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# **Project Study:**

## **A Causal Test of the “Law of $1/n$ ” and its Mechanisms**

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## List of Abbreviations

**FE** fixed effects

**GDP** gross domestic product

**IV** instrumental variable

**OECD** Organisation for Economic Co-operation and Development

**OLS** ordinary least squares

**RDD** regression discontinuity design

**RE** random effects

**U. S.** United States

**ZEW** Leibniz Centre for European Economic Research

# 1 Introduction

Scholars have long been concerned with the effects of constitutional, political, and electoral rules on policy outcomes in general and public finance in particular. [De Tocqueville](#) (2010, p. 333), for instance, argues that democracies have higher spending than absolute monarchies. [Meltzer and Richard](#) (1981, 1983) assert that the introduction of universal suffrage allowed those more in favor of redistribution to cast their ballots, hence increasing public spending. [Persson et al.](#) (2000) and [Persson and Tabellini](#) (1999, 2004) analyze the differences in public finance outcomes between presidential and parliamentary regimes, concluding that parliamentary regimes (compared to presidential ones) have a tendency towards higher public good provision, more redistribution and higher taxes. [Milesi-Ferretti et al.](#) (2002) examine the relationship between social and geographical constituency with respect to majoritarian and proportional voting systems. They note that majoritarian systems tend to have more spending on public goods, while proportional ones focus on transfers so it is the composition of spending that differs between electoral systems. Total spending depends on the median voter's preference.

This paper focuses on the (causal) effect of legislature size on public spending<sup>1</sup> (“Law of  $1/n$ ”). This effect has been investigated in several papers (see discussion in section 2), including those in Germany. However, while some papers briefly discuss potential mechanisms, none of them go in depth to compare multiple potential mechanisms. This will be the objective of my Master thesis: Investigate the “Law of  $1/n$ ” and its mechanisms in a panel of municipalities of multiple German states. The paper at hand serves as a synthesis of the existing theoretical and empirical literature, aiming to prepare the Master thesis on these topics.

The remainder of this paper is organized as follows: Section 2 deals with the theoretical effects of council size on government expenditure while also perusing empirical evidence. Section 3 is concerned with mechanisms for this effect discussed in the literature. Specifically, different political systems, different types of expenditures, as well as councilors' characteristics are presented as possible mechanisms driving the “Law of  $1/n$ ”. Section 4 will give a brief outlook at what the Master thesis might look like, before section 5 concludes.

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<sup>1</sup>The expressions “government size”, “government expenditure”, “public budget”, “public spending” or combinations of these are used interchangeably throughout this paper.

## 2 Effects of Council Size on Public Spending

This section will examine the existing evidence on the “Law of  $1/n$ ”. Therefore, I will first discuss theoretical predictions and then review empirical results.

### 2.1 Theoretical Considerations

Weingast et al. (1981) laid the theoretical foundation for this strand of research. In their seminal paper, they assume legislators to be elected in their local electoral district (p. 644). They have to decide on a project for district  $j$ ,  $P_j(x)$ , with  $x$  being the size of the project. Solely in district  $j$ , citizens derive economic benefits from the project,  $b(x)$  with  $\frac{\delta b}{\delta x} > 0$ ,  $\frac{\delta^2 b}{\delta x^2} < 0$ , so  $b(x)$  can be targeted geographically. The total cost  $c(x)$  comprises three separate cost components  $c_i$ ,  $i = 1, 2, 3$ . The authors assume  $\frac{\delta c_i}{\delta x} > 0$ ,  $\frac{\delta^2 c_i}{\delta x^2} \geq 0$ . Resource expenditures spent within the district are defined as  $c_1(x)$ , expenditures outside the district are called  $c_2(x)$ , and  $c_3(x)$  are external costs in the constituency. The total (non-external) costs of  $P_j(x)$  is financed by a tax,  $T(x) = c_1(x) + c_2(x)$ , that is levied by all  $n$  districts. District  $i$  bears a share of the burden,  $t_i \geq 0$ , with  $\sum_{i=1}^n t_i = 1$  (pp. 644-645).

A benevolent policy-maker would maximize total net utility (p. 646):

$$\max_x E(x) = b(x) - c(x). \quad (1)$$

The first-order condition is:

$$\frac{\delta b}{\delta x} - \frac{\delta c}{\delta x} = 0. \quad (2)$$

When marginal benefits equal marginal cost, this yields a project of size  $x^E$ .

However, once expenditures are politicized,  $x$  deviates from the social optimum (pp. 651-652). Seeking reelection, representatives are assumed to aim to maximize their district’s net benefit as they try to guarantee funding for projects in *their* constituency which are financed by taxes that mainly fall on *other* constituencies. This results in overspending, compared to the social optimum.

More formally, councilor  $j$  maximizes:

$$\max_x N_j(x) = b(x) + c_1(x) - t_j T(x) - c_3(x) \quad (3)$$

with the first-order condition

$$\frac{\delta b}{\delta x} + \frac{\delta c_1}{\delta x} = t_j \frac{\delta T}{\delta x} + \frac{\delta c_3}{\delta x} \quad (4)$$

for a project in their constituency, resulting in size  $x^N$  (pp. 652-653). As  $x^N > x^E$  in a politicized setting, project sizes and expenditures are larger than optimal (“pork barrel”). Assuming that taxes are spread evenly across all  $n$  constituencies (“generalized taxation”),  $t_i = 1/n$ , each district bears only a small fraction of the cost. With the norm of “universalism”, all proposed projects receive approval in an omnibus bill (Primo & Snyder, 2008, p. 477). This is what the authors refer to as the “Law of  $1/n$ ” (Weingast et al., 1981, p. 654). To summarize, councilors try to secure projects for their (geographically defined) constituency that are financed by the “common pool”, i. e. mainly by others, creating an externality. They conclude that with the tax share  $t_i$  commonly decreasing in the number of constituencies  $n$ , inefficiency, defined as  $x^N - x^E$ , increases in  $n$ . If each ward  $i$  is represented by one legislator, public spending is expected to increase in council size. Several different theoretical models of legislative decision-making derive similar conclusions (Baron, 1991; Buchanan & Yoon, 2002; Chari & Cole, 1995).

In an extended Weingast et al. (1981) model, however, Primo and Snyder (2008) show that public spending does not depend on council size per se but on a multitude of variables, potentially leading to a reverse of the “Law of  $1/n$ ” where a higher number of representatives results in *less* spending.

