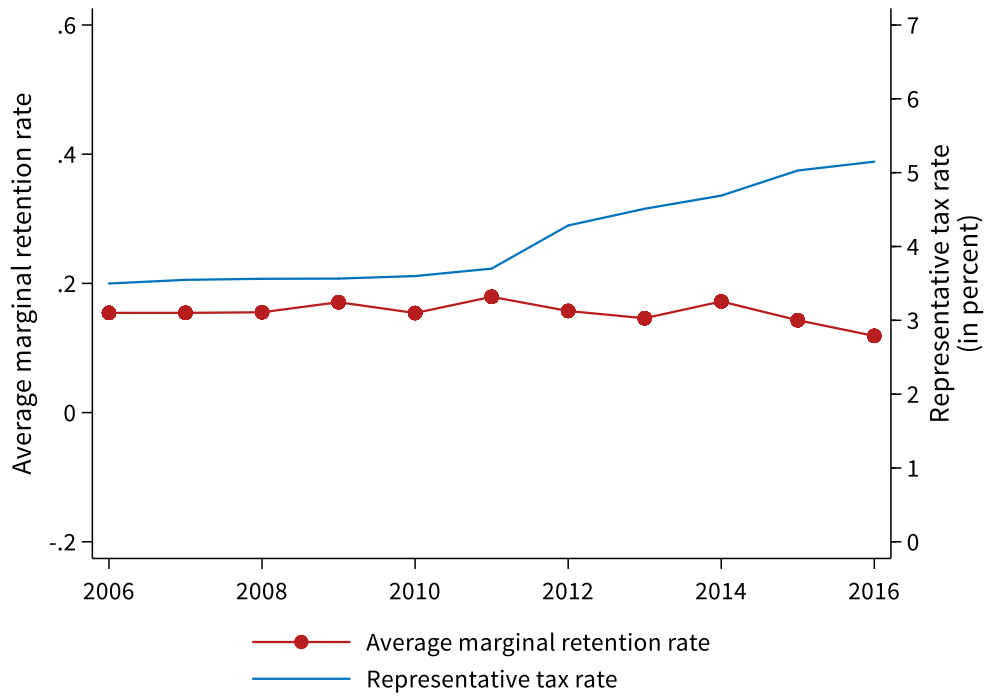
Source: state and press announcements and Wissenschaftlicher Beirat (2015).

Table 6.2: Marginal retention rates of the states in 2006 and 2016

State	2006	2016
<b>Group 1: Increase in the tax rate up to 5 percent</b>		
Baden-Wuerttemberg	0.37	0.37
Hamburg	0.28	0.02
Rhineland-Palatinate	0.05	0.02
Bremen	0.07	-0.02
Mecklenburg-Western Pomerania	0.02	-0.01
Lower Saxony	0.11	0.07
Saxony-Anhalt	0.05	0.00
Thuringia	0.03	0.00
<b>Group 2: Increase in the tax rate to 6 percent or more</b>		
Hesse	0.32	0.43
North Rhine-Westphalia	0.58	0.35
Berlin	0.06	0.18
Brandenburg	0.03	0.22
Schleswig-Holstein	0.04	0.23
Saarland	0.02	0.22
<b>Group 3: No increase in the tax rate</b>		
Bavaria	0.39	0.18
Saxony	0.05	-0.38

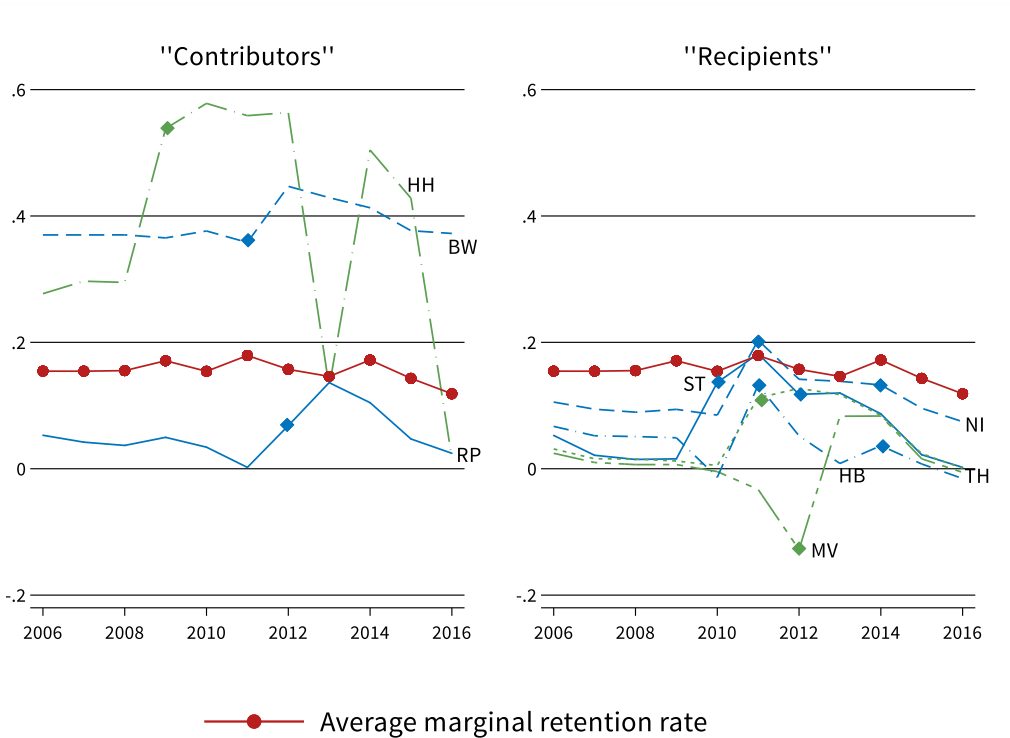
Source: Marginal retention rates (see Equation 3) obtained by own simulation analysis based on the announcements of the (preliminary) fiscal equalization account of the Federal Ministry of Finance for 2006 and 2016.

Figure 6.1: Representative tax rate and average marginal retention rate



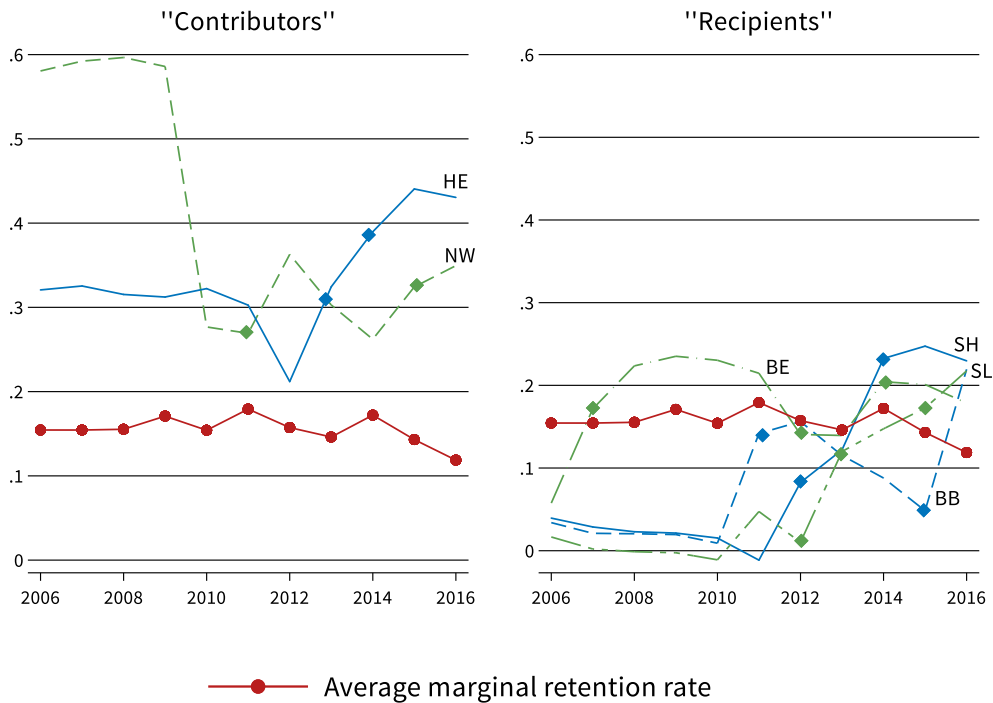
Note: Unweighted average of the marginal retention rates of all states (left scale) and representative tax rate used within the equalization scheme (see Equation 1) (right scale). Source: own calculations.

