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**Conference Paper**

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Beiträge zur Jahrestagung des Vereins für Socialpolitik 2014: Evidenzbasierte Wirtschaftspolitik  
- Session: Collective Decision Making II, No. B06-V3

**Provided in Cooperation with:**

Verein für Socialpolitik / German Economic Association

*Suggested Citation:* Hessami, Zohal (2014) : Electoral Rules for Mayors and Incentives to Pork-Barrel: Quasi-Experimental Evidence from German Municipalities, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2014: Evidenzbasierte Wirtschaftspolitik - Session: Collective Decision Making II, No. B06-V3, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und Hamburg

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# Electoral Rules for Mayors and Incentives to Pork-Barrel: Quasi-Experimental Evidence from German Municipalities

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## Abstract

This paper exploits a natural experiment in Hesse where a reform of the electoral rule from mayor appointment by the local council towards direct mayor elections was introduced during a phase-in period from 1993 to 1998. The end of the term of the last appointed mayor varies across municipalities for exogenous historical reasons and determines the timing of the switch in a particular municipality. Difference-in-difference estimations for 421 municipalities over the period from 1981 to 2010 reveal that municipalities with a directly elected mayor attract 5% more investment transfers from the state tier. This effect only materializes in the election year which suggests that mayors under the new electoral rule put more effort into grant applications for highly visible infrastructure projects in order to increase their re-election probability.

**Keywords:** Pork-barrel politics, electoral rule, local government, electoral cycle  
**JEL codes:** D72, H72, H77

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# 1 Introduction

Politicians that desire to be re-elected have an incentive to compete for funds whose allocation is endogenous to their lobbying effort. This so-called *pork barrel activity* is mostly discussed in the existing literature with regard to legislators at the state level who attempt to channel resources to their home districts. A seminal contribution on this subject is provided by Stratmann and Baur (2002) who investigate how the electoral rule for legislators (first-past-the-post versus proportional representation) affects incentives to pork-barrel. In line with their hypothesis, the authors find that legislators elected by a geographically concentrated constituency are more involved in pork-barrel politics. This result has recently been confirmed in the context of the Italian House of Representatives (Gagliarducci, Nannicini, and Naticchioni, 2011) and historical data for Switzerland (Funk and Gathmann, 2013).

The above contributions show that the institutional environment and in particular the electoral rule matters for pork-barrel activity. Yet, the focus is solely on the legislature and on the state level. A first contribution of this paper is to shift the focus on local governments and to look at incentives to pork-barrel faced by local executives, i.e. mayors, and to investigate how this incentive varies with the electoral rule for mayors.

There are two ways to choose a mayor. In the *council-manager system*, the local council appoints the mayor which makes the re-election chances of the incumbent mayor mainly dependent on the support of the council majority. In the *mayor-council system*, voters directly elect the mayor. Except that the second system may reduce voters' disenchantment with politics, it is not clear whether it matters which of the two electoral rules is applied.

One difference between the two electoral rules may arise from electoral incentives. The general idea behind electoral incentives is that elections may motivate politicians to act in the interest of voters via the threat of not being re-elected. In reality, this may lead for example to higher spending prior to an election which may only be in the interest of voters

in the short run. A reasonable conjecture is that in the mayor-council system, incentives to exert effort in a way that is visible to voters are larger than in the council-manager system because the incumbent needs the support of the electorate at large rather than only the (typically guaranteed) support of her party to be re-elected.

This paper tests the hypothesis of larger electoral incentives for directly elected mayors with a dataset covering 421 municipalities in the German state of Hesse over the 1981-2010 period. Hesse provides a compelling setting to study the link between the mayoral election system and transfer allocation for two reasons. First, Hesse has a transfer system that allocates project-specific investment grants only when the mayor or the local council of a municipality submits an application package to the responsible state ministry. This package typically includes a description of the project and its costs as well as a detailed exposition to what extent the project complies with the respective funding guidelines. As long as these requirements are fulfilled and the state has enough resources at its disposal, the grant is approved. This provides a setting where effort is decisive for being awarded a grant. Therefore, investment grants per capita are used as the dependent variable in the empirical analysis.

Second, Hesse switched from the council-manager to the mayor-council system during a phase-in period that lasted from 1993 to 1998. The municipality-specific timing of the switch was determined by the end of the term of the last appointed mayor. The variation in the timing is therefore arguably exogenous. For a limited period, both municipalities with appointed and elected mayors coexisted in Hesse for reasons unrelated to determinants of the state government's transfer policy. This set-up allows me to identify a causal effect.

The above two features of the setting in Hesse allow for the main contribution that this paper makes: a straightforward test for larger electoral incentives with direct mayor elections.<sup>1</sup> Existing studies are fraught with specific shortcomings and arrive at contradicting

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<sup>1</sup>Another strand of the literature on electoral incentives uses term limits to identify causal effects. A seminal contribution is Besley and Case (1995) who provide evidence for increasing state taxes and expenditures

conclusions. The outcome variables – usually local expenditures or tax rates – provide at best a vague indication of the effect of electoral rules on electoral incentives.