Bel et al. (2018a, pp. 45-49) introduce to the literature the idea of the density of representation in a municipality, i. e. the number of legislators per inhabitant (based on similar arguments put forward by Thornton & Ulrich, 1999). They distinguish three phases of this density. In the initial phase with a low density, many constituents monitor few legislators, leading to public expenditures decreasing in the density owing to better monitoring possibilities of councilors’ rent-seeking actions (fewer citizens per councilor). The second phase is the “Law of  $1/n$ ” extensively described earlier where an increase in legislators (density of representation) results in more spending. In the last phase, government size decreases again in the density of population due to rising decision-making cost. To sum up, the relationship between density of representation and government spending is S-shaped.

Municipal elections of councilors may take place in three different ways, either in wards (where each electoral district of a jurisdiction elects one legislator), at-large (the entire jurisdiction elects a fixed number of councilors), or in a mixture of these two. The initially presented [Weingast et al. \(1981\)](#) model refers to the former so we cannot *a priori* derive a clear prediction for mixed and at-large electoral systems. Only in ward elections, politicians are expected to exhibit “pork-barrel” seeking behavior as legislators elected at-large are thought of as treating the whole jurisdiction as their constituency, suppressing the externality of “pork barrel” spending. However, it has been argued that at-large elected legislators have “home bases” ([Baqir, 2002](#), p. 1342) as well which in this case are not defined geographically but by ethnic, cultural, or economic characteristics of the entire jurisdiction. Despite these limitations, the [Weingast et al. \(1981\)](#) model is frequently cited in empirical assessments of the “Law of  $1/n$ ”, no matter the electoral system of the setting at hand ([Pettersson-Lidbom, 2012](#), p. 269). In fact, almost all empirical papers mentioned in section 2.2 refer to this model.

In order to settle this theoretical dispute, empirical evidence is needed. Hence, I next turn to evidence from the data.

## 2.2 Empirical Evidence

[Weingast et al.’s \(1981\)](#) model can be tested in a number of different ways. While I will focus on the literature concerning the effect of council size on spending, one can also test which legislators contribute more to the “pork barrel” problem (e. g. representatives from more populated areas in [Halse, 2016](#)). Alternatively, one can also attempt to trace back to which regions the funds assigned from a higher political level are allocated ([Aidt & Shvets, 2012](#)) or look at individual representative’s votes ([Del Rossi & Inman, 1999](#); [Knight, 2004](#)). [Aidt and Shvets \(2012\)](#) develop a model in which a councilor, who may serve up to two terms, brings home less “pork” in their last term, compared to the first one owing to missing reelection incentives. This end-of-tenure effect is predicted to be smaller if a state has more electoral districts, pointing to the “Law of  $1/n$ ”. This, however, does not apply to Germany where councilors do not face term limits. To sum up, I will focus on how political arrangements, in this case the size of legislature, affect public finance decisions and, more specifically, government spending.

### 2.2.1 “Conventional” Empirical Literature

The easiest and most obvious way to determine the effect of council size on public spending is to run a simple ordinary least squares (OLS) linear regression:

$$Y_{it} = \alpha + \beta CS_{it} + \gamma X'_{it} + \varepsilon_{it} \quad (5)$$

where  $Y_{it}$  is the amount of government spending,  $CS_{it}$  is the number of municipality council seats, and  $X'$  is a vector of covariates. However, this regression potentially suffers from reverse causality as well as omitted variable bias. Reverse causality may arise from the fact that a municipality with a larger public budget faces more complex budget negotiations and hence may need more councilors (Pettersson-Lidbom, 2012, p. 269). If this is indeed the case, one would expect  $\beta$  to overestimate the true causal effect of council size. Omitted variable bias may also be at play because even with a large number of control variables one can not completely rule out confounders (Höhm, 2017, p. 347). Depending on the sign of the association with council size and public spending, this bias could go either way. More precisely, if voters who prefer a larger number of councilors also want higher spending, the relationship between council size and government size might be spuriously correlated (Egger & Koethenbueger, 2010, pp. 201, 204), again resulting in an overestimate of the true effect.

The “conventional” empirical literature has largely ignored these econometric issues. Nevertheless, the following paragraphs will give an overview of the “conventional” empirical papers which predominately refrain from using quasi-experimental methods.

Empirical evidence focuses mainly on the United States (U. S.). Bradbury and Stephenson (2003, pp. 191-195) find council size to have a positive effect on government spending in local elections in the U. S. state of Georgia, where councilors are elected both at-large and in a district system. One additional legislator is expected to raise spending by 4-5 %. Whether or not the counties hold at-large or ward elections, however, does not matter for the size of government.

Distinguishing between the lower and the upper chamber of bicameral legislatures, Gilligan and Matsusaka (1995) employ panel data on 48 U. S. states ranging from 1960 to 1990. Their fixed effects (FE) regressions show a highly significantly positive effect of an increase in the number of legislators in the upper chamber on public expenditure of 10 \$ per capita, a rather small effect. They do not find an effect in the lower house, a result that they cannot rationalize (Gilligan & Matsusaka, 1995, p. 400; Gilligan & Matsusaka, 2001, p. 79). Gilligan and Matsusaka (2001) extend their analysis in a very similar paper using data for four years of the first half of the 19th century, with very similar findings.

Similarly, Bradbury and Crain (2001, pp. 318-319) use country observations from 1971 to 1989 to conclude that chamber size has a positive effect on public spending (models with country- and time-FE). An increase in the number of representatives in the lower



chamber by one percent leads to an increase in government size (spending relative to gross domestic product (**GDP**)) by 0.08 percent, confirming the “Law of  $1/n$ ”, even though their results for the (politically less important) upper house are rather ambiguous. Bicameralism is found to limit the effects of chamber size on public spending (Bradbury & Crain, 2001, pp. 319-322). Interestingly, Bradbury and Crain’s (2001) results are contrary to the ones from Gilligan and Matsusaka (1995, 2001) who do find an effect for the upper but not the lower chamber.

Baqir (2002) examines a cross section of **U. S.** cities and finds that an additional seat in an average city council is expected to increase public expenditures by 1.6 percent, with no difference between at-large and districting electoral systems. He then tests the hypothesis of reverse causality explained above, arguing that council size is rarely changed in the **U. S.** due to the high cost of doing so (Baqir, 2002, pp. 1324-1328). By running an instrumental variable (**IV**) regression with council size thirty years earlier as an instrument, he finds that the **IV** estimates are larger than the **OLS** ones, suggesting that the latter *underestimates* the causal effect (Baqir, 2002, pp. 1332-1338). This contradicts what I laid out above regarding reverse causality.