Figure 6.2: Marginal retention rates for group 1, 2006–2016



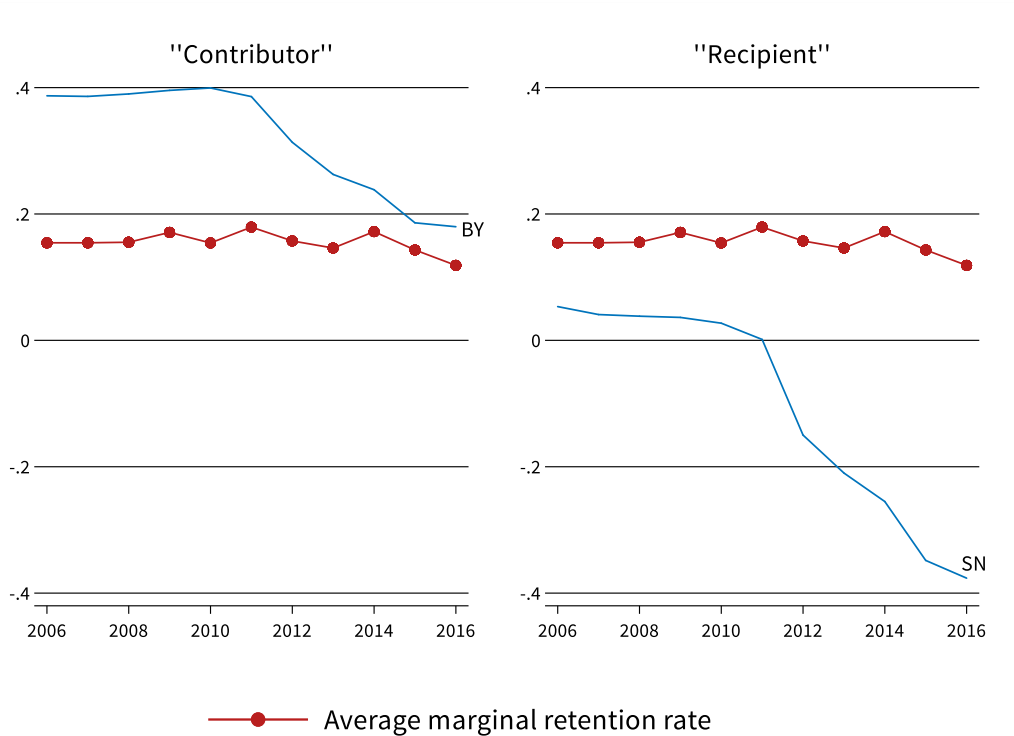
Note: BW = Baden-Wuerttemberg, HH = Hamburg, RP = Rhineland-Palatinate, NI = Lower Saxony, ST = Saxony-Anhalt, TH = Thuringia, HB = Bremen, MV = Mecklenburg-Western Pomerania; marginal retention rates of states with increases in the tax rate up to 5 percent. Diamonds denote the points in time when tax rate increases occurred.  
 Source: own calculations.

Figure 6.3: Marginal retention rates for group 2, 2006–2016



Note: NW = North Rhine-Westphalia, HE = Hesse, SH = Schleswig-Holstein, BB = Brandenburg, SL = Saarland, BE = Berlin; marginal retention rates of states with increases in the tax rate up to 6 percent or more. Diamonds denote the points in time when tax rate increases occurred. Source: own calculations.

Figure 6.4: Marginal retention rates for group 3, 2006–2016



Note: BY = Bavaria, SN = Saxony; marginal retention rates of states with no increases in the tax rate.  
Source: own calculations.





## 7 Fiscal equalization as a driver of tax increases: Empirical evidence from Germany

### Abstract

This chapter exploits a recent devolution of tax setting powers in the German federation to study the effects of fiscal equalization on subnational governments' tax policy. Based on an analysis of the system of fiscal equalization transfers, we argue that the redistribution of revenues provides incentives for states to raise rather than to lower their tax rates. The empirical analysis exploits differences in fiscal redistribution among the states and over time. Using a comprehensive simulation model, we compute the tax-policy incentives faced by each state over the years and explore their empirical effects on tax policy. The results support significant and substantial effects. Facing full equalization, a state is predicted to set the tax rate from the real-estate transfer tax about 1.3 percentage points higher than without. Our analysis also shows that the incentive to raise tax rates is proliferated by the equalization system because the states' decisions to raise their tax rates have intensified fiscal redistribution over time.

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## 7.1 Introduction

A key characteristic of federal public finance is the fiscal autonomy of subnational governments. This includes the discretion to decide about expenditures and to impose local taxes. In federations, this autonomy is often combined with equalization transfers ensuring that all subnational governments have sufficient funding to provide a similar level of public good provision. As Boadway (2004, p. 212) puts it “...equalization can be seen as necessary counterpart to decentralization, offsetting its tendency to create disparities among regions in the ability to provide public goods and services.” However, since fiscal equalization provides jurisdictions with more funds when own revenues decline, fiscal equalization may alter the incentives of subnational governments to raise own source revenues. In particular, receiving states may reduce their own tax effort (*e.g.*, Musgrave 1961). Yet, depending on how fiscal equalization is designed, it may provide incentives to increase rather than lower taxes (*e.g.*, Smart 1998).

In a recent reform, the German federation has aimed to strengthen the autonomy of state governments in taxation and assigned the tax rate of the real-estate transfer tax (RETT) to the discretion of the states. The system of fiscal equalization was left basically unchanged, however. As depicted in Figure 7.1, the reform in 2006 had strong effects on tax policy. In the decade following the reform, the 16 German states have enacted no less than 26 tax increases – no state has lowered its tax rate. Initially, the tax rate was 3.5 percent on the sales price. In some states, the tax rate has almost doubled; in 2017, the mean tax rate has reached a level of 5.4 percent.

The economic literature suggests that the RETT is a rather inefficient tax instrument. Because the tax drives a wedge between the buyer’s and seller’s price, real-estate transactions are deterred and matching efficiency on real estate and labor markets is adversely affected (*e.g.*, Lundborg and Skedinger 1999, Adam et al. 2011, Dachis et al. 2012). The fact that the states have utilized this distortionary tax instrument so heavily may indicate that they are under substantial revenue stress. As we show in this chapter, an alternative explanation is that, rather than simply depressing efforts to raise own source revenues, the combination of tax autonomy and fiscal equalization in Germany actually provides strong incentives to raise the local tax rates.

The incentives of subnational governments for tax policy are the subject of a large body of economic literature (for surveys see Wilson 1999, Keen and Konrad 2013). This literature has emphasized in particular that tax policy of individual governments exerts fiscal externalities on others. If the set of tax instruments is restricted, the resulting tax competition equilibrium is typically characterized by inefficiently low tax rates. The literature has also noted that federal countries have institutions that work in the opposite direction (Keen and Kotsogiannis 2002). In particular, the literature has pointed to the role of fiscal redistribution (*e.g.*, Smart 1998, Köthenbürger 2002, Bucovetsky and Smart 2006). The focus is on the incentives of a specific type of fiscal redistribution implemented by the Australian, the Canadian, the German

as well as the Swiss federations. These countries feature systems of *fiscal capacity equalization* (FCE), where fiscal transfers are a function of fiscal capacity. The latter is typically defined as a sum of own source revenues, where tax revenues with local discretion are not directly included. Rather, revenues from local taxes are standardized to reflect the revenues a state would have collected if the average tax rate is charged on the actual tax base. With fiscal capacity equalization, the adverse impact of a high tax rate on the tax base, which reflects the deadweight loss from taxation, depresses the fiscal capacity of the state. Because this results in higher equalization transfers, states are subject to an incentive to increase the local tax rate and tend to disregard the economic cost of taxation.

The empirical literature on the tax policy incentives of fiscal capacity equalization is relatively scarce. Dahlby and Warren (2003) analyze the effects of fiscal equalization on the incentive of Australian states and territories to raise taxes and note that states that receive more transfers when raising taxes actually tend to impose higher taxes. Evidence for Canada is provided by Smart (2007) who uses an instrumental variable approach to find that tax rates in grant-receiving provinces are higher and more responsive to the tax rates in other provinces. More recently, Ferde (2017) considers the effects of equalization on provincial business and personal income tax rates in Canada. As in Dahlby and Warren (2003), the analysis distinguishes incentives that work through the effects of tax policies on the provincial tax base as well as through the effects on the average (representative) tax rate used to determine fiscal capacity. To identify the effects for grant receiving provinces, Ferde (2017) exploits the discontinuity in the grant allocation formula. The results show that equalization leads to higher tax rates, in particular to higher personal income tax rates, mainly through its base effects.

Despite the strong fiscal redistribution present in the German federation, there are no papers providing evidence on incentive effects exerted on the German states' tax policy. This is, of course, the consequence of the lack of tax autonomy that characterized German states before the recent reform. Barette et al. (2002) as well as Bönke et al. (2017) explore effects of fiscal redistribution on tax collection efforts.

Empirical research has also explored effects of redistributive state grants to German municipalities (e.g., Buettner 2006, Egger et al. 2010, and Rauch and Hummel 2016). While this research generally supports causal effects on local tax policy, the mechanism behind the policy response differs from fiscal capacity equalization. As noted by Dahlby and Warren (2003), in systems of fiscal capacity equalization, the degree of redistribution faced by a jurisdiction is endogenous to tax policy. More specifically, the incentive to raise taxes is also determined by the tax policy of other jurisdictions. Therefore, fiscal capacity equalization may exert much stronger effects on tax policy than the grants to municipalities.

This chapter contributes to the literature on tax policy effects of fiscal equalization by exploring the tax policy of German states after the recent federal reform. By considering the period following the devolution of tax setting powers, the German case provides ideal conditions to

## Fiscal equalization as a driver of tax increases

study how the tax policy incentives from equalization affect subnational tax policy and how the incentives are proliferated through the equalization system. In order to measure the specific tax policy incentive faced by each state we implement a detailed simulation model of the equalization system, which comprehensively captures the developments in all states over the observation period. The model provides measures of the degree of fiscal redistribution and the fiscal position of each state over time, which enables us to distinguish income effects associated with equalization from its incentive effects. Since the degree of fiscal redistribution faced by the individual state partly depends on own tax policy and revenues, we employ instrumental variables based on simulations that keep a state's tax rate and its share of the tax base at pre-reform levels. Controlling for the fiscal position and the associated income effects, the results support a significant and substantial effect of fiscal equalization on a state's tax policy. According to the estimates, with full equalization states set their tax rates from the real-estate transfer tax about 1.3 percentage points higher than without. Our analysis also shows that the incentive to raise tax rates is proliferated by the equalization system as each state's decision to raise the tax rate has increased the incentive of other states to raise their taxes as well.

The following section provides an analysis of tax policy under fiscal equalization. Subsequently, in Section 7.3 the empirical methodology is discussed, and in Section 7.4 the data is described. Section 7.5 presents the results. Section 7.6 concludes.