Blume, Doering, and Voigt (2008) find that a switch to direct elections of mayors has led to lower expenditures and revenues in the German state Schleswig-Holstein compared to Baden-Wuerttemberg where direct elections were used all along. However, the analysis suffers from the fact that expenditures are aggregated at the state-level making it impossible to disentangle the observed effects from state-specific effects. Smart, Köthenbürger, and Egger (2011) focus on the introduction of direct mayor elections in Lower Saxony which was accompanied by a large shift in the balance of power towards the mayor and away from the local council. The authors find that local spending increases with direct mayor elections, in particular redistributive spending. Unfortunately, this setting does not allow the authors to distinguish whether the effect on spending levels can be attributed to electoral incentives or to the increased power of the mayor which give the mayor more room for maneuver. Finally, Ade (2013) analyzes a switch of mayor appointment by the local council to direct mayor elections in three German states and provides evidence that contradicts Smart, Köthenbürger, and Egger (2011): tax rates are lower and public spending is higher with directly elected mayors.<sup>2</sup> Finally, Coate and Knight (2011) provide an alternative theory of fiscal policy determination under the two regimes and find in a panel analysis for US municipalities that spending is lower in mayor council cities.

This paper also makes an important contribution to the literature on the political economy of intergovernmental transfers by emphasizing electoral incentives of officeholders in the

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when governors cannot run for re-election due to a term limit. List and Sturm (2006) confirm these findings at a more disaggregated level: environmental regulation diverges more strongly from voters' preferences when a term limit strikes. Recently, Aidt and Shvets (2012) show how the incentives of US state legislators to bring home pork-barrel spending to their districts diminishes when a term limit applies. Finally, Ferraz and Finan (2011) show that term limits may give rise to an increase in corruption, while de Janvry, Finan, and Sadoulet (2012) show that the quality of public policies at the local is higher for mayors that face reelection.

<sup>2</sup>For the case of Indonesia, Kis-Katos and Sjahrir (2013) do not find any effect of direct mayor elections on public spending.

receiving municipalities – rather than electoral considerations of the paying state government – as a key determinant of transfer allocation.<sup>3</sup> A main finding of the existing literature (Arlampalam, Dasgupta, Dhillon, and Dutta, 2009; Solé-Ollé and Sorribas-Navarro, 2008) is that there is partisan alignment in the allocation of discretionary transfers that maximizes the state governments’ chances for re-election.<sup>4</sup> In particular, ideologically aligned mayors that won their last election by a close margin receive more resources prior to the next mayor election so that they manage to stay in office and can provide local support for the state government’s electoral campaign (Brollo and Nannicini, 2012). While this provides a reasonable explanation for the allocation of transfers where the state government alone has an influence, it may not apply to transfer programs that necessitate an application to be sent to the state tier by individual municipalities.<sup>5</sup>

The baseline estimation results suggest that municipalities with the mayor-council system indeed receive more investment transfers. After establishing the causal effect of the electoral rule on discretionary transfers, I explore possible transmission channels. As detailed above, my preferred explanation for the positive effect of a mayor-council system on higher transfer receipts is that directly elected mayors exert more effort. This is partially confirmed by the fact that this effect is only visible in election years. Future investigations will explore other potential transmission channels.

The remainder of this paper proceeds as follows: section 2 describes the institutional setting in Hesse. Section 3 provides a first impression of the data. Section 4 describes the

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<sup>3</sup>Another important determinant is the availability of referenda as shown by Feld and Schaltegger (2005).

<sup>4</sup>More recently, Baskaran (2013b) analyzes this question in the specific context of Hesse where the state government pays discretionary bailout transfers to municipalities. He does not find any significant evidence that the vote share of the ruling state government party is higher in municipalities that receive bailouts. He concludes that electoral concerns of the state government do not determine the allocation of transfers.

<sup>5</sup>One may also relate my paper to the literature on common pool problems (Baskaran, 2013a; Pettersson-Lidbom, 2012; Schaltegger and Feld, 2009) or the literature on political budget cycles that are conditional on institutional features at the level of sub-national governments (Aidt and Mooney, 2013; Aidt, Veiga, and Veiga, 2011; Akhmedov and Zhuravskaya, 2004; Sjahrir, Kis-Katos, and Schulze, 2013).

empirical strategy and the baseline estimation results. Section 5 a number of extensions to the empirical analysis that will be investigated in the future. Section 6 concludes.

## 2 Institutional details

### 2.1 The German state of Hesse

Hesse is among the more prosperous states in the German Federation. In its history, this state has been ruled both by left-wing and right-wing governments. The population size of Hesse was 6.1 million at the end of 2012 which is about 7.6% of the total German population. There are 426 municipalities in Hesse of which five have a special status as they are particularly large municipalities. For this reason, these five municipalities assume both municipal and county responsibilities.<sup>6</sup> The other 421 municipalities are organized into 21 counties.

Municipalities provide their citizens with a number of goods and services whose provision is either voluntary or compulsory. Compulsory provision includes primary schooling, municipal daycare services, and civil protection, while municipalities sometimes voluntarily provide swimming pools, sports venues, and hospitals.

Public provision of goods and services at the municipal level in Hesse is financed with municipal taxes, user fees, and transfers. In 2010, the 421 ordinary municipalities overall had 16.5 billion Euros at their disposal. General expenditures are financed through taxes and transfers, while user fees are charged for specific services. Out of a number of municipal taxes, two are economically relevant: the property tax and the business tax. Each municipality is free to set the multiplier for these taxes independently. This implies that municipalities are free to expand the provision of public goods and the associated expenditures.