To account for a possible omitted-variable bias arising from time-constant city-specific factors, MacDonald (2008) employs a panel approach using data from **U. S.** cities from 1980 to 2000. Leveraging just cross-sectional variation, she is able to replicate prior findings of a positive effect of council size on government size. However, once she exploits the time dimension of the data set via **FE**, she no longer is able to find a positive effect of council size on spending.

Aidt and Shvets (2012, pp. 17-22) empirically examine their model explained above and find, using state-specific year and legislator-**FE** in a districting setting of seven **U. S.** states, that legislators in their final term channel less money into their constituencies. As predicted by their theory, this final-term effect decreases (in absolute terms) in the number of districts: The higher the number of electoral districts, the higher the spending.

Turning to countries other than the **U. S.**, Fiorino and Ricciuti (2007), using 1980-2000 data from Italian regions and mainly exploiting cross-sectional variation, find a positive effect of legislature size on public expenditures.

Drew and Dollery (2017), using a random effects (**RE**) estimator, apply this research idea to the municipalities of the Australian state of Victoria. The number of legislators does not significantly determine public spending per se. However, they do find a positive effect of the number of wards on spending (plus 3.4 % for an additional district), in line with theory.

Bel et al. (2018a) analyze Portuguese municipalities (2009-2013) whose councilors are elected in a mixed electoral system, partly at large and partly in each district, based on uniform national regulations. Employing a FE approach similar to MacDonald (2008), they report that they do not find significant results for the effect of total council size as well as the number of directly elected legislators on total spending (Bel et al., 2018a, p. 45; Bel et al., 2018b, Appendix A). They do, however, find evidence for their density of representation theory of an S-shaped relationship between council size and spending, in a FE model, where density of representation is represented by a cubic function (Bel et al., 2018a, pp. 52-56).

The idea of larger political institutions leading to higher government expenditure can also be applied to governments instead of legislatures (Roubini & Sachs, 1989a, 1989b). In a panel of Organisation for Economic Co-operation and Development (OECD) countries, Perotti and Kontopoulos (2002) find that larger cabinets contribute to raises in public spending (and deficits) and so does coalition size (i. e. the number of parties of the coalition). Similarly, Schaltegger and Feld (2009) examine a panel of Swiss cantons. They expect ministers to maximize their respective ministry's budget, hence again creating the common pool problem, albeit on a different level. The authors find that cabinet size is positively related to spending (and revenue), while the results of coalition size on spending (and revenue) are mixed, depending on the model specification as OLS or FE. The former yields positive results, the latter negative ones. Baskaran (2013) runs a similar analysis on German states, finding a significant effect (of less than 1 %) of the number of ministers on real expenditures, especially affecting the spending categories health, public safety, and infrastructure.

## 2.2.2 Quasi-Experimental Methods

Still, the FE approach is problematic in two ways. First, changes of council size within municipalities typically occur very rarely (and in addition, might be endogenous). Hence, researchers frequently need to rely on cross-sectional differences for identification (Egger & Koethenbuerger, 2010, p. 201). Secondly, while the FE approach is a remedy to year- and/or region-specific effects, endogeneity might still be an issue if omitted-variable bias related to *other* factors not specific to years and regions, or reverse causality are at play.

Egger and Koethenbuerger (2010) and Pettersson-Lidbom (2012) advanced the causal inference literature on this topic by introducing regression discontinuity design (RDD) (Angrist & Lavy, 1999; Black, 1999; Hahn et al., 2001; Lee, 2008; Pettersson-Lidbom, 2008; Thistlethwaite & Campbell, 1960) to the “Law of  $1/n$ ”. Due to the endogeneity

of the regression equation detailed above, researchers should turn to quasi-experimental methods in order to find a causal effect of council size on government size.<sup>2</sup>

**RDDs** are quasi-experiments in that they randomly divide observations close to a cutoff of an exogenous variable (in this case: population) into treatment and control group, mimicking a randomized controlled trial when, in the end, changes in the dependent variable  $Y_{it}$  may only occur due to exposure to treatment (with a larger council as the (binary) treatment). The approach is valid as long as a set of assumptions can reasonably be expected to hold:

- Continuity of potential outcomes.
- No manipulation of the running variable, i. e. no sorting.
- No other policies change at these cutoffs.

**RDDs** are typically estimated via the following equation:

$$Y_{it} = \alpha + \beta \mathbb{1}(pop_{it} \geq pop_0) + \delta \times f(pop_{it}) \times \mathbb{1}(pop_{it} \geq pop_0) + \gamma X'_{it} + \varepsilon_{it} \quad (6)$$

where  $pop_0$  indicates the threshold value where an increase in council size  $CS_{it}$  takes place,  $\mathbb{1}(pop_{it} \geq pop_0)$  is the RDD dummy, and  $f(pop_{it})$  is a potentially nonlinear function of the assignment variable (population) and an interaction with the  $\mathbb{1}(pop_{it} \geq pop_0)$  dummy.

**RDDs** can be distinguished into sharp and fuzzy designs (Imbens & Lemieux, 2008). In the former case, treatment assignment deterministically depends on the running variable, whereas in the latter case, assignment into treatment occurs stochastically. That is, the propensity of being assigned into treatment jumps at the threshold but not from 0 to 1 as in the sharp design. The external validity of the **RDD** approach is limited in that the interpretation of  $\beta$  is only possible locally at the threshold (even more so under the assumption of heterogeneous treatment effects).

Pettersson-Lidbom (2012) studied Finnish and Swedish local elections whose council sizes are exogenously determined by population size and number of eligible voters, respectively. He finds that in both countries, public spending decreases in council size, a result that contradicts conventional theory (i. e. Weingast et al., 1981). However, in both countries representatives are elected at large so strictly speaking the Weingast et al. (1981) model is not applicable in this case.

<sup>2</sup>There is also a number of effects of council size that are open to exploration using **RDD** such as corruption (de Britto & Fiorin, 2016) or other indicators of policy performance (e. g. economic outcomes, crime rates or COVID cases).