## 7.2 Tax policy under fiscal equalization

This section provides a stylized analysis of optimal tax policy in the presence of fiscal capacity equalization (FCE). For simplicity, the revenues  $R_i$  of a state  $i$  are assumed to consist of three components

$$R_i = T_i + \tau_i B_i + Z_i .$$

One component is revenue from shared taxes  $T_i$ , the second component is revenue from the local tax and the third component is a fiscal transfer.

A capacity-based fiscal equalization scheme defines the transfers using a function of the relative fiscal position  $S_i$  of a state  $i$

$$Z_i = Z(S_i), \quad \text{where } Z'_i < 0 \text{ and } \begin{cases} Z_i > 0 & \text{if } S_i < 1 \\ Z_i = 0 & \text{if } S_i = 1 \\ Z_i < 0 & \text{if } S_i > 1. \end{cases}$$

The relative fiscal position is defined as

$$S_i = \frac{C_i}{\frac{1}{n} \sum C_j},$$

which relates the fiscal capacity  $C_i$  of state  $i$  to the average capacity in all  $n$  states. Hence, the transfer is positive if capacity is below ( $S_i < 1$ ) and negative if capacity is above average ( $S_i > 1$ ).

In the German case, fiscal capacity is basically defined as

$$C_i = T_i + \bar{\tau}B_i,$$

where  $T_i$  is revenue from shared taxes, and  $\bar{\tau}B_i$  is standardized revenue from the local real-estate transfer tax with  $B_i$  denoting the taxable base and  $\bar{\tau}$  denoting the weighted average of tax rates

$$\bar{\tau} = \frac{\sum \tau_j B_j}{\sum B_j}. \quad (1)$$

Function  $Z_i$  is strictly decreasing in  $S_i$  and has zero value at  $S_i = 1$ . This implies that a state that receives transfers ( $S_i < 1, Z_i > 0$ ) experiences a decrease in transfers if the relative fiscal position  $S_i$  increases.<sup>1</sup>

In a purely redistributive system, the sum of transfers  $\sum Z_j$  would be equal to zero. In the terminology of Boadway (2004), such a system would be a “net scheme”. However, the German federation runs a “gross scheme”, where no such constraint is imposed, because resources are transferred from the federal to the state level in order to fund the equalization scheme.<sup>2</sup>

The effect of an increase in the own tax rate on total revenues is

$$\frac{\partial R_i}{\partial \tau_i} = B_i + \tau_i \frac{\partial B_i}{\partial \tau_i} + Z'(S_i) \frac{\partial S_i}{\partial \bar{\tau}} \left( \frac{B_i}{\sum B_j} \right) + Z'(S_i) \frac{\partial S_i}{\partial B_i} \frac{\partial B_i}{\partial \tau_i},$$

where the first two terms reflect direct and indirect effects on own revenues and the other two terms describe the change in transfers due to changes in fiscal capacity  $S_i$ . Denoting the tax-rate elasticity of the taxable base with  $\eta_i$  the equation can be simplified to obtain

$$\frac{\partial R_i}{\partial \tau_i} = B_i(1 + \rho_i) - B_i \eta_i (1 - \beta_i). \quad (2)$$

The effect of fiscal equalization is captured by two parameters:  $\beta_i$  and  $\rho_i$ .  $\beta_i$  is a measure of fiscal redistribution of a change in revenues due to a change in the tax base. Formally defined as

<sup>1</sup> In the German case, the derivative of the function is discontinuous, *i.e.*, there exist threshold levels  $\sigma$  such that  $\lim_{S_i \rightarrow \sigma^-} Z'(S_i) \neq \lim_{S_i \rightarrow \sigma^+} Z'(S_i)$ . For the discontinuity in the Canadian system, see Ferede (2017).

<sup>2</sup> Depending on how the federal government is funded, a change in federal transfers also has effects on the taxpayers in the state. Ultimately, this may also affect tax policy in state  $i$ . However, we abstract from those effects in the theoretical analysis.

## Fiscal equalization as a driver of tax increases

$$\beta_i = -\left(Z'(S_i) \frac{\partial S_i}{\partial B_i} / \tau_i\right) > 0, \quad (3)$$

it captures the fraction of an increase in revenues due to a higher tax base that is compensated through transfers. This effect has been dubbed *equalization base effect* (Dahlby and Warren 2003). Since the relative fiscal position increases with the tax base,  $-Z'(S_i) \partial S_i / \partial B_i$  determines the loss in transfers given an increase in the tax base. Dividing this loss in transfers by the tax rate relates the change in revenues to the direct revenue effect from an increase in the tax base. If  $\beta_i$  is close to zero, a higher tax base has little impact on transfers and the revenue gain from an increase in the tax base is mainly kept by the state. If  $\beta_i$  is close to unity, a higher tax base results in a strong decline in fiscal transfers. In this case, the net revenue impact of an increase in the tax base is small. If  $\beta_i$  exceeds unity, a higher tax base would result in net-revenue losses. While such heavy redistribution seems hard to justify, it cannot be ruled out for practical applications. If the state is net contributor ( $Z_i < 0$ ), an increase in the tax base is associated with a higher contribution. In this case  $\beta_i$  measures the extent to which a revenue increase due to a higher tax base is compensated by higher contributions.

With regard to the revenue effect of a tax-rate increase in Equation (2),  $\beta_i$  tends to reduce the revenue implication of the adverse effect of higher taxes on the tax base. As a consequence, the higher  $\beta_i$  the larger is the revenue gain from higher taxes.

The second parameter characterizing fiscal equalization,  $\rho_i$ , is a measure of fiscal redistribution of a change in revenues due to the tax rate at a given tax base. Dahlby and Warren (2003) call this the *equalization rate effect*. Formally defined as

$$\rho_i = \left( Z'(S_i) \frac{\partial S_i}{\partial \bar{\tau}} \left( \frac{B_i}{\sum B_j} \right) / B_i \right), \quad (4)$$

it captures the fraction of an increase in revenues due to a higher tax rate at a given tax base that is compensated through transfers. The effect of the local tax rate on the average (representative) tax rate at a given tax base is determined by the share in the total tax base ( $B_i / \sum B_j$ ). Hence, any increase in the tax rate raises the average tax rate. However, whether this contributes to an increase in the relative fiscal capacity or not depends on the fraction of the standardized tax revenues in fiscal capacity in state  $i$  relative to all other states.<sup>3</sup> The parameter  $\rho_i$  scales the effect on transfers with the actual tax base  $B_i$  in order to relate the change in revenues from transfers to the “mechanical” revenue effect of an increase in the tax rate.

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<sup>3</sup> Note that  $\frac{\partial S_i}{\partial \bar{\tau}} = S_i \left[ \frac{B_i}{C_i} - \frac{\sum_j B_j}{\sum_j C_j} \right]$ .

If states with low fiscal capacity have also a low share of the tax in total capacity,  $\partial S_i / \partial \bar{\tau} < 0$ . In this case, a state that receives transfers, would see a decline in its fiscal position when the average tax rate rises  $\partial S_i / \partial \bar{\tau} < 0$ . As this decline triggers more transfers,  $\rho_i$  would be positive.

If  $\rho_i$  is close to zero, a higher tax rate has little direct impact on transfers and the mechanical revenue gain from an increase in the tax rate at a given tax base is mainly kept by the state. If  $\rho_i$  is positive (negative), the net revenue impact of an increase in the tax rate at a given tax base is larger (smaller) than the mechanical revenue gain. Hence, the revenue effect of a tax increase in Equation (2) increases with a positive and decreases with a negative  $\rho_i$ .

To discuss the implications of fiscal equalization for tax policy we assume that the incidence of the RETT is on the local constituency and consider the marginal cost of public funds<sup>4</sup>

$$MCF_i = B_i \left( \frac{\partial R_i}{\partial \tau_i} \right)^{-1} = \frac{1}{(1 + \rho_i) - \eta_i(1 - \beta_i)}.$$

In the absence of fiscal redistribution,  $\beta_i = 0$ ,  $\rho_i = 0$ , the marginal cost of funds is simply an increasing function of the elasticity of the tax base. With fiscal redistribution,  $\beta_i > 0$  and the marginal cost of funds is reduced. This provides an incentive to expand public consumption and to increase tax rates. With  $\beta_i = 1$  and  $\rho_i = 0$ , the marginal cost of funds would be unity. In this case, the tax would effectively be perceived as a lump-sum tax.<sup>5</sup> If  $\beta_i > 1$ , the marginal cost of funds may even be smaller than unity. If the equalization rate effect  $\rho_i$  is positive, the marginal cost of funds declines. This is intuitive since a tax-rate increase would then weaken the fiscal position and more fiscal transfers are obtained.

While we have focused on how the equalization transfers that are received or paid by a state are affected by the choice of the local tax rate of this state, the transfers also depend on the tax policy decisions in other states. Even if there are no direct tax externalities, such that the tax base in one state is unaffected by the local tax rate in other states  $\partial B_i / \partial \tau_j = 0$ , other states' tax policies exert effects: the relative fiscal position and the average tax rate both depend on the tax rates and tax bases in all other states. Hence, the parameters  $\rho_i$  and  $\beta_i$  vary with the tax policies in other states.

### 7.3 Empirical methodology

In the empirical analysis, we consider the states' tax policies after a federal reform that granted the states the right to set the tax rate of the real-estate transfer tax (RETT). The analysis exploits the fact that the degree of fiscal redistribution differs among the states and over time.

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<sup>4</sup> Note that we discuss the marginal cost of public funds from the perspective of a state government. The perspective of the federation might be different, see Wildasin (1989).

<sup>5</sup> Bucovetsky and Smart (2006) show that with full equalization  $\beta_i = 1$ , the incentive to engage in horizontal tax competition is eliminated.