In addition to own-source tax revenues, municipalities in all German states receive revenues from taxes that are shared with the state and federal tier. As a result, municipalities

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<sup>6</sup>These five municipalities are Darmstadt, Frankfurt, Kassel, Offenbach, and Wiesbaden.

in Hesse receive a fraction of the income tax and the value-added tax revenues that are collected within the boundaries of a given municipality. The rates for these two taxes are, however, not set by the municipality and they are homogeneous across the entire federation.

## **2.2 Intergovernmental transfers in Hesse**

An important source of income for municipalities are transfers provided by the state tier. The rationale behind these payments is the constitutional requirement that inhabitants of Hesse should have about the same living standard irrespective of the municipality that they live in. Therefore, the state government has to provide poorer municipalities and/or municipalities that face a higher burden of public provision of goods and services with the necessary financial means.

### **2.2.1 Financing of state-level grants to Hessian municipalities**

The first step in the municipal equalization scheme is the determination of the total amount of resources to be allocated among all Hessian municipalities. This amount varies over the years and depends directly on the amount of revenues that the state government collects. In particular, this amount equals 23% of the state government's total revenues from the income tax, the corporate tax, the sales tax, the wealth tax, the motor vehicle tax, the property acquisition tax, and the apportionment of the business tax plus additional resources that the state government may wish to add. In 2013, the resources available for the municipal equalization scheme amounted to 3.8 billion Euros which were allocated via general purpose grants, special purpose grants, and investment grants.

### **2.2.2 General purpose grants to Hessian municipalities**

More than half of the available funds in Hesse are allocated to municipalities via general purpose grants (*Schlüsselzuweisungen*). The allocation of the grants follows specific rules



that take into account the fiscal need and the fiscal capacity of each municipality. The fiscal capacity measure reflects the hypothetical tax-raising potential of a municipality, while the fiscal need measure is a function of a municipality's population size.

When fiscal need exceeds fiscal capacity of a specific municipality, a certain fraction of this difference is compensated via a grant that is allocated to this municipality. Any shortfall of fiscal capacity below 80% of the fiscal need measure is completely equalized. When fiscal capacity exceeds fiscal need, a municipality nevertheless receives a minimum amount of general purpose grants. This minimum is a function of population size. More details on the rules that determine the allocation of general purpose grants in Hesse are provided by Baskaran (2013c).

### **2.2.3 Special purpose grants to Hessian municipalities**

Special purpose grants are tied to a particular purpose on which the municipality has to spend the grants received. In Hesse, a number of special purpose grants exist that cover the following areas: schooling, day-care facilities, nursery schooling, youth welfare services, social welfare, public transport, theaters, museums, libraries, music schools, culture, road construction as well as health resorts.

The allocation of most types of special purpose grants follows a formula that is described in detail in the fiscal equalization law of Hesse. For schooling transfers, the number of enrolled students is decisive for the amount that a municipality receives, while the transfers provided for road construction are a positive function of the kilometers of roads that already exist within a municipality's boundaries. On the other hand, the allocation of transfers tied to public transport, theaters, libraries, museums, and music schools does not follow a rule.

#### 2.2.4 Investment grants to Hessian municipalities

Investment grants that are transferred from the Hessian state government to individual municipalities consist of a lump-sum grant and a project-specific grant that is allocated to a municipality to (co-)finance a specific project. In 2013, the total lump-sum payments amounted to 175 million Euros, while the total project-specific payments amounted to 189 million Euros in Hesse.

The lump-sum grant consists of one part that can be used for any purpose (*allgemeine Pauschale*) and a second part that is intended for school buildings (*Schulbaupauschale*). The lump-sum investment grant that a municipality receives for general purposes is vaguely dependent on the fiscal capacity of a municipality, while the second part of the lump-sum investment grant depends on the number of students that are enrolled in a municipality.

More than half of the investment grants that Hessian municipalities receive is project-specific (*projektbezogene Investitionszuweisungen*) and is used for projects that fall into one of the following fifteen areas: financing of hospitals, municipal drinking water system, municipal (hazardous) waste disposal, public transport, municipal road construction, municipal child-care facilities, municipal elderly care facilities, habitat protection, municipal energy-saving measures, business-related municipal infrastructure, village and city renewal, water protection, libraries, museums, music schools, sports facilities, and municipal facilities for the disabled. Project-specific grants cover a certain share of the overall cost that this project would create.

In order to receive such a grant a written application by the mayor or the local council is required. The reform of the electoral rule for mayors in Hesse has not affected this procedure in any way. Depending on the type of the project, the application has to be sent to one of the ministries. For instance, the Ministry of Social Affairs is responsible when there is a project that has to do with elderly care or hospitals, while the Ministry of Economic Affairs, Traffic, and Land Renewal is responsible for projects that concern public transport or village

renewal. The application package contains a detailed description of the project as well as an argumentation to what extent project complies with the funding guidelines that concern for instance energy-saving standards. It is in the end the responsible ministry that decides whether a project grant is approved. Generally, as long as the funding guidelines are fulfilled and there are enough resources available, municipalities are awarded the grant.