Using an **RDD** in a setting of Brazilian municipalities, [Kresch et al. \(2020, pp. 12-13, 24\)](#) find that administrative expenditures do not statistically significantly change at the cutoff (with the exception of spending on public employment) but do increase for more social expenditure categories such as education, housing, and social assistance. In a similar **RDD** setting of municipalities in Brazil, [Correa and Madeira \(2014\)](#) and [de Britto and Fiorin \(2016, pp. 11-12, 25–26\)](#) find no effect of council size on total expenditures (and total revenues) either.

[De Benedetto \(2018\)](#) analyzes a setting of Italian municipalities from 2001 to 2007. Applying a sharp **RDD** based on population thresholds, he finds a negative effect of legislature size on total public spending at the discontinuities. For a one-seat increase in council size, expenditure falls by approximately 0.5 %.

[Lewis \(2019\)](#) tests the “Law of  $1/n$ ” in Indonesia via sharp **RDD**. He finds a negative effect on municipal expenditures: A five-legislator council size raise results in a 17-21 % increase in public spending while own-resource revenues do not increase significantly.

[Hirota and Yunoue \(2012\)](#) use Japanese data from the 2001-2006 period. Exploiting both sharp and fuzzy council size rules based on population, the authors always find a significantly positive elasticity of government spending with respect to council size in their **RDDs**. In their preferred specification, the elasticity amounts to 1.2 %. By spending category, the elasticity is highest for the primary economic sector, civil engineering work spending, and welfare spending, all of which can be considered public projects, consistent with theory. The additional expenditures are mainly financed by newly issued public debts.

More interesting for my application, however, are papers using a German setting, of which there are three: [Egger and Koethenbuerger \(2010\)](#), [Höhmman \(2017\)](#), and [Holzmann and Zaddach \(2019\)](#).

[Egger and Koethenbuerger \(2010\)](#) analyze the Bavarian setting, using data from 1984 to 2004. Bavarian municipality councils are elected at-large and their majors tend to have a rather strong position in the local political system. Despite these two factors which ought to curb the externality of overspending, they find a positive effect of council size on spending, using an **RDD** with population as the running variable and consistent with what [Weingast et al.’s \(1981\)](#) model predicts. Quantitatively, the effect at the cutoff amounts to an 11 % jump of expenditures. Given that the number of representatives increases by 2.6 on average at the threshold, one additional council seat leads to a 4 percentage-point increase in spending.

Höhmnn (2017) extends Egger and Koethenbuerger's (2010) idea by including 11 states with data ranging from 2008 to 2010 in his analysis. Contrary to Egger and Koethenbuerger (2010), he finds a negative effect of council size on government spending. At the cutoff, one additional seat in the legislature can be expected to decrease spending by 1 % (total jump at cutoffs: -3 %), rejecting the hypothesis of the "Law of  $1/n$ ". Given the time frame, a time of economic recession caused by the global financial crisis, this may have been driven by tight financial budgets and few leeway to enact pork barrel spending, the author notes. He also addresses concerns over one of the identifying assumptions of the RDD, namely that nothing else must change at the cutoff. In German municipalities, the cutoffs used to determine the council size also ascertain a number of other aspects, e. g. the mayor's salary. He re-runs the RDD excluding 64 of the 178 cutoffs and shows that the treatment effect decreases slightly to 0.02 (previously: 0.03). Many of the cutoffs are fuzzy as councils in some states have the right to autonomously increase or decrease the number of council seats up to a certain amount, depending on state-level regulations.

Holzmann and Zaddach (2019) revisit the German evidence for the "Law of  $1/n$ ". Employing data from Lower Saxony from 1992 to 2006, where councils are elected at large, they do not expect, and in fact do not find, any effect of council size on size of government when using only "clean" thresholds, i. e. cutoffs where no other policies change. Interestingly, unlike Höhmnn (2017), they do find that there is a change in treatment effect size when including confounded thresholds. When they include those, the treatment effect is in the same order of magnitude as Egger and Koethenbuerger's (2010), indicating that the effect size found by the latter might be driven by confounded discontinuities.

To conclude this section, early studies on the "Law of  $1/n$ " have often found positive effects of council size on public spending. However, it is questionable if they have indeed identified a causal effect due to the econometric issues discussed above. A recently emerging literature has increasingly focused on leveraging RDDs to estimate causal effects of the "Law of  $1/n$ ". The results of these analyzes are mixed, with some finding positive effects, some finding negative effects, and others not being able to reject the  $H_0$  of no effect at all. This is mirrored by the German studies presented which are not at all able to deliver clear results. This summary is also consistent with the results of a recent meta-analysis conducted by Freire et al. (2021).

In addition to this, the literature lacks a comprehensive test of different mechanisms explaining the "Law of  $1/n$ ". This is dealt with in the subsequent chapter.

## 3 Proposed Mechanisms

How can we rationalize the effects of council size on public spending, be they negative or positive? What are the mechanisms behind these effect? This stands to be investigated in the following chapter. Table 2 in the [Appendix](#) gives an overview of all mechanisms that can be considered.

I will only include ideas that might be testable at the local level. Aspects such as bicameralism ([Bradbury & Stephenson, 2003](#)) can hardly be tested at the municipal level, for obvious reasons.

### 3.1 Different Political Systems

[Pettersson-Lidbom \(2012\)](#) who finds a negative effect of council size on spending in two Scandinavian countries proposes a bureaucrat-council agency problem. Since (especially non-professional) councilors are heavily time-constrained, they are forced to delegate some decisions onto the bureaucracy. While representatives are assumed to be fiscally conservative, bureaucrats are expected to maximize budgets, resulting in an agency conflict. An increase in the number of representatives may now lead to proper agency supervision, lowering government spending ([Pettersson-Lidbom, 2012](#), p. 270). Considering two spending categories – operational expenditure and public employment – which are assumed to be mainly determined by bureaucrats, he finds a negative effect of council size, suggestively confirming the theory. In a similar vein, he tests for oversupply of public projects by examining the effect of council size on capital expenditures which shows no effect at all ([Pettersson-Lidbom, 2012](#), p. 276-277).