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The empirical analysis focuses on the choice of the RETT rate. Basically, it is concerned with the relationship between the tax rate and precise indicators of fiscal equalization. This includes the degree of fiscal redistribution associated with the tax base  $\beta_i$  and with the tax rate  $\rho_i$ . Based on the theoretical discussion, we assume that if the degree of fiscal redistribution is high, a state is more likely to increase its tax rate. Since the tax policy is required to set the tax rate in advance, state governments base their tax decisions for the upcoming period on the realization of fiscal capacity and on the realized degree of fiscal redistribution.<sup>6</sup> This suggests to use the following specification

$$\Delta\tau_{i,t+1} = \alpha_i + b_1\beta_{i,t} + b_2\rho_{i,t} + \sum_{j=1}^p b_{3,j}S_{i,t}^p + \gamma_t + \varepsilon_{i,t} \quad (5)$$

where  $\alpha_i$  is a fixed state effect and  $\gamma_t$  is a fixed time effect for period  $t$ . The latter captures common trends in the German federation.  $b_1$  and  $b_2$  capture the effects of fiscal redistribution. In the light of the above analysis, positive coefficients are expected as the marginal cost of funds is reduced when  $\beta_i$  and  $\rho_i$  increase.

The identification strategy utilizes the fact that the equalization transfers are formula based and are determined by a smooth function of relative fiscal capacity. By allowing for arbitrary non-linear effects of the assignment variable  $S_{i,t}^p$ , the estimation approach ensures that only differences in the degree of fiscal redistribution conditional on the fiscal position of a state are used to identify the incentive effects of fiscal equalization. Thereby, we make sure that the variation in the degree of fiscal redistribution is not capturing differences in available resources and in the amount of equalization transfers. This is important, since the fiscal equalization transfers received, or paid, exert income effects on tax policy. Without controls for relative fiscal capacity, empirical responses to the indicators of the degree of fiscal redistribution would capture not only the incentive but also these income effects. To allow for slow adjustment in tax policy, we also provide results of specifications that condition on the current tax rate.<sup>7</sup>

As shown above, the degree of fiscal redistribution of RETT revenues is partly determined by local tax policies. To avoid potential biases, we employ instrumental variables. The instruments used are measures of degree of fiscal redistribution  $\hat{\beta}_{i,t}$  and  $\hat{\rho}_{i,t}$  faced by state  $i$  in period  $t$  computed by counterfactual simulations, *i.e.*, based on simulations that keep a state's

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<sup>6</sup> The first preliminary account of equalization transfers for a budget year is typically published by the Federal Ministry of Finance in January of the next year. Detailed revenue forecasts for the current budget year are available not before November when the federal forecast of tax revenues for the current year is issued.

<sup>7</sup> Since the dimension of the data covers a limited time period, accurate estimations of the adjustment speed may be difficult due to the Nickell (1981) bias. Since also the cross-sectional dimension is limited, however, we decided against using GMM methods that rely on large  $n$  asymptotics.

tax rate and share of the tax base at pre-reform levels. In other words, as instrumental variables we use indicators of the degree of fiscal redistribution that a state would face if it had not used its newly assigned discretion to set the tax rate and, thus, has kept the tax rate at the pre-reform level. To this end, we fix the state  $i$ 's tax rate at the pre-reform level. Moreover, to avoid capturing indirect tax policy effects on the tax base we also fix the state's share in the total tax base  $B_i/\sum B_j$  at the pre-reform level of the year 2006. Thus, the variation in the indicators used as instrumental variables derives from changes in the fiscal equalization system independent of the tax policy in the respective state. Since we condition on the relative fiscal capacity  $S_{i,t}^p$ , income effects from fiscal equalization are captured, and the instrumental variable should not exert any separate influence on tax policy, *i.e.*, the exclusion restriction of the instrumental variable is unlikely to be violated.

## 7.4 Data

The empirical analysis examines the choice of the tax rate under fiscal capacity equalization. It explores how German states responded with their tax rates after they received the right to set the tax rate of the RETT and, in particular, whether the tax policy response differs depending on the tax policy incentives associated with fiscal capacity equalization as discussed in Section 7.2. The analysis explores the tax policy decisions of the states in the period from 2007 to 2017.<sup>8</sup> To identify differences in fiscal equalization we exploit the institutional details of fiscal equalization among German states. Therefore, the next subsection provides a brief discussion of fiscal equalization. Subsequently, descriptive statistics on tax rates and indicators of tax policy incentives are provided.

### 7.4.1 Fiscal equalization in Germany

The German system of fiscal equalization consists of different stages of vertical and horizontal distribution of funds. The first stage involves the distribution of VAT revenue shared between the federal and the state governments. The states' share is distributed mainly according to population size but a fraction is used to provide funds to states with low fiscal capacity, *i.e.*, to states with own tax revenues below average. At this stage, fiscal capacity is calculated without VAT revenues. The second stage consists of a horizontal redistribution scheme with transfers paid to states with fiscal capacity (including VAT) below fiscal need and contributions made by states with fiscal capacity above fiscal need. The latter is the population-weighted average of fiscal capacity across states. The third stage uses the same measure of fiscal capacity and provides further vertical transfers by the federal government to states with fiscal capacity below fiscal need.

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<sup>8</sup> The observation period covers 26 tax-rate changes. In 2018, no state has changed the tax rate.

## Fiscal equalization as a driver of tax increases

At all stages, real-estate transfer taxes are accounted for. Rather than using the revenues directly, the equalization system uses standardized tax revenues for its definition of fiscal capacity. The standardization involves applying the average tax rate, which is the weighted average of actual tax rates (see Equation 1), to the tax base of the real-estate transfer tax. Despite the massive tax rate increases, the share of standardized revenues from the RETT in the states' aggregate fiscal capacity amounts to less than 5 percent (2016).

Using data for 2016, Figure 7.2 reports the indicator of fiscal capacity relative to fiscal need ( $S_i$ ) and the resulting level of transfers in per-capita terms. As the figure shows, transfers are a decreasing function of relative fiscal capacity. The relationship between transfers and fiscal capacity is obviously non-linear. Three segments can be distinguished. A first segment shows high transfers and a limited degree of fiscal redistribution. An intermediate segment displays a stronger degree of redistribution and medium level of transfers. States with capacity above average fall in a third segment. It comprises states providing net contributions.

To compute indicators of the degrees of fiscal redistribution, we simulate the fiscal equalization scheme based on the full account of the various tax revenues collected by each of the states in each year. All three stages of fiscal equalization are taken into account. In terms of the above stylized model of fiscal equalization, the simulations provide us with values for  $\beta_i$  and  $\rho_i$  for each state in each year. To compute  $\beta_i$  we consider the effect of a shock to the tax base of a single state  $i$  on the transfers received by this state. The shock is scaled such as to generate a tax revenue increase by 1 million euro at the average tax rate.  $\rho_i$  is obtained by considering the effects of a change in the tax rate of state  $i$  by 1 percentage point.

Table 7.1 provides degrees of fiscal redistribution and other indicators by state in 2006 and 2016 ordered by groups of states and population size. Columns (1) and (2) depict the population share and the relative fiscal capacity in 2016. Columns (3) and (4) show the tax rates in 2006 and 2016 of the respective state. Column (5) reports the degree of fiscal redistribution of a change in revenues due to the tax base ( $\beta_i$ ) based on the tax revenues in 2006, *i.e.*, before the federal reform. It displays marked variation in several dimensions. The majority of small states (Saxony, Rhineland-Palatinate, Berlin, Schleswig-Holstein, Brandenburg, Saxony-Anhalt, Thuringia, Mecklenburg-Western Pomerania, Saarland, Bremen) has also low fiscal capacity. For these states, the degree of fiscal redistribution ( $\beta_i$ ) is quite high in 2006. In all these cases, it shows figures above 0.9. This indicates that a shock in the tax base of the real-estate transfer tax generating a euro of additional tax revenues results in an increase of funds net of redistribution by less than 10 cents. 90 cents are compensated by a reduction in equalization transfers. A second group of states is relatively large and shows high levels of fiscal capacity (Bavaria, Baden-Wuerttemberg, Hesse). For these states, the degree of fiscal redistribution is much lower showing figures below 0.7, indicating that a shock in the tax base of the real-estate transfer tax generating a euro of additional tax revenue results in an increase of funds net of redistribution by more than 30 cents. A last group of states either is relatively large or has

large fiscal capacity (North Rhine-Westphalia, Lower Saxony, Hamburg). Here the degree of fiscal redistribution varies but is lower than for the first group.

The figures for 2016 look very different (see Column 6). Though the system of fiscal equalization is the same, for some states  $\beta_i$  has increased, for others it has declined. It seems that the changes are mainly the consequence of changes in tax rates. States that have increased their tax rate the most, such as Berlin, Brandenburg and Saarland, face a decline in fiscal redistribution relative to 2006. The two states that have not increased their tax rate experience an increase in the degree of fiscal redistribution (Saxony and Bavaria). Most notably in Saxony the degree of fiscal redistribution is above 1 in 2016. With a degree of fiscal redistribution of about 1.40, the state loses transfers for each euro of additional tax revenues in an amount of 1.40 euro. Hence, at the margin, the state's revenues decline by 40 cents with every additional euro of revenues from the real-estate transfer tax. This extreme level of redistribution<sup>9</sup> is not observed for any other state in 2016. However, Bremen and Mecklenburg-Western Pomerania also show degrees of fiscal redistribution above 1.