### **2.3 The switch to direct mayor elections**

On 20 January 1991, a referendum on the introduction of direct mayor elections was held in the German state of Hesse which was supported by 83% of voters. As a result, the relevant laws were changed in May 1992 and during a phase-in period that lasted from 1993 to 1998, Hessian municipalities switched from a council-manager system to a mayor-council system.

What makes Hesse a compelling setting to study the effects in the nomination scheme of the mayor is that the responsibilities of the mayor did not change through this reform. Hence, when observing policy and fiscal outcomes of a municipality before and after the reform changes can be attributed to a change in the electoral rule rather than a change in the power or the responsibilities of the mayor.

There are a number of features of the political system in Hessian municipalities that were not affected by the reform. The municipal code (*Gemeindeordnung*) of Hesse – the magistrate constitution – stipulates that the local council is in charge of key decisions and monitors the overall administration. The council can hand over some decisions to the magistrate. The council is headed by an elected chairman who presides over council meetings. The council is elected from party lists under a single-district proportional election rule. Council elections take place at a uniform date across the entire state. Before 2001, they have taken place every four years and since 2001 they have taken place every five years. The magistrate usually consists of two members and the mayor (who is either appointed or directly elected) and is present at the council's meetings and is entitled to voice its opinion. The size of the

magistrate is determined by the municipality itself and especially in large cities there may be more than three magistrate members.

Regardless of the electoral rule, the mayor of a Hessian municipality works usually full-time, whereas the other members of the magistrate often work in an honorary capacity. This gives the mayor an important advantage. In addition, the mayor can delegate some of his tasks to the other members of the magistrate which gives him even more freedom to focus on the more important tasks.

There are, however, a few things that have changed with the reform of the electoral rule. Before the reform the mayor was appointed by the local council with a 2/3 majority. The council was able to remove all magistrate members from office if it wished to do so. This also included the appointed mayor. Since the reform, the mayor is elected by the people. If no candidate receives an absolute majority of votes, a run-off election takes place where the two most successful candidates of the first-round run against each other. Overall, it can be stated that the reform has removed the dependence of the mayor on the local council. This independence, however, also comes at a cost for the incumbent mayor. When running for re-election the incumbent mayor cannot rely anymore on the entrenched majority of his party in the local council.

### **3 Descriptive statistics**

In this section, we will have a closer look at the data which has been provided by the Statistical Office of Hesse. One objective is to investigate to what extent the institutional setting that is exploited in this paper represents a true natural experiment. A second objective is to see whether the data exhibits certain patterns that need to be taken into account in the specification of the empirical model. Finally, I provide preliminary descriptive evidence on

the effect of the electoral rule reform on the allocation of intergovernmental grants to Hessian municipalities.

### 3.1 Timing of first direct mayor elections

The first direct mayor elections in Hesse took place on 02 May 1993. On this particular day, six municipalities elected a mayor into office by popular vote: Alsfeld, Borcken, Gudensberg, Lauterbach, Ottrau, and Waldems. On the other hand, the last date where a Hessian municipality held its first direct mayor election was on 08 November 1998 in Melsungen. This means that the phase-in period for the new electoral rule stretches over a little more than 5.5 years defining six cohorts: 1993, 1994, 1995, 1996, 1997, and 1998.

Table 1 summarizes how the 421 first direct mayor elections are spread out between 1993 and 1998. The fact that the elections are spread out quite evenly over these six years supports the fact that we are facing a natural experiment. One exception are the last two years where only about half as many municipalities applied the direct election rule for the first time. A reasonable explanation is the fact that the pool of non-switched municipalities has become smaller reducing the likelihood of switching in the last two years. Alternatively, it might be that some municipalities chose to reschedule their first direct mayor election to an earlier date.<sup>7</sup> As soon I have collected additional data on the dates of the mayor appointments, I will investigate this in more detail. In particular, I will check whether there is an uneven distribution across individual years in the likelihood of serving less than six years among the last cohort of appointed mayors.

There is variation in the timing of the first direct mayor election for exogenous historical reasons. According to the Hessian municipal code, the (appointment or direct election) of a

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<sup>7</sup>It should be noted that this explanation is quite unlikely to be valid. It is not allowed by constitution to deviate from the duration of the six-year terms. In addition, it would not be in the interest of an incumbent to shorten his term since the eligibility for pension payments of mayors are highly dependent on the number of years in office.

**Table 1:** TIMING OF THE INTRODUCTION OF DIRECT MAYOR ELECTIONS IN HESSE

Year	Municipalities	Mayors appointed by local council		Directly elected mayors	
		Number	Share	Number	Share
1992	421	421	100%	0	0%
1993	421	338	80.3%	83	19.7%
1994	421	253	60.1%	168	39.9%
1995	421	175	41.6%	246	58.4%
1996	421	90	21.4%	331	78.6%
1997	421	46	10.9%	375	89.1%
1998	421	0	0%	421	100%

mayor has to take place three to six months before the incumbent steps down. Since several decades have passed since the state of Hesse was founded after World War I, some of the variation arises due to the autonomy that municipalities have in choosing their election date. A second important reason for the variation in the mayor election dates is that it is not rare that mayors do not serve a full term. The usual reasons are death, sickness, retirement or dismissal by the council. These incidences are largely exogenous.<sup>8</sup>

### 3.2 Pre-determined characteristics of municipalities

An indirect test of the exogeneity in the timing of the first direct mayor election investigates whether the pre-determined characteristics of municipalities differ depending on whether the reform of the electoral rule was first applied in 1993, 1994, 1995, 1996, 1997 or 1998. Hence, for each characteristic we calculate averages for the years before 1993 and then we conduct two-group mean-comparison t-tests for each possible pair that can be constructed from the six municipality cohorts.