[Baqir \(2002, pp. 1342-1347\)](#) who analyzes [U. S.](#) cities shows that at-large councils exhibit the same spending patterns as district councils. He explains this finding by at-large elected representatives also having “home bases” ([Baqir, 2002](#), p. 1342) defined for example by ethnic, cultural, or economic characteristics of the entire jurisdiction (instead of geographical constituencies in the districting council case). [Dalenberg and Duffy-Deno \(1991\)](#) analyze a cross-section of [U. S.](#) municipalities, finding that the latter electoral systems have higher public capital stocks (by about one percent) than at-large ones. Ward systems incentivize logrolling more than at-large elections do owing to the “pork barrel” externality. [Farnham \(1990\)](#), however, does not find any significant effects (nor for the role of the mayor, for that matter). [Southwick \(1997\)](#) reports higher debt, total spending, and taxes in ward systems relative to at-large cities for a number of [U. S.](#) cities. [Drew and Dollery \(2017\)](#), too, find a positive association of councils with a ward



structure, i. e. those where representatives have a geographically determined home base.

As a hypothesis for the German setting, one could test whether the “Law of  $1/n$ ” effect is smaller in mixed electoral systems (e. g. the state of North Rhine-Westphalia) than in pure at-large ones (e. g. Bavaria). Pure ward elections do not take place at this German level.

Furthermore, the particularly strong role of German municipal mayors is speculated (but not tested) to be one of the reasons for Höhmann’s (2017) finding of a negative council size effect. Their strong position (for instance, they are directly elected with a veto to block council decisions) allows them to exercise a considerable amount of power, possibly internalizing the total cost of projects. For the U. S., Baqir (2002, pp. 1347-1351) examines the difference in spending between mayor-council and council-manager systems, theoretically predicting that the former would better be able to internalize the cost externality due to their strong role, compared to the mayor-manager. He concludes that this is indeed the case as strong mayors are able to curb the positive effect of council size on spending.

As for the Master thesis, one might try to exploit differences in local constitutions between states to investigate the effect of different mayoral positions on the “Law of  $1/n$ ”.

It might also be argued that a larger legislation allows more (and more diverse) parties to enter parliament, leading to more public spending. Kresch et al. (2020) do not only find an increase in social spending at Brazilian thresholds but also an increase in parties elected into the legislation (similarly Correa & Madeira, 2014). Even though the authors do not test this, it might be possible that the increase in parties represented in parliament mediates this effect. Additionally, de Britto and Fiorin (2016, pp. 13, 27) analyze the political fragmentation using the Herfindahl-Hirschman index. Different from Kresch et al. (2020) outlined above, they do not find an effect on the number of parties or the political fragmentation. Mukherjee (2003) finds evidence for the effect of the number of different parties in parliament on government expenditure in a sample of 110 countries (data ranging from 1980 to 1996), arguing that with more parties in parliament, more parties need to be included in coalitions, which leads to the effect mentioned. The effect is nonlinear due to parties falling short of important thresholds (majority or supermajority) spending more in order to attract coalition partners. For countries with parties whose vote shares are above these thresholds, however, public expenditure falls.

Finally, it is only natural to look at which district characteristics promote these effects. An idea that would not require more data than what is used in the prior exercise would be to check which discontinuities favor the “Law of  $1/n$ ”: For instance, the effect might be driven by small municipalities (in terms of population, [Hirota & Yunoue, 2012](#)).

### 3.2 Different Types of Expenditures

[Egger and Koethenbueger \(2010, p. 209-210\)](#) further examine which types of expenditures are favored by councils slightly above the discontinuity. They note that legislators prefer more visible and more immediate projects, e. g. personnel expenditure increases by 17 % at the cutoff whereas investment expenditure increase by much less (10 %). Regarding the revenue side, [Egger and Koethenbueger \(2010, pp. 210-211\)](#) show that at the cutoffs, legislators prefer property tax hikes over profit tax hikes, presumably because companies are more mobile. The effect of council size on debt (at the threshold) is only significant at the 10 % significance level.

[Kresch et al. \(2020, pp. 12-13, 24\)](#), examining Brazilian municipal councils, find that in four categories of administrative spending, only one proves statistically significant whereas out of the four social expenditures categories, the two largest categories are significant.

While [de Britto and Fiorin \(2016, pp. 11-12, 25–26\)](#) find no effect on total expenditures, they do, however, find a positive effect of what they consider clientelistic spending in that this kind of expenditure can be properly targeted to certain groups. Additional spending (at the discontinuity) might be aimed at specific groups.

Testing all these theories with regard to expenditure categories heavily depends on the granular level of the data available. If possible, I would like to analyze these ideas in the German setting as well.

### 3.3 Effect of Councilors’ Characteristics

An increase in the number of seats might increase the degree of diversity of councilors represented in local assemblies. One of these councilor characteristics might be the councilors’ gender.

[De Britto and Fiorin \(2016, pp. 13, 27\)](#) do not find any differences in characteristics of legislators at the threshold in Brazilian municipalities except for the likelihood of having at least one woman in the council and the mean representative’s age. [Correa and](#)



Madeira (2014) observe similar effects for the same setting but with a larger data set with respect to time. The number of women elected increases by 50 % at the cutoff. According to the authors, more seats attract primarily male candidates even though the vote share for candidates by gender is not changed by the raise in council size, improving female representation in councils. This, in turn, leads to higher spending in expenditure categories typically more aligned with women's preferences.

In general, women are found to have different policy preferences than men. Regarding public spending for example, they prefer higher expenditures, especially for social purposes (Abrams & Settle, 1999; Aidt & Dallal, 2008; Lott & Kenny, 1999). There appears to be a similar pattern for women in councils, who positively affect public spending (Besley & Case, 2003, pp. 45-46; Chattopadhyay & Duflo, 2004; Svaleryd, 2009).

This effect of larger councils leading to higher female representation and thus increasing spending in general as well as tilting spending towards different expenditure categories can be tested using German data as well.

## 4 Outlook

The penultimate section ought to give an overview of how the research design of my Master thesis might look like. Contrarian findings, limited samples (single states or several states but in an economic downturn), few examinations of the mechanisms (e. g. no empirical check by Höhmann, 2017) motivate further research on this topic.

### 4.1 Background

Germany is organized as a federal state. Municipalities are the lowest political level of the German political system. They are tasked with executing state and federal-level laws on the one hand and (more or less) voluntary matters on the other (Rudzio, 2015, p. 358). The latter includes cultural matters, education, public transportation, and social institutions such as kindergartens, schools, or hospitals (Naßmacher & Naßmacher, 2007, pp. 111-112; Rudzio, 2015, p. 358).