Columns (7) and (8) report the degree of fiscal redistribution of a change in revenues due to the tax rate (given the tax base) ( $\rho_i$ ) based on data for 2006 and 2016. It shows little variation and is in most cases very close to zero. This indicates that the fiscal redistribution of the mechanical revenue effects from a tax rate change is very small. Hence, the equalization rate effect is unimportant in the case of the German RETT.

Figure 7.3 depicts the evolution of the degree of fiscal redistribution of tax base effects over time. The figure reports the actual degree of fiscal redistribution of revenue effects of a shock in the tax base. Accordingly, in 2006 the degree of redistribution of a tax-base shock varies between 0.4 and 1. The mean and the variance of the degree of fiscal redistribution tend to increase over time.

While the actual degree of redistribution is affected by the own choice of the tax rate, Figure 7.4 reports the development based on the counterfactual simulations. These simulations are based on the assumption that the tax rate and the share in the tax base of the state under consideration have stayed constant at the pre-reform level. The distribution shows less fluctuations, but the degree of fiscal redistribution shows a clear positive trend for all states. During the observation period, if a state had not changed its tax rate, the degree of fiscal redistribution of tax base effects for this state has, on average, grown by about a third.

#### 7.4.2 Descriptive statistics

Table 7.2 provides descriptive statistics for the tax rates and the two key variables of interest, *i.e.*, the degrees of fiscal redistribution with regard to the tax base and the tax rate, as well as

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<sup>9</sup> The fact that there is more than 100 percent redistribution has been noted in the German debate, see, for instance, Boysen-Hogrefe (2017) and Buettner and Krause (2018) – see also Chapter 6.

for control variables. The latter group includes the indicator of relative fiscal capacity and the population size. The table also includes indicators for the relative fiscal capacity excluding VAT, which is used in the first stage of fiscal equalization. It is included in the subsequent analysis since the first stage of the equalization scheme exerts separate income effects.

### 7.5 Results

Results from a basic set of OLS regressions are provided in Table 7.3. Given the very small degree of redistribution of revenue effects from tax rate changes ( $\rho_i$ ), it focuses on the redistribution of the tax base. The first specification includes only the degree of fiscal redistribution ( $\beta_i$ ). It shows a significant positive effect. The next three specifications include indicators of the assignment variable, *i.e.*, of relative fiscal capacity. Even though the higher-order terms improve the fit of the regression, the degree of fiscal redistribution exerts a similar effect on the tax policy. According to specifications (5) to (7) the positive effect of fiscal redistribution is robust against inclusion of relative fiscal capacity excluding VAT – an indicator that captures assignment in the first stage of equalization. In order to allow for some adjustment in the tax rate in the first years after the devolution of the right to set the own tax rate, Column (8) adds the current level of the tax rate. Hence, this specification considers tax policy for the upcoming period, conditional on the current choice of the tax rate. With this control added, the degree of fiscal redistribution is still found to exert a significant positive effect, but the effect turns out to be smaller. This supports the view that the effect of the actual degree of fiscal redistribution is confounded by the current tax policy.

Results from IV estimates are provided in Table 7.4. The estimations employ a measure of the degree of fiscal redistribution ( $\hat{\beta}_i$ ) as an instrumental variable that is based on counterfactual simulations. It captures the degree of redistribution faced by the state if its tax rate and its share of the tax base had stayed unchanged at the pre-reform level. For all specifications, the first stage F-statistic for the excluded instrument provided at the bottom of the table indicates that the counterfactual simulation provides a strong predictor of the actual degree of fiscal redistribution. Compared with the OLS results, the results point to somewhat smaller effects of fiscal redistribution on tax policy.

Quantitatively, the point estimate provided by Column (7) suggests that in presence of full fiscal redistribution of tax-base shocks ( $\beta = 1$ ) the tax rate is by about 1.3 percentage points higher compared with a hypothetical situation, where fiscal redistribution is absent ( $\beta = 0$ ).

The analysis has focused on the redistribution of tax base effects. Table 7.5 provides results of specifications that also include the indicator of the degree of fiscal redistribution associated with the tax rate effect. While the above findings are confirmed, no significant effect is found for this second indicator.

Since the estimations condition on the fiscal position of a state, the effect found for fiscal redistribution suggests that the remarkable series of tax increases after the reform in 2006 cannot be explained simply with lack of funds but results from the incentive effect of fiscal redistribution. To test whether fiscal distress associated with the level of public debt may partly explain the tax policy, we have conducted robustness checks where the level of public debt per capita is added as a control (see Table 7.6). Even though per-capita debt shows a small positive effect, it does not turn out to be statistically significant and the estimates of the effect of fiscal redistribution show qualitatively similar effects as above.

### 7.6 Summary and conclusions

This chapter has explored the German states' tax policy response to a recent reform, which involves the devolution of tax setting powers to the German states. More specifically, starting in 2007 German states used the right to choose the tax rate of the real-estate transfer tax. This reform resulted in an unprecedented wave of tax increases. In the time period from 2007 to 2017 among the 16 German states, no less than 26 tax increases occurred. No state has lowered its tax rate. Initially, the tax rate was 3.5 percent on the sales price. In 2017, the mean tax rate is 5.4 percent.

As we argue in this chapter, due to a system of fiscal capacity equalization, the German states' tax policy is subject to strong incentives to increase the tax rates of the real-estate transfer tax. Following Dahlby and Warren (2003), we identify two separate incentives for tax policy. The first incentive is associated with the effect of the tax rate on the tax base. Given the way fiscal capacity is defined, the adverse impact of a high tax rate on the tax base, which reflects the deadweight loss from taxation, contributes to a decline in fiscal capacity. Hence, a state that raises its tax rate, receives more rather than less equalization transfers or, if it is a state with high fiscal capacity, needs to make lower transfers to other states. A second incentive effect can arise, since each state's tax policy decision is reflected in the average tax rate that is used by the equalization system to determine fiscal capacity.

To test whether these incentive effects have led the states to increase their tax rate in the recent years, we use a simulation analysis of the system of fiscal equalization and precisely compute the incentives faced by each state in each period. The identification strategy exploits differences in the degree of fiscal redistribution among the states and over time. To distill the incentive effects empirically, we comprehensively control for income effects of fiscal redistribution by indicators of the relative fiscal capacity. To overcome possible confounding effects of own policies on the incentive effect we use an instrumental variables approach. More specifically, by means of counterfactual simulations we compute indicators of the degree of fiscal redistribution that keep a state's tax rate and its share of the tax base at pre-reform levels, which are used as instrumental variables.

## Fiscal equalization as a driver of tax increases

The results support a robust significant effect of fiscal redistribution on tax policy. According to the point estimates, with full equalization of tax revenues, the tax rate for the real-estate transfer tax is about 1.3 percentage points higher than without. This sizeable incentive effect is exclusively associated with the fiscal redistribution of the tax base. The equalization rate effect is unimportant in the German context.

Given that the German states were mostly subject to almost full equalization when the reform was implemented, the incentive provided by tax base equalization can explain a substantial part of the recent tax increases by German states. In addition, however, the basic incentive effect to raise the own tax rate has been proliferated by the equalization system. As states responded to the tax policy incentive by setting higher tax rates, the strength of the incentive faced by a state has been increasing over time. Hence, the first wave of tax increases raised the incentive to increase tax rates and triggered further tax increases.

Our findings point to the importance of a careful design of federal fiscal institutions. Combining a high degree of fiscal redistribution with a decentralized distortionary tax likely results in an inefficient tax structure.

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## Appendix

### A Data sources and definitions

**Population size:** the population size is the total amount of population in each state on June 30 of each year. Source: Federal Ministry of Finance (Annual announcements of the fiscal equalization account, (*Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes*, various years)).

**Tax rate of the real-estate transfer tax (in percent):** the tax rate is the rate of the real-estate transfer tax in percent applicable to land transactions. In cases where the tax rate has been changed within a year, the annual figure is interpolated based on the exact calendar days. Source: announcements of the 16 German states.

**Tax base of the real-estate transfer tax (in 1,000 euro):** the tax base of the real-estate transfer tax is basically the sale price of the property. Source: Federal Ministry of Finance (Annual announcements of the fiscal equalization account, (*Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes*, various years)).

**Relative fiscal capacity:** relative fiscal capacity is defined as fiscal capacity relative to fiscal need for each state. Fiscal capacity is defined as available revenues including state's own tax revenues, the share of income taxes, the VAT share and municipal tax revenues. Fiscal need is the population weighted average of fiscal capacity across states. Source: Federal Ministry of Finance (Annual announcements of the fiscal equalization account, (*Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes*, various years)) and own calculations.

**Relative fiscal capacity (excl. VAT):** relative fiscal capacity excluding revenues from VAT as used in the first stage of the equalization system to determine the VAT distribution. Source: Federal Ministry of Finance (Annual announcements of the fiscal equalization account, (*Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes*, various years)) and own calculations.

**Degree of fiscal redistribution (tax base  $\beta$ ):** the degree of fiscal redistribution captures the fraction of an increase in revenues due to a higher tax base that is compensated through transfers. The state-specific shock in the tax base of the RETT is scaled such as to generate a tax revenue increase by 1 million euro at the average tax rate in all states and periods. Source: own simulation analysis.

**Degree of fiscal redistribution (tax rate  $\rho$ ):** the degree of fiscal redistribution captures the fraction of an increase in revenues due to a higher tax rate (at a given tax base) that is compensated through transfers. The state-specific shock in the tax rate of the RETT is an increase by 1 percentage point. Source: own simulation analysis.