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<sup>8</sup>To give an example, the first mayor of the Hessian municipality of Hanau (Karl Rehbein) was appointed twice by the local council but died after ten years in office, i.e. two years ahead of the end of his second term. The second mayor (Heinrich Fischer) served a full term of six years. The third mayor of Hanau (Herbert Dröse) was elected twice into office but retired in the middle of his second term. The fourth mayor of Hanau (Hans Martin) served two full terms. Helmut Kuhn was only in office for about 16 months as he was dismissed by the local council. Finally, Hans Martin was elected again into office two times before retiring three years ahead of the end of his last term.

**Table 2:** MEAN-COMPARISON T-TESTS, 1991-92 AVERAGES OF MUNICIPALITY CHARACTERISTICS

Reform cohorts	Share of population > 65 years						Share of population 15-65 years					
	1993	1994	1995	1996	1997	1998	1993	1994	1995	1996	1997	1998
1993	0						0					
1994	-0.329	0					0.294	0				
1995	-0.143	0.185	0				0.173	-0.121	0			
1996	-0.113	0.216	0.031	0			0.280	-0.014	0.107	0		
1997	-0.618*	-0.289	-0.475	-0.505	0		0.199	-0.096	0.025	-0.082	0	
1998	-0.014	0.315	0.129	0.099	0.604*	0	-0.264	-0.558*	-0.437	-0.544*	-0.462	0
Reform cohorts	Total population size						Property tax rate B multiplier					
	1993	1994	1995	1996	1997	1998	1993	1994	1995	1996	1997	1998
1993	0						0					
1994	1.931	0					-0.002	0				
1995	0.754	-1.177	0				5.262	5.264	0			
1996	3.297***	1.366	2.544***	0			7.527*	7.529*	2.265	0		
1997	-0.995	-2.925*	-1.748	-4.292***	0		-0.772	-0.770	-6.034	-8.299	0	
1998	0.087	-1.844	-0.666	-3.210***	1.082	0	-0.297	-0.295	-5.559	-7.824	0.475	0

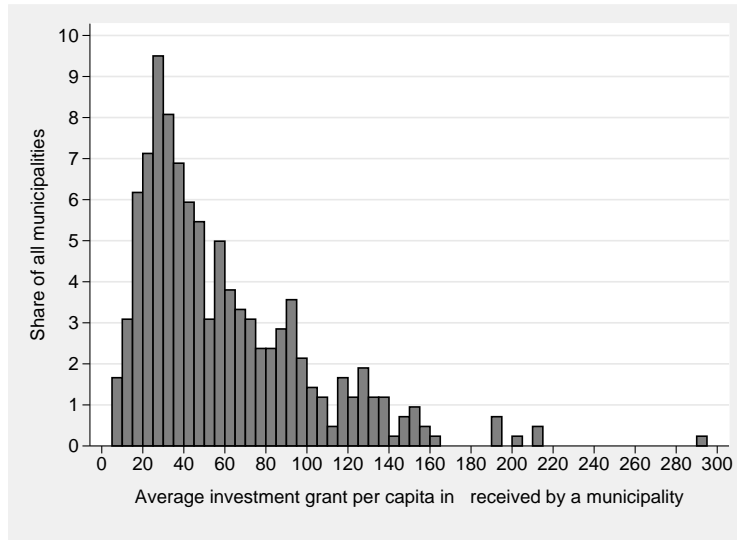
<sup>a</sup> This table presents results mean-group comparison t-tests.

<sup>b</sup> Stars indicate significance levels at 10% (\*), 5% (\*\*) and 1%(\*\*\*)

Table 2 summarizes the results for all the pairwise t-tests for six characteristics of Hessian municipalities that relate to tax policy choices and demographic characteristics. While there are a few significant differences to be observed across the reform cohorts concerning the total population size, there are hardly any differences in the distribution of the population across age groups or the multiplier for property tax rate B. We conclude that the significant differences are coincidental and not indicative of an endogenous timing of the first direct mayor election.

### 3.3 Level and distribution of investment grants per capita

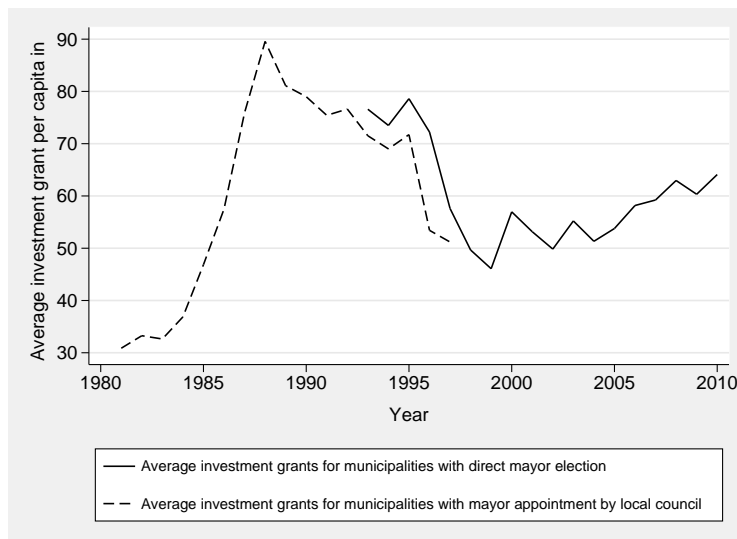
Figure 1 presents a histograms for the cross-sectional distribution of investment grants per capita averaged over the time period from 1981 to 2010. The histogram illustrates a right-skewed distribution in investment grants. Most of the municipalities receive on average an investment grant that amounts to less than 100 euros per capita. Particularly notable are the outliers with per capita grants of up to almost 300 euros.