Local elections are subject to state ("Bundesland") regulations and held at the same time in each respective state. All states require that council size be a (deterministically or stochastically) discontinuous function of population so that RDDs are a viable research design in this setting. Since the German city states have quite a different setting of their

boroughs, they are excluded from the analysis (similar to Höhmann, 2017), leaving me with 13 German states.

When using population cutoffs in RDDs, it is important to be cautious for two particular reasons (Ade & Freier, 2011; Eggers et al., 2018): First, Eggers et al. (2018, pp. 217-227) find evidence of sorting around important population thresholds in three European countries, including Germany. Secondly, in many settings multiple policies change at the same cutoffs (while the researcher is solely interested in one policy). One can either separately analyze only nonconfounded thresholds (Höhmann, 2017, pp. 355-356) or, if feasible, apply a “difference-in-discontinuity” design, testing separately for the effects of confounding policy changes (Eggers et al., 2018, pp. 212-216; Grembi et al., 2016). As for the Höhmann (2017) approach, table 1 documents that Höhmann left in some of the confounded thresholds even though asserting to sort those out. This does not only happen in the case of Saxony but also for other states and might have serious consequences. If some of the effects found in the study are driven by other changes at these cutoffs, it might have biased Höhmann’s results. This problem will be discussed in more depth in the Master thesis.

## 4.2 Data Availability

A data set with a number of municipal covariates was kindly provided to me by the Leibniz Centre for European Economic Research (ZEW). Starting in 2002, it was first used by Asatryan et al. (2017) and has continuously been updated until 2019. This data set, however, does neither contain election results nor council size.

Rademacher (2018) is a collection of German municipal elections results. According to its codebook (Köglmeier, n.d., p. 5), it covers 92 % (66 out of 72) of all German municipal elections from 1990 to 2016. Upon further exploration, however, these data provide certain limitations as the seat distribution among parties as well as the total number of council seats does not appear to play a huge role in the data set. Given the elections in the data set since 2002, for six of the German states, more than 10 % of the election-municipality observations have missing data, with two states missing over 85 % and another missing entirely. Moreover, all but three states have at least one local election missing from the data set between 2016 and 2019, which is the end of the Asatryan et al. (2017) data set. As a consequence, it is necessary for me to collect additional election data from the state statistical agencies.

A further challenge consists in finding appropriate population data which, as the running variable, are of high importance. Regulations as to which data to use to determine

Table 1: Municipal Council Size Thresholds in Saxony and Confounding Institutional Changes

Population	Council Size	Non-Confounded Threshold According to Höhmann (2017)	Actual Non-Confounded Threshold	Other Policy Changes
0 - 500	8			
501 - 1,000	10	✓	✓	
1,001 - 2,000	12	✓	✓	
2,001 - 3,000	14	✓	✗	Number of signatories for candidates increases Wage of mayor increases
3,001 - 5,000	16	✓	✓	
5,001 - 10,000	18	✗	✗	Mayor must work full-time Number of signatories for candidates increases Wage of mayor increases
10,001 - 20,000	22	✗	✗	Municipalities (not “discript-free cities”) may opt for deputy mayors Number of signatories for candidates increases Wage of mayor increases
20,001 - 30,000	26	✗	✗	Accounting agency Full-time equal opportunities officer Number of signatories for candidates increases (since 2013) Wage of (deputy) mayor increases
30,001 - 40,000	30	✗	✗	Groups in parliament must receive funds (since 2014) Maximum number of deputy mayors increases Wage of (deputy) mayor increases
40,001 - 50,000	34	✓	✗	Wage of (deputy) mayor increases
50,001 - 60,000	38	✗	✗	Number of signatories for candidates increases
60,001 - 80,000	42	✗	✗	Maximum number of deputy mayors increases Wage of (deputy) mayor increases
80,001 - 150,000	48	✓	✓	
150,001 - 400,000	54	✓	✓	
≥ 400,001	60	✗	✗	Maximum number of deputy mayors increases

The table is based on Höhmann (2017, table 5, p. 363) who uses data from 2008-2010. Höhmann’s research regarding these cutoffs was updated based on laws in force for the 2005-2019 time period. The check mark “✓” indicates a “clean”, non-confounded discontinuity whereas “✗” means the cutoff is confounded. Tables for the other twelve states are available upon request.

council size also differ between states and do not rely on the yearly published population data (as of December 31 of each year) typically used in statistical analysis. North Rhine-Westphalia, for instance, mandates that population data that is updated biannually and published 42 month after the start of the electoral term by the state-statistical agency be used to determine council size (Ministry of the Interior of North Rhine-Westphalia, 2020, § 78 (1)).

## 5 Conclusion

The paper at hand serves as a preparation for my Master thesis. The theory part presented the Weingast et al. (1981) paper whose implications are the main theory for investigating

the “Law of  $1/n$ ”. In addition, the theory’s limitations are discussed, along with two less relevant theories. After that, the empirical literature is discussed, distinguishing between the more “conventional” empirical evidence, using linear regressions (partly with **FE**), and **RDDs**, a quasi-experimental method. Finally, I presented the setting and the data available.

The projected research question for the Master thesis concerns the effect of council size on public spending (“Law of  $1/n$ ”) based on a fuzzy **RDD** with population as the forcing variable. A special focus will be on the mechanisms driving the effect. The setting are German municipalities. Ideally, all municipalities of 13 states will be included over the period of 2002 to 2019 but this is subject to data availability.