## Fiscal equalization as a driver of tax increases

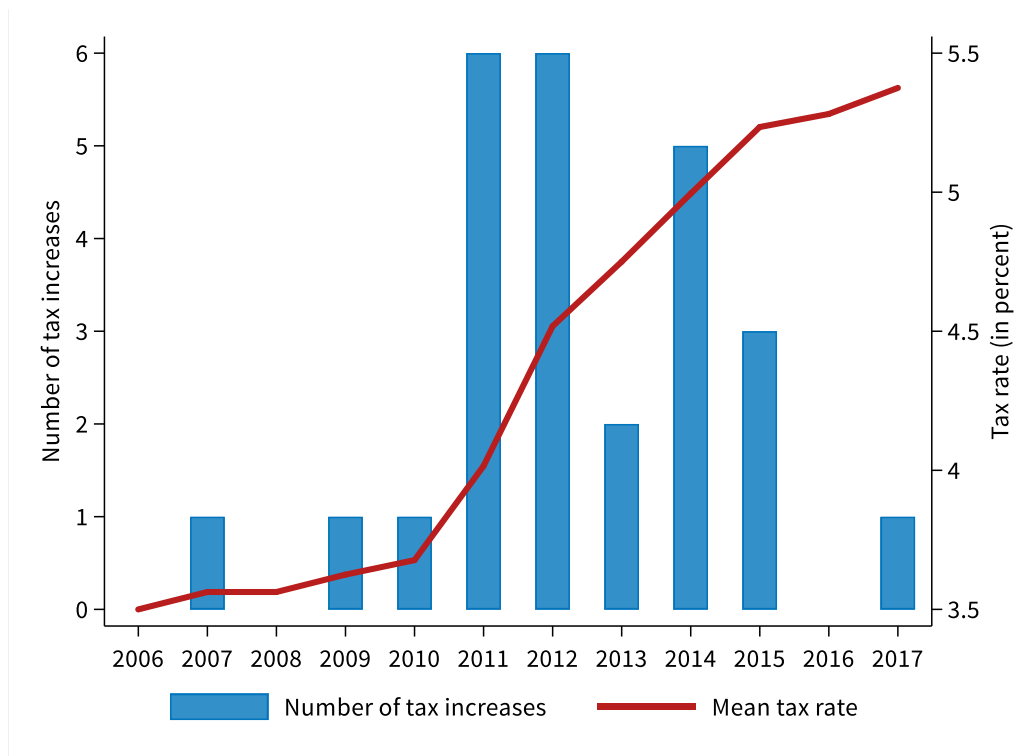
**Counterfactual degree of fiscal redistribution (tax base  $\hat{\beta}$ ):** the counterfactual degree of fiscal redistribution captures the fraction of an increase in revenues due to a higher tax base that is compensated through transfers. It is calculated under the assumption that the respective state's tax rate and its share of the total tax base have remained at the pre-reform level in the year 2006. The state-specific shock in the tax base of the RETT is scaled such as to generate a tax revenue increase by 1 million euro at the average tax rate. Source: own simulation analysis.

**Counterfactual degree of fiscal redistribution (tax rate  $\hat{\rho}$ ):** the counterfactual degree of fiscal redistribution captures the fraction of an increase in revenues due to a higher tax rate that is compensated through transfers. It is calculated under the assumption that the respective state's tax rate and its share of the total tax base have remained at the pre-reform level in the year 2006. The state-specific shock in the tax rate of the RETT is an increase in the tax rate of 1 percentage point. Source: own simulation analysis.

**Public debt per capita (in 1,000 euro):** public debt per capita is the total level of state debt held by private and public sectors in 1,000 euro measured in per-capita terms. Source: federal statistical office.

**B Tables and Figures**

**Figure 7.1: Real-estate transfer tax rate increases among the German states**

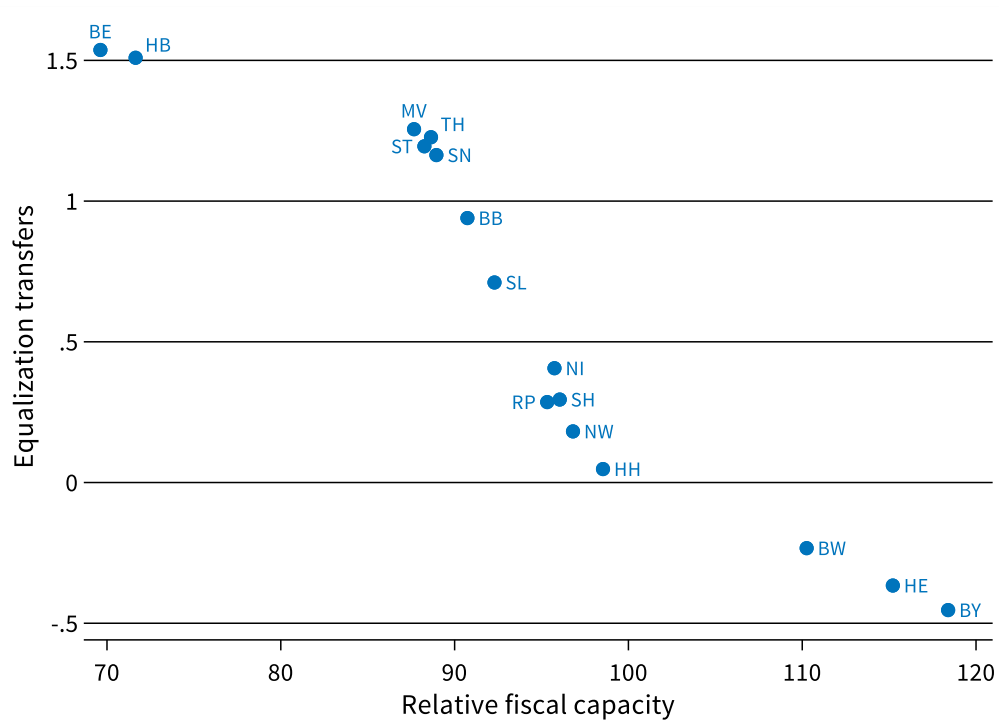


Note: Number of tax rate increases by the 16 German states in the years after the 2006 reform (left axis) and unweighted tax-rate average (right axis) by year. In 2006, all states were required to charge a tax rate of 3.5 percent.

Source: own calculations.

## Fiscal equalization as a driver of tax increases

Figure 7.2: Equalization transfers and relative fiscal capacity



Note: Equalization transfers in 1,000 euro per capita. This includes the distribution of the VAT share (*Ergänzungsanteile*) at the first stage, the horizontal transfers (*Ausgleichszuweisungen/Ausgleichsbeiträge*) at the second stage, as well as the federal transfers (*Allgemeine Bundesergänzungszuweisungen*) at the third stage of fiscal equalization. Relative fiscal capacity is the fiscal capacity in percent of fiscal need according to the second stage of the fiscal equalization system. BW = Baden-Wuerttemberg, BY = Bavaria, BE = Berlin, BB = Brandenburg, HB = Bremen, HH = Hamburg, HE = Hesse, MV = Mecklenburg-Western Pomerania, NI = Lower Saxony, NW = North Rhine-Westphalia, RP = Rhineland-Palatinate, SL = Saarland, SN = Saxony, ST = Saxony-Anhalt, SH = Schleswig-Holstein, TH = Thuringia.

Source: own computations based on data for 2016.

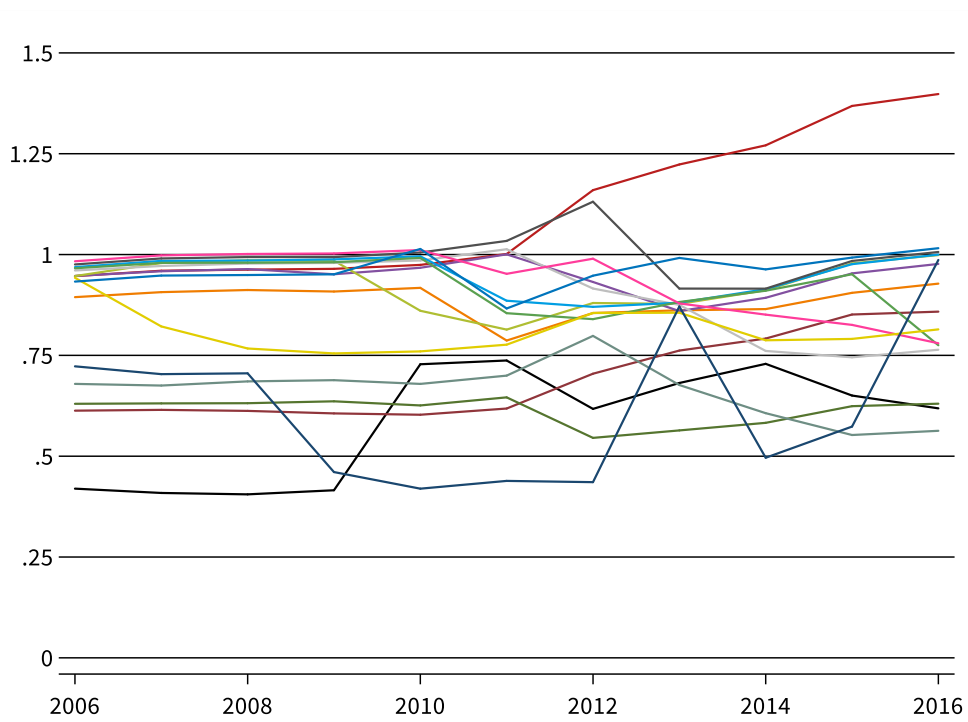
Table 7.1: Fiscal redistribution by state in 2006 and 2016