**Figure 1: DISTRIBUTION OF INVESTMENT GRANTS PER CAPITA**

### 3.4 Graphical evidence

Given that we have a natural experiment, we should be able to observe differences in average investment grants across municipalities with the two types of mayor electoral rule even without controlling for any other variables. To see whether there is an effect of the electoral rule on investment grants, figure 2 provides us with a first impression.



**Figure 2: AVERAGE INVESTMENT GRANTS AND THE ELECTORAL RULE FOR MAYORS IN HESSE, 1981-2010**



In general, there is quite a lot of variation over time in the average investment grant per capita paid to Hessian municipalities. One reason is probably – as pointed out in section 3.2.1 – that the amount of resources available for rule-based or discretionary grants depends on the tax revenues that the state government collects in a particular year. We see a marked increase in investment grants from the early 1980s to the late 1980s followed by a downward movement until the end of the 1990s which is then followed by an upward trend until 2010.

What is more important is the difference between the dashed line (average grants to municipalities in the old system) and the solid line (average grants to municipalities in the new system). Independent of the trend during the phase-in period of the new electoral rule from 1993 to 1998, the solid line is always above the dashed line, i.e. municipalities with directly elected mayors receive larger investment grants. Given that the composition of the two groups changes over time as municipalities gradually switch to the new system, this consistent patterns speaks to the fact that there is indeed no endogeneity in the timing of the switch for an individual municipality in Hesse.

## 4 Empirical analysis

### 4.1 Empirical strategy

The estimations are conducted based on the difference-in-difference methodology. The effect of the reform of the electoral rule which has both a time and a cross-sectional dimension – i.e. those municipalities that are treated and after they were treated – is captured by means of a dummy variable (*DMER*) that is 1 for a municipality as of the year where it has held its first direct mayor election and 0 otherwise. The dependent variable is the normally distributed log of investment grants per capita in order to fulfil the standard assumptions for the validity of hypothesis testing.

In addition, the estimations include interaction terms that further investigate the pattern of the effect that the electoral rule has on the allocation of investment transfers. If the underlying mechanism indeed relates to electoral incentives of mayors and the effort that they exert to attract grants, this effect should only or mostly be visible in the election year or just before. In the estimations, we consider the election year itself as well as one or two years before and after the direct mayor election.

The regression model can be summarized as follows:

$$\begin{aligned} \text{Log}(\text{INVpc}_{it}) = & \alpha_i + \mu_t + \beta \text{DMER}_{it} + \gamma \text{DMER}_{it} * \text{Electionyr}_{it} \\ & + \delta \text{DMER}_{it} * \text{Electionyr-1}_{it} + \phi \text{DMER}_{it} * \text{Electionyr-2}_{it} \\ & + \delta \text{DMER}_{it} * \text{Electionyr+1}_{it} + \phi \text{DMER}_{it} * \text{Electionyr+2}_{it} + \epsilon_{it}, \end{aligned}$$

where INVpc represent investment transfers per capita in Euros. The estimations include municipality fixed effects  $\alpha_i$  and time fixed effects  $\mu_t$ . All hypothesis tests make use of heteroscedasticity-robust standard errors. Given that Bertrand, Duflo, and Mullainathan (2004) show that autocorrelation is a substantial concern in difference in difference frameworks, the standard errors are clustered at the level of the 421 municipalities.

The most complete model controls for demographic variables (population size, the share of between 6-15 year olds, the share of 15-65 year olds, and the share of over-65 year olds in total municipal population) as well as a set of fiscal variables, namely the amount of rule-based transfers per capita, and the municipality-specific tax rate multiplier for the three most important local taxes: the business tax rate, the tax rate of residential property, and the tax rate of agricultural property.

## 4.2 Baseline regressions

Table 1 collects the results for difference-in-difference regressions that relate a dummy for the electoral system to investment transfers. There are ten models because control variables are added successively to investigate the robustness of the estimation results.

Model I is a simple bivariate regression that only controls for the electoral system (in addition to municipal and year fixed effects). The next five models investigate the role of the electoral cycle given that the direct mayor election rule is used. Model II includes an additional variable that differentiates between the effect that the electoral rule has in the election year versus all other years. Models III and IV add two leads and two lags regarding the election year effect, respectively. Model V additionally controls for demographic variables, while model VI is the most complete model that also takes into account fiscal variables.