## References

- Abrams, B. A., & Settle, R. F. (1999). Women's suffrage and the growth of the welfare state. *Public Choice*, 100(3/4), 289–300. <https://doi.org/10.1023/A:1018312829025>
- Ade, F., & Freier, R. (2011). When Can We Trust Population Thresholds in Regression Discontinuity Designs? *DIW Berlin Discussion Papers*, (1136). Retrieved January 25, 2022, from [https://www.diw.de/documents/publikationen/73/diw\\_01.c.376204.de/dp1136.pdf](https://www.diw.de/documents/publikationen/73/diw_01.c.376204.de/dp1136.pdf)
- Aidt, T. S., & Dallal, B. (2008). Female voting power: the contribution of women's suffrage to the growth of social spending in Western Europe (1869–1960). *Public Choice*, 134(3-4), 391–417. <https://doi.org/10.1007/s11127-007-9234-1>
- Aidt, T. S., & Shvets, J. (2012). Distributive Politics and Electoral Incentives: Evidence from Seven US State Legislatures. *American Economic Journal: Economic Policy*, 4(3), 1–29. <https://doi.org/10.1257/pol.4.3.1>
- Angrist, J. D., & Lavy, V. (1999). Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement. *The Quarterly Journal of Economics*, 114(2), 533–575. <https://doi.org/10.1162/003355399556061>
- Asatryan, Z., Havlik, A., & Streif, F. (2017). Vetoing and inaugurating policy like others do: evidence on spatial interactions in voter initiatives. *Public Choice*, 172(3-4), 525–544. <https://doi.org/10.1007/s11127-017-0460-x>
- Baqir, R. (2002). Districting and Government Overspending. *Journal of Political Economy*, 110(6), 1318–1354. <https://doi.org/10.1086/342804>
- Baron, D. P. (1991). Majoritarian Incentives, Pork Barrel Programs, and Procedural Control. *American Journal of Political Science*, 35(1), 57. <https://doi.org/10.2307/2111438>
- Baskaran, T. (2013). Coalition governments, cabinet size, and the common pool problem: Evidence from the German states. *European Journal of Political Economy*, 32, 356–376. <https://doi.org/10.1016/j.ejpoleco.2013.09.009>
- Bel, G., Raudla, R., Rodrigues, M., & Tavares, A. F. (2018a). These rules are made for spending: testing and extending the law of 1/n. *Public Choice*, 174(1-2), 41–60. <https://doi.org/10.1007/s11127-017-0488-y>
- Bel, G., Raudla, R., Rodrigues, M., & Tavares, A. F. (2018b). These rules are made for spending: testing and extending the law of 1/n: Supplementary material 1. *Public Choice*, 174(1-2), 41–60. Retrieved January 30, 2022, from [https://static-content.springer.com/esm/art%3A10.1007%2Fs11127-017-0488-y/MediaObjects/11127\\_2017\\_488\\_MOESM1\\_ESM.doc](https://static-content.springer.com/esm/art%3A10.1007%2Fs11127-017-0488-y/MediaObjects/11127_2017_488_MOESM1_ESM.doc)

- Besley, T., & Case, A. (2003). Political Institutions and Policy Choices: Evidence from the United States. *Journal of Economic Literature*, 41(1), 7–73. <https://doi.org/10.1257/002205103321544693>
- Black, S. E. (1999). Do Better Schools Matter? Parental Valuation of Elementary Education. *The Quarterly Journal of Economics*, 114(2), 577–599. <https://doi.org/10.1162/003355399556070>
- Bradbury, J. C., & Crain, W. M. (2001). Legislative organization and government spending: cross-country evidence. *Journal of Public Economics*, 82(3), 309–325. [https://doi.org/10.1016/S0047-2727\(00\)00150-X](https://doi.org/10.1016/S0047-2727(00)00150-X)
- Bradbury, J. C., & Stephenson, E. F. (2003). Local Government Structure and Public Expenditures. *Public Choice*, 115(1/2), 185–198. <https://doi.org/10.1023/A:1022857028836>
- Buchanan, J. M., & Yoon, Y. J. (2002). Universalism through Common Access: An Alternative Model of Distributive Majoritarian Politics. *Political Research Quarterly*, 55(3), 503–519. <https://doi.org/10.1177/106591290205500301>
- Chari, V. V., & Cole, H. L. (1995). A Contribution to the Theory of Pork Barrel Spending. Retrieved January 29, 2022, from <http://minneapolisfed.org/research/sr/sr156.pdf>
- Chattopadhyay, R., & Duflo, E. (2004). Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica*, 72(5), 1409–1443. <https://doi.org/10.1111/j.1468-0262.2004.00539.x>
- Correa, G., & Madeira, R. A. (2014). The Size of Local Legislatures and Women's Political Representation. Evidence from Brazil. Retrieved February 12, 2022, from <https://economia.uniandes.edu.co/sites/default/files/imagenes/eventos/Correa-Madeira2014.pdf>
- Dalenberg, D. R., & Duffy-Deno, K. T. (1991). At-Large versus Ward Elections: Implications for Public Infrastructure. *Public Choice*, 70(3), 335–342. Retrieved February 1, 2022, from <https://www.jstor.org/stable/30025474>
- de Benedetto, M. A. (2018). The effect of council size on municipal expenditures: evidence from Italian municipalities. Retrieved February 11, 2022, from <https://eprints.bbk.ac.uk/id/eprint/26853/1/26853.pdf>
- de Britto, D. G. C., & Fiorin, S. (2016). Corruption and Legislature Size: Evidence from Brazil. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2859940>
- Del Rossi, A. F., & Inman, R. P. (1999). Changing the price of pork: the impact of local cost sharing on legislators' demands for distributive public goods. *Journal of Public Economics*, 71(2), 247–273. [https://doi.org/10.1016/S0047-2727\(98\)00071-1](https://doi.org/10.1016/S0047-2727(98)00071-1)
- de Tocqueville, A. (2010). *Democracy in America: Historical-critical edition of De la démocratie en Amérique* (Bilingual French-English ed.). Liberty Fund. Retrieved