Year	Fiscal equalization							
	Popul. share	Rel. fiscal capacity ( $S_i$ )	Tax rate ( $\tau_i$ )		Base effect ( $\beta_i$ )		Rate effect ( $\rho_i$ )	
	2016	2016	2006	2016	2006	2016	2006	2016
State	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Saxony	4.97	88.95	3.5	3.5	0.95	1.40	-0.02	-0.01
Rhineland-Palatinate	4.93	95.33	3.5	5.0	0.95	0.98	-0.01	-0.01
Berlin	4.28	69.62	3.5	6.0	0.94	0.81	0.03	0.02
Schleswig-Holstein	3.48	96.05	3.5	6.5	0.96	0.76	0.01	0.00
Brandenburg	3.02	90.74	3.5	6.5	0.97	0.78	-0.01	-0.01
Saxony-Anhalt	2.73	88.26	3.5	5.0	0.95	1.00	-0.01	-0.01
Thuringia	2.64	88.64	3.5	5.0	0.97	1.00	-0.02	-0.02
Mecklenburg-Western Pomerania	1.96	87.67	3.5	5.0	0.98	1.01	-0.01	-0.00
Saarland	1.21	92.29	3.5	6.5	0.98	0.78	-0.00	-0.00
Bremen	0.82	71.65	3.5	5.0	0.93	1.02	-0.00	-0.00
Bavaria	15.63	118.39	3.5	3.5	0.61	0.86	0.01	0.04
Baden-Wuerttemberg	13.24	110.25	3.5	5.0	0.63	0.63	0.00	0.00
Hesse	7.52	115.21	3.5	6.0	0.68	0.56	0.02	0.01
North Rhine-Westphalia	21.74	96.81	3.5	6.5	0.42	0.62	0.01	-0.02
Lower Saxony	9.65	95.75	3.5	5.0	0.89	0.93	-0.02	-0.02
Hamburg	2.18	98.54	3.5	4.5	0.72	0.99	0.01	0.01

Note: Population share and fiscal position (relative fiscal capacity) in percent obtained from the announcements of the fiscal equalization account of the Federal Ministry of Finance. Relative fiscal capacity defined as fiscal capacity (*Finanzkraftmesszahl*) relative to fiscal need (*Ausgleichsmesszahl*) in percent. Tax rates obtained from state announcements. Degree of fiscal redistribution  $\beta_i$  for a state-specific shock in the tax base of the RETT (see Equation 3) obtained by own simulation analysis. Degree of fiscal redistribution  $\rho_i$  for a state-specific shock in the tax rate of the RETT (see Equation 4) obtained by own simulation analysis.

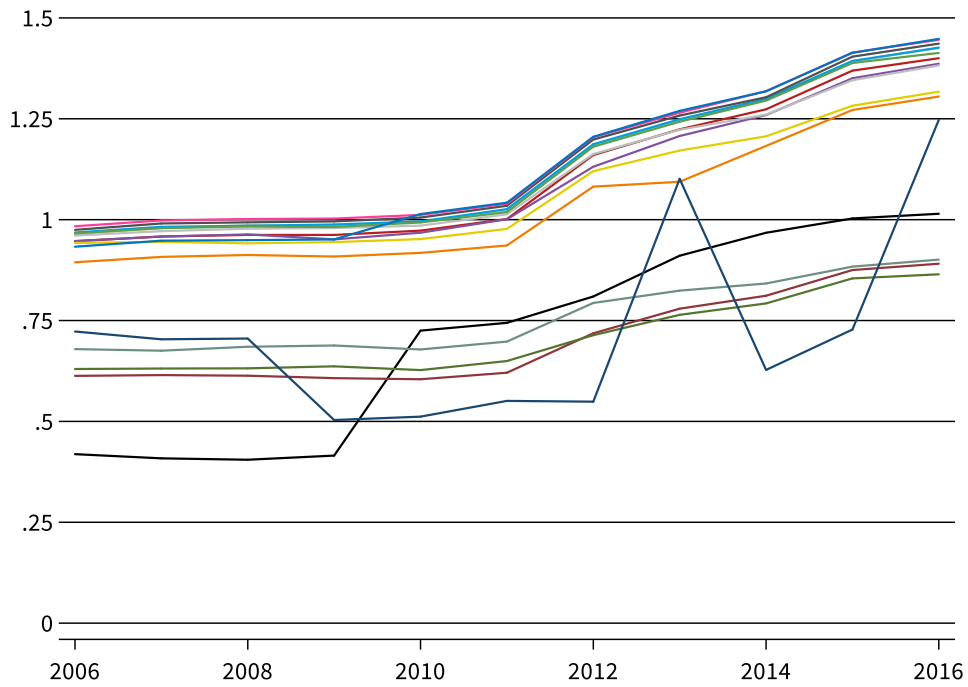
## Fiscal equalization as a driver of tax increases

Figure 7.3: Degree of fiscal redistribution (tax base  $\beta$ ), 2006–2016



Note: Degree of fiscal redistribution of changes in revenues due to tax base changes  $\beta_{i,t}$  for a state-specific shock in the tax base of the RETT (see Equation 3) obtained by own simulation analysis. The data points for 2006 and 2016 are reported in Table 7.1.

Figure 7.4: Degree of fiscal redistribution (tax base  $\beta$ ), counterfactual simulations, 2006–2016



Note: Degree of fiscal redistribution of changes in revenues due to tax base changes for a state-specific shock in the tax base of the RETT (see Equation 3) obtained by own simulations computed under the counterfactual assumption that tax rate and share of the tax base of the state under consideration have stayed constant at pre-reform levels.



## Fiscal equalization as a driver of tax increases

**Table 7.2: Descriptive statistics**

	Obs.	Mean	Std.	Min	Max
Tax rate	176	4.247	0.890	3.5	6.5
Degree of fiscal redistribution (tax base $\beta$ )	176	0.845	0.180	0.405	1.398
Counterfactual simulation	176	0.993	0.250	0.405	1.448
Degree of fiscal redistribution (tax rate $\rho$ )	176	-0.001	0.015	-0.025	0.043
Counterfactual simulation	176	-0.001	0.013	-0.021	0.026
Relative fiscal capacity	176	94.07	13.12	67.13	124.3
Relative fiscal capacity (excl. VAT)	176	1.384	0.532	0.499	2.955
Population size (in mill.)	176	5.100	4.691	0.655	18.03
Public debt (in 1,000 per capita)	176	9.607	6.614	1.587	35.34

Note: Tax rate of the real-estate transfer tax across the 16 German states in percent. Tax rates obtained from state announcements. Degree of fiscal redistribution  $\beta$  for a state-specific shock in the tax base of the RETT (see Equation 3) obtained by own simulation analysis. Degree of fiscal redistribution  $\rho$  for a state-specific shock in the tax rate of the RETT (see Equation 4) obtained by own simulation analysis. Relative fiscal capacity defined as fiscal capacity (*Finanzkraftmesszahl*) relative to fiscal need (*Ausgleichsmesszahl*) in percent. Debt of the states in per-capita terms in 1,000 euro obtained from the federal statistical office.

Table 7.3: OLS regression results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Degree of fiscal redistribution (tax base $\beta$ )	1.208*** (0.363)	1.211*** (0.364)	1.268*** (0.429)	1.298** (0.444)	1.207*** (0.376)	1.264** (0.453)	1.413*** (0.444)	0.935* (0.455)
Relative fiscal capacity		-0.002 (0.019)	0.245 (0.149)	-0.997 (0.662)	-0.003 (0.023)	0.242 (0.168)	-1.110 (1.013)	-1.003 (1.068)
Relative fiscal capacity (sq.)			-0.001* (0.001)	0.011 (0.007)		-0.001 (0.001)	0.013 (0.010)	0.012 (0.010)
Relative fiscal capacity (cub.)				-0.000* (0.000)			-0.000 (0.000)	-0.000 (0.000)
Relative fiscal capacity (excl. VAT)					0.049 (0.411)	0.073 (1.143)	-1.018 (1.528)	-1.447 (1.557)
Relative fiscal capacity (excl. VAT) (sq.)						-0.004 (0.157)	0.990* (0.514)	1.212* (0.571)
Relative fiscal capacity (excl. VAT) (cub.)							-0.211** (0.095)	-0.258** (0.108)
Tax rate								-0.145** (0.067)
Observations	176	176	176	176	176	176	176	176
R-squared (overall)	0.233	0.233	0.250	0.262	0.233	0.251	0.274	0.286

Dependent variable: difference in tax rate of the RETT in percent between next and current year. OLS regressions. All specifications include state- and year-fixed effects. Robust standard errors clustered by state in all specifications in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 7.4: IV regression results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Degree of fiscal redistribution (tax base $\beta$ )	0.897*** (0.333)	0.901*** (0.333)	1.040*** (0.354)	1.086*** (0.392)	0.941*** (0.292)	1.075*** (0.309)	1.305*** (0.385)	1.308*** (0.409)
Relative fiscal capacity		-0.001 (0.019)	0.236* (0.133)	-0.970 (0.657)	-0.003 (0.021)	0.238 (0.161)	-1.105 (1.009)	-1.052 (1.048)
Relative fiscal capacity (sq.)			-0.001* (0.001)	0.011* (0.007)		-0.001* (0.001)	0.013 (0.010)	0.012 (0.010)
Relative fiscal capacity (cub.)				-0.000* (0.000)			-0.000 (0.000)	-0.000 (0.000)
Relative fiscal capacity (excl. VAT)					0.105 (0.367)	0.065 (1.136)	-0.914 (1.667)	-1.468 (1.538)
Relative fiscal capacity (excl. VAT) (sq.)						0.004 (0.156)	0.924 (0.667)	1.245** (0.573)
Relative fiscal capacity (excl. VAT) (cub.)							-0.197 (0.129)	-0.265** (0.109)
Tax rate								-0.090 (0.105)
Observations	176	176	176	176	176	176	176	176
F-statistic (1st stage, excl. instr. $\beta$ )	22.17	19.72	16.63	16.44	86.95	76.56	53.04	50.48