The results are consistent with the graphical evidence in section 4.2 while also allowing us to investigate the effect of the electoral rule on the allocation of investment transfers more closely. Models I, II and III suggest that the switch to the mayor-council system indeed led to significantly higher investment transfers, but only in the year in which a direct mayor election is held. This finding is consistent with our hypothesis of mayors exerting more effort to attract grants in order to ensure their re-election. In particular, investment grants per capita are about 4.6 to 5.3% higher in municipalities when an election is taking place using the new electoral rule. Since there is a time-lag between the submission of an application to a state ministry, the approval of a grant, and the actual receipt of a grant, it may nevertheless be the case that mayors already start to react to the electoral incentives one or two years ahead of an election.

We additionally learn from model III that one and two years ahead of an election there is an effect whose size is hardly distinguishable from zero even though the coefficients have the expected positive signs. Model IV includes interactions between the direct mayor election dummy and a dummy for the year after an election and two years after an election. We do not

observe any significant effects regarding these two interactions. Overall, we conclude that a significant change in the behavior of mayors due to electoral incentives can only be observed in the election year itself. It should be noted that in model IV, the relevant coefficient is just below the 10 percent level.

When adding further controls on demographic characteristics and fiscal variables, the coefficient that captures the effect of the new regime in election years becomes significant at the 10 percent level and again implies about 5% higher investment grants. We conclude that the effect is robust and is not influenced by control variables which provides further evidence that we are facing a true natural experiment.

Models VII to X additionally investigate electoral cycles in the attraction of investments grants in the old system, i.e. when mayors were appointed by the local council. In the old system, council elections took place every four years starting in 1981, while mayors were appointed every six years. A reasonable conjecture is that in the old system an electoral cycle in grant attraction makes more sense with regard to council elections rather than the date of the mayor appointment. The reason is that appointed mayors had to make sure that the council election results allow him/her to be eligible for reappointment.

**Table 3: ELECTORAL INCENTIVES OF MAYORS UNDER DIFFERENT ELECTORAL RULES AND THE ATTRACTION OF INVESTMENT GRANTS OVER THE ELECTORAL CYCLE, HESSIAN MUNICIPALITIES, 1981-2010**

	(I) b/t	(II) b/t	(III) b/t	(IV) b/t	(V) b/t	(VI) b/t	(VII) b/t	(VIII) b/t	(IX) b/t	(X) b/t
Direct mayor election rule	0.034 (0.731)	0.011 (0.219)	0.028 (0.541)	0.029 (0.543)	0.031 (0.581)	0.031 (0.587)	0.009 (0.186)	-0.008 (-0.114)	-0.014 (-0.188)	-0.015 (-0.198)
Direct mayor election rule*Election year		0.046** (2.049)	0.053** (2.312)	0.048 (1.613)	0.049* (1.655)	0.051* (1.711)	0.045** (2.035)	0.055** (2.345)	0.052* (1.726)	0.054* (1.780)
Direct mayor election rule*Election year-1			0.026 (1.074)	0.022 (0.794)	0.023 (0.851)	0.027 (1.000)		0.028 (1.113)	0.025 (0.921)	0.029 (1.071)
Direct mayor election rule*Election year-2			0.027 (1.179)	0.022 (0.894)	0.023 (0.933)	0.024 (0.999)		0.028 (1.238)	0.025 (1.021)	0.026 (1.086)
Direct mayor election rule*Election year+1				0.008 (0.266)	0.010 (0.338)	0.010 (0.355)			0.013 (0.426)	0.013 (0.445)
Direct mayor election rule*Election year+2				-0.027 (-0.988)	-0.027 (-0.958)	-0.024 (-0.850)			-0.026 (-0.933)	-0.023 (-0.824)
Mayor appointment election rule*Election year							-0.004 (-0.054)	-0.035 (-0.370)	-0.044 (-0.455)	-0.047 (-0.487)
Mayor appointment election rule*Election year-1								-0.102 (-0.870)	-0.111 (-0.939)	-0.110 (-0.934)
Mayor appointment election rule*Election year-2								-0.030 (-0.336)	-0.044 (-0.490)	-0.045 (-0.498)
Demographic control variables	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
Fiscal control variables	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES
Municipalities	421	421	421	421	421	421	421	421	421	421
Observations	12435	12435	12435	12435	12435	12399	12435	12435	12435	12399
F	0.531	2.566	1.636	1.284	2.114	2.105	1.711	1.026	1.638	1.703

<sup>a</sup> The dependent variable is the log of investment transfers per capita.

<sup>b</sup> t-statistics are in parentheses.

<sup>c</sup> Hypothesis tests use heteroscedasticity-robust standard errors. Standard errors are also clustered at the level of the municipality.

<sup>d</sup> Stars indicate significance levels at 10% (\*), 5% (\*\*) and 1% (\*\*\*)

The estimation results in fact suggest that electoral cycles do not exist in the manager-council system. Neither the interaction term with the council election year nor the interaction terms with the two years prior to a council election are significant. On the other hand, the inclusion of these additional variables does not affect the significant result that emerges for the electoral cycles in grant attraction under the direct mayor election rule.<sup>9</sup>

## 5 Extensions

### 5.1 Strategic electoral considerations of the state government

The bulk of the existing literature on the political economy of intergovernmental grants focuses on the role of strategic electoral considerations of the state governments. The key message of this literature is that the state government allocates transfers in a way that maximizes the state government's re-election probability. Hence, the state government is likely to transfer more resources to ideologically aligned municipalities. This may then serve to motivate the mayors of ideologically aligned municipalities to support the state government's election campaign.