- March 7, 2022, from <https://oll.libertyfund.org/title/schleifer-democracy-in-america-historical-critical-edition-vol-2>
- Drew, J., & Dollery, B. (2017). The Price of Democracy? Political Representation Structure and Per Capita Expenditure in Victorian Local Government. *Urban Affairs Review*, 53(3), 522–538. <https://doi.org/10.1177/1078087416629806>
- Egger, P., & Koethenbueger, M. (2010). Government Spending and Legislative Organization: Quasi-Experimental Evidence from Germany. *American Economic Journal: Applied Economics*, 2(4), 200–212. <https://doi.org/10.1257/app.2.4.200>
- Eggers, A. C., Freier, R., Grembi, V., & Nannicini, T. (2018). Regression Discontinuity Designs Based on Population Thresholds: Pitfalls and Solutions. *American Journal of Political Science*, 62(1), 210–229. <https://doi.org/10.1111/ajps.12332>
- Farnham, P. G. (1990). The impact of citizen influence on local government expenditure. *Public Choice*, 64(3), 201–212. <https://doi.org/10.1007/BF00124366>
- Fiorino, N., & Ricciuti, R. (2007). Legislature size and government spending in Italian regions: Forecasting the effects of a reform. *Public Choice*, 131(1-2), 117–125. <https://doi.org/10.1007/s11127-006-9108-y>
- Freire, D., Mignozzetti, U., Roman, C., & Alptekin, H. (2021). The Effect of Legislature Size on Public Spending: A Meta-Analysis. Retrieved February 11, 2022, from <https://osf.io/download/5ef0453b6598280167cf0e01/>
- Gilligan, T. W., & Matsusaka, J. G. (1995). Deviations from constituent interests: The role of legislative structure and political parties in the States. *Economic Inquiry*, 33(3), 383–401. <https://doi.org/10.1111/j.1465-7295.1995.tb01870.x>
- Gilligan, T. W., & Matsusaka, J. G. (2001). Fiscal Policy, Legislature Size, and Political Parties: Evidence from State and Local Governments in the First Half of the 20th Century. *National Tax Journal*, 54(1), 57–82. Retrieved January 23, 2022, from <https://www.jstor.org/stable/41789534>
- Grembi, V., Nannicini, T., & Troiano, U. (2016). Do Fiscal Rules Matter? *American Economic Journal: Applied Economics*, 8(3), 1–30. <https://doi.org/10.1257/app.20150076>
- Hahn, J., Todd, P., & van der Klaauw, W. (2001). Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design. *Econometrica*, 69(1), 201–209. Retrieved October 31, 2020, from <http://www.jstor.org/stable/2692190>
- Halse, A. H. (2016). More for everyone: The effect of local interests on spending on infrastructure. *European Journal of Political Economy*, 43, 41–56. <https://doi.org/10.1016/j.ejpoleco.2016.02.003>
- Hirota, H., & Yunoue, H. (2012). Local government expenditure and council size: Quasi-experimental evidence from Japan. Retrieved February 11, 2022, from [https://mpra.ub.uni-muenchen.de/42799/1/MPRA\\_paper\\_42799.pdf](https://mpra.ub.uni-muenchen.de/42799/1/MPRA_paper_42799.pdf)



- Höhmnn, D. (2017). The effect of legislature size on public spending: evidence from a regression discontinuity design. *Public Choice*, 173(3-4), 345–367. <https://doi.org/10.1007/s11127-017-0484-2>
- Holzmann, C., & Zaddach, O. (2019). Legend of the Pork Barrel? The Causal Effect of Legislature Size on Public Spending. *FinanzArchiv*, 75(1), 39. <https://doi.org/10.1628/fa-2018-0024>
- Imbens, G. W., & Lemieux, T. (2008). Regression discontinuity designs: A guide to practice. *Journal of Econometrics*, 142(2), 615–635. <https://doi.org/10.1016/j.jeconom.2007.05.001>
- Knight, B. (2004). Parochial interests and the centralized provision of local public goods: evidence from congressional voting on transportation projects. *Journal of Public Economics*, 88(3-4), 845–866. [https://doi.org/10.1016/S0047-2727\(03\)00064-1](https://doi.org/10.1016/S0047-2727(03)00064-1)
- Köglmeier, T. (n.d.). Code-Book zur Datenbank „Kommunalwahlen in Deutschland. 1990-2016.“: DFG-Projekt „Lokale Parteiensysteme in Deutschland“. Retrieved February 14, 2022, from <https://dbk.gesis.org/dbksearch/download.asp?id=63699>
- Kresch, E. P., Schneider, R., Veras de Paiva Fonseca, Henrique, & Walker, M. (2020). Pull Up a Chair: Municipal Council Size and Local Taxes in Brazil. Retrieved January 27, 2022, from <https://cdep.sipa.columbia.edu/sites/default/files/cdep/WP89Kresch.pdf>
- Lee, D. S. (2008). Randomized experiments from non-random selection in U.S. House elections. *Journal of Econometrics*, 142(2), 675–697. <https://doi.org/10.1016/j.jeconom.2007.05.004>
- Lewis, B. D. (2019). Legislature Size, Local Government Expenditure and Taxation, and Public Service Access in Indonesia. *Studies in Comparative International Development*, 54(2), 274–298. <https://doi.org/10.1007/s12116-019-09278-1>
- Lott, J. J. R., & Kenny, L. W. (1999). Did Women’s Suffrage Change the Size and Scope of Government? *Journal of Political Economy*, 107(6), 1163–1198. <https://doi.org/10.1086/250093>
- MacDonald, L. (2008). The impact of government structure on local public expenditures. *Public Choice*, 136(3-4), 457–473. <https://doi.org/10.1007/s11127-008-9308-8>
- Meltzer, A. H., & Richard, S. F. (1981). A Rational Theory of the Size of Government. *Journal of Political Economy*, 89(5), 914–927. <https://doi.org/10.1086/261013>
- Meltzer, A. H., & Richard, S. F. (1983). Tests of a rational theory of the size of government. *Public Choice*, 41(3), 403–418. <https://doi.org/10.1007/BF00141072>
- Milesi-Ferretti, G. M., Perotti, R., & Rostagno, M. (2002). Electoral Systems and Public Spending. *The Quarterly Journal of Economics*, 117(2), 609–657. <https://doi.org/10.1162/003355302753650346>



- Ministry of the Interior of North Rhine-Westphalia. (2020). Kommunalwahlordnung: KWahlO. Retrieved March 15, 2022, from [https://recht.nrw.de/lmi/owa/br\\_bes\\_text?anw\\_nr=2&gld\\_nr=1&ugl\\_nr=1112&bes\\_id=3356&aufgehoben=N&menu=1&sg=](https://recht.nrw.de/lmi/owa/br_bes_text?anw_nr=2&gld_nr=1&ugl_nr=1112&bes_id=3356&aufgehoben=N&menu=1&sg=)
- Mukherjee, B. (2003). Political Parties and the Size of Government in Multiparty Legislatures. *Comparative Political Studies*, 36(6), 699–728. <https://doi.org/10.1177/0010414003254240>
- Naßmacher, H., & Naßmacher, K.-H. (2007). *Kommunalpolitik in Deutschland* (2., völlig überarb. und aktualisierte Aufl.). VS Verlag für Sozialwiss. Retrieved March 15, 2022, from <https://link.springer.com/book/10.1007/978-3-531-90702-4>
- Perotti, R., & Kontopoulos, Y. (2002). Fragmented fiscal policy. *Journal of Public Economics*, 86(2), 191–222. [https://doi.org/10.1016/S0047-2727\(01\)00146-3](https://doi.org/10.1016/S0047-2727(01)00146-3)
- Persson, T., Roland, G., & Tabellini, G. E. (2000). Comparative Politics and Public Finance. *Journal of Political Economy