Dependent variable: difference of tax rate of the RETT in percent between next and current period. Instrumental variable estimation results based on a counterfactual measure of redistribution obtained under the assumption of unchanged tax policies (see text). All specifications include state- and year-fixed effects. Robust standard errors clustered by state in all specifications in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 7.5: IV regression results including the equalization rate effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Degree of fiscal redistribution (tax base $\beta$ )	0.962** (0.422)	0.989** (0.489)	1.110** (0.533)	1.116** (0.524)	1.001** (0.414)	1.126** (0.452)	1.389** (0.594)	1.350** (0.634)
Degree of fiscal redistribution (tax rate $\rho$ )	2.637 (4.564)	3.161 (6.544)	2.284 (6.373)	0.986 (5.673)	3.107 (6.935)	2.215 (6.922)	3.243 (7.193)	1.621 (9.190)
Relative fiscal capacity		-0.004 (0.024)	0.244* (0.131)	-0.974 (0.657)	-0.005 (0.024)	0.249* (0.151)	-1.054 (1.053)	-1.033 (1.084)
Relative fiscal capacity (sq.)			-0.001** (0.001)	0.011* (0.007)		-0.001* (0.001)	0.012 (0.010)	0.012 (0.011)
Relative fiscal capacity (cub.)				-0.000* (0.000)			-0.000 (0.000)	-0.000 (0.000)
Relative fiscal capacity (excl. VAT)					0.037 (0.430)	-0.037 (1.132)	-1.216 (1.911)	-1.549 (1.684)
Relative fiscal capacity (excl. VAT) (sq.)						0.013 (0.149)	1.027 (0.788)	1.257** (0.596)
Relative fiscal capacity (excl. VAT) (cub.)							-0.214 (0.154)	-0.265** (0.111)
Tax rate								-0.079 (0.145)
Observations	176	176	176	176	176	176	176	176
F-statistic (1st stage, excl. instr. $\beta$ )	17.28	13.13	10.92	11.27	59.07	37.63	66.15	107.10
F-statistic (1st stage, excl. instr. $\rho$ )	24.06	27.33	41.12	34.18	30.95	46.83	36.11	35.63

Dependent variable: difference of tax rate of the RETT in percent between next and current period. Instrumental variable estimation results based on counterfactual measures of redistribution obtained under the assumption of unchanged tax policies (see text). All specifications include state- and year-fixed effects. Robust standard errors clustered by state in all specifications in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 7.6: IV regression results including state debt

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Degree of fiscal redistribution (tax base $\beta$ )	0.897*** (0.333)	0.893*** (0.321)	0.862** (0.339)	0.957*** (0.368)	0.928*** (0.285)	0.898*** (0.315)	1.130*** (0.356)	1.104*** (0.400)
Public debt (per capita)		0.001 (0.018)	0.024 (0.019)	0.017 (0.019)	0.002 (0.019)	0.031 (0.023)	0.027 (0.026)	0.032 (0.033)
Relative fiscal capacity		-0.001 (0.020)	0.310** (0.134)	-0.760 (0.660)	-0.003 (0.022)	0.295* (0.150)	-0.919 (1.042)	-0.813 (1.105)
Relative fiscal capacity (sq.)			-0.001** (0.001)	0.009 (0.007)		-0.001** (0.001)	0.011 (0.010)	0.010 (0.011)
Relative fiscal capacity (cub.)				-0.000 (0.000)			-0.000 (0.000)	-0.000 (0.000)
Relative fiscal capacity (excl. VAT)					0.117 (0.384)	0.714 (1.155)	-0.293 (1.675)	-0.969 (1.541)
Relative fiscal capacity (excl. VAT) (sq.)						-0.076 (0.155)	0.793 (0.632)	1.226** (0.572)
Relative fiscal capacity (excl. VAT) (cub.)							-0.183 (0.121)	-0.278** (0.112)
Tax rate								-0.128 (0.088)
Observations	176	176	176	176	176	176	176	176
F-statistic (1st stage, excl. instr. $\beta$ )	22.17	24.980	33.13	31.63	66.50	82.40	61.81	43.56

Dependent variable: difference of tax rate of the RETT in percent between next and current period. Instrumental variable estimation results based on a counterfactual measure of redistribution obtained under the assumption of unchanged tax policies (see text). All specifications include state- and year-fixed effects. Robust standard errors clustered by state in all specifications in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## 8 Conclusion

I have elaborated on selected incentives in fiscal federalism by using the example of the federal system in Germany. Many countries have decentralized governments aiming to improve the performance of the public sector. The allocation of tasks and public services to different levels requires however a well-designed institutional structure. The decentralization of public services and tasks is thus combined with an allocation of spending and financing responsibilities to ensure the autonomy of subnational governments. Federations also implement equalization schemes or provide intergovernmental grants to subnational governments to reduce disparities between subnational regions. The combination of autonomy and equalization may however provide incentives to reduce efforts in generating own revenues. The behavior of politicians may also influence economic policy-making. Public choice theories suggest that politicians are self-interested and maximize own welfare rather than social welfare.

My studies provide mixed evidence for political and fiscal incentives within Germany's federalism. Chapters 2 and 3 examined election cycles, based on the political business cycle theories. The political business cycle theories describe that politicians are likely to increase their reelection chances by pursuing expansionary policies before elections. In Chapter 2, I examined whether election cycles occur in fees of German municipalities. Fees are interesting to investigate as they are levied according to the benefit principle. Fees have to be equivalent to the (expected) costs of the public service they are levied on. This should constrain governments. My results show however that municipalities have a leeway to decide on fees and use this leeway to improve election prospects. Fees increase less in election years and increase more directly after elections than in the middle of the legislative period. The results of Chapter 3 show however that governments do not always use their discretionary power. In joint work with my co-authors, I analyzed salary increases of German state MPs, for which the states have the decision-making authority. The results do not show that electoral motives influence increases in MP salaries. Politicians can, by contrast, increase their salaries at any point in time.

In Chapters 4 and 5, I investigated how government ideology influences economic policy-making. Partisan theories describe that left-wing and right-wing governments pursue different policies in line with the preferences of their constituencies. The evidence of my studies is however mixed. In Chapter 4, which is based on joint work with my co-authors, I analyzed whether government ideology influences income inequality in the public sector of the German states. We used data on salaries of civil servants and calculated several income inequality measures. The results do not show that left-wing governments were more active in decreasing income inequality in the public sector than center or right-wing governments. The results of Chapter 5, by contrast, show that left-wing and right-wing governments may well differ in their policies. In joint work with my co-author, I analyzed whether government ideology predicts tax policies of the German states. A reform of the fiscal constitution in 2006 allowed the states to

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set the tax rates of the real-estate transfer tax. By investigating the tax rate increases of the German states from 2007 onwards, our results show that left-wing governments were more active in increasing the tax rates than right-wing governments.

Chapters 6 and 7 investigate fiscal incentives within the federal system in Germany. In joint work with my co-author, I analyzed whether the institutional setting in Germany also provides incentives for states' tax policies. The German fiscal equalization scheme redistributes revenues among the federal and state level and between states equalizing funds for the states. The devolution of tax setting powers to the states in 2006 provides an interesting set-up to investigate the combination of tax autonomy and fiscal equalization. The descriptive results in Chapter 6 and the empirical analysis in Chapter 7 show that equalization substantially influences tax policies of the states. The redistribution of revenues within the equalization scheme provides incentives for the states to raise rather than to lower their tax rates.

The results of my thesis show that political and fiscal incentives may well influence economic policy-making. Electoral motives and government ideology can explain parts of individual economic policies. Citizens should thus be aware of the given leeway of politicians in several policy fields. The mixed evidence on political incentives however also shows that politicians are not always prone to manipulate economic policy-making. Important to note is also that the interpretation of results depends crucially on how the empirical analyses were conducted. I only rely on correlations when examining partisan effects. Government ideology variables are likely to be endogenous. One concern is reverse causality. Omitted variable bias concerns play however also a role. It was not possible to identify causal effects when analyzing partisan effects because of too small samples. Possible policy implications from analyses of partisan effects have to take this shortcoming into account. Future research thus needs to find a way to overcome the endogeneity problem of government ideology variables to identify causal effects of partisanship – also when samples are small.

I also show that the institutional set-up in federal systems may provide incentives for governments. Chapters 6 and 7 show that the combination of tax autonomy and fiscal equalization distort tax policies in the German states. This result is relevant for policymakers and also for the public debate. A well-designed institutional setting has to rule out distortive incentives. In Chapter 6, we propose a solution to overcome the distortive incentive effect of fiscal equalization on tax policy. This recommendation could serve as a starting point for policymakers to reform fiscal equalization in Germany in the near future.

Many countries implemented federal systems aiming to improve the performance of the public sector. Every federal system needs however also a well-designed institutional structure to limit distortive incentives. Decentralized governments can improve welfare. Important is that they improve social welfare and not politicians' welfare. As the philosopher and political theorist Edmund Burke stated:

*“Government is a contrivance of human wisdom to provide for human wants.  
Men have a right that these wants should be provided for by this wisdom.”*



## Conclusion

## Curriculum Vitae

### **Manuela Maria Krause**

born on June 19, 1989 in Wickede (Ruhr), Germany

since 02/2015	Ph.D. Candidate, Munich Graduate School of Economics, Ludwig-Maximilians-Universität, Munich
	Junior Economist and Doctoral Student, Ifo Institute – Leibniz Institute for Economic Research at the University of Munich
10/2011 – 09/2014	Master of Science in Economics, University Bielefeld
10/2008 – 09/2011	Bachelor of Science in Economics, University Bielefeld
06/2008	Abitur (High School Diploma), Walburgisgymnasium Menden (Sauerland)