Regarding the reform of the electoral rule for mayors in Hesse, one may conjecture that directly elected mayors are better able to garner support for the state government's re-election than appointed mayors. This may serve as an alternative explanation for the significantly positive effect of the new election rule on the allocation of investment grants per capita. The fact that this effect only emerges in the year where a direct mayor election takes place is in line with this theory. However, a missing part of the puzzle is whether the state government – in line with the theory – allocates transfers to municipalities where the

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<sup>9</sup>We also tested whether the effect differs for those mayors that ran again for office in the next election. We do not detect any significant differences.

ideologically aligned mayor won the last direct election by a small margin. This question can be addressed in future investigations with the available data.<sup>10</sup>

*De jure* the allocation of investment grants should be based on objective criteria, namely (i) the submission of a written application explaining how the intended project meets the funding guidelines and (ii) the availability of resources at the state-level. However, it may be that *de facto* there are partisan biases in the approval of grants since for instance the compliance of a project with the respective funding guidelines may be subject to interpretation.

Another powerful test for the role of strategic electoral considerations investigates whether non-aligned directly elected mayors receive more transfers than aligned appointed mayors. If the data indeed indicates such a pattern, it becomes clear that ideological alignment does not play a role and cannot explain the effect of direct mayor elections that is suggested by the analysis in section 4.2. This can also be easily tested as soon as data on party affiliations of mayors in the old system has been collected.

## 5.2 The role of (self-)selection biases of candidates

One may also wonder to what extent the new election rule affects the pool of candidates running for the mayor's office. In the old system, party affiliation was an important implicit prerequisite for being eligible for this office. In the new system, the political legitimization of a mayor is much stronger as the people have directly elected the mayor.

The new system is characterized by a higher exposure to the public in a personalized election campaign and a greater personal satisfaction and reputational reward from winning a direct mayor election. A first type of bias that may arise from this is a *self-selection bias*. It may be the case that different candidates are attracted under the new electoral rule. If

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<sup>10</sup>Note that a "close" election cannot be compared across the two electoral rules since the definitions differ. Therefore, I cannot test whether ideologically aligned incumbent mayors receive more transfers under a direct election rule when they won the last election by a small margin compared to what was the case with close elections under the old rule.

such a difference in candidates' personal characteristics can be observed, one may wonder whether the elected mayors in the new system are more skilled in attracting grants rather than facing a larger electoral incentive as hypothesized in the main part of this paper.

The second type of bias that may play a role is a *selection bias*, i.e. the people prefer other individuals as a mayor than the established local political elite. Voters may for instance be more interested in an individual's charisma, career achievements, and education level, whereas the council majority may prefer a loyal and obedient party member. If any pattern like this could be observed, one may wonder whether the type of candidates preferred by the people is more skilled in or more ambitious regarding the attraction of investment grants.

In order to investigate the existence of selection and self-selection biases, it is first necessary to collect data on the following variables: (i) education level, occupational history, gender, and age of appointed mayors, and (ii) education level, occupational history, gender, and age of elected mayors. One could then compare whether it is indeed the case that officeholders under the old and new system systematically differ.

A related question asks whether and how often it has been the case that an appointed mayor after the switch to the new electoral rule remained in office. If this happened quite often, this would provide some evidence that selection and self-selection issues are not an important issue in this context. In fact, 271 out of 421 municipalities kept their mayor in office even after the change of the electoral rule. This amounts to 64.4% of all municipalities. Moreover, one could investigate whether – in line with our main hypothesis – this same individual acted differently under the two electoral rules.

## 6 Conclusion

This paper uses the unique setting provided through a reform of the election scheme of mayors in the German state of Hesse to investigate how a change in the electoral rule affects



the allocation of intergovernmental transfers from the state tier to 421 municipalities. This reform has been introduced during a phase-in period between 1993 and 1998 and it can be reasonably argued that the exact timing of the first direct mayor election in a specific municipality is exogenous.

I have conducted difference-in-difference estimations using the log of discretionary investment transfers per capita as the dependent variable. I observe a significantly positive effect suggesting that indeed municipalities with directly elected mayors were able to capture a larger amount of transfers per capita. This effect has a certain pattern over the electoral cycle, i.e. it only exists in the year in which a direct mayor election takes place. I regard this as first evidence that incumbent mayors exert more effort in writing project-specific grant applications in order to increase their probability of being re-elected.

Future investigations will analyze the relevance of alternative explanations such as the state government's strategic electoral considerations and the role of selection and self-selection biases of candidates. Moreover, it is of interest to know whether the effect is larger when only the subsample of incumbent mayors is considered who run again for office in the next election. The inclusion of incumbents who reach the end of their career most likely creates a downward bias in the reduced-form effects.

The research question investigated in this paper is of a positive nature. Therefore, it is difficult to derive implications for the optimal design of political systems at the local level. The fact that mayors exert more effort in writing grant applications and attracting resources from the state tier may at first appear as a desirable effect. Yet, this pattern of a political cycle of grant attraction may also be viewed as an undesirable outcome as mayors could possibly use their time in office in a way that is more efficient from the municipality's viewpoint and as the political cycle creates instability in grant receipts over time. The objective of the analysis is to see whether there is an effect of the electoral rule at all. I leave it to the reader to decide whether this is a desirable effect or not.

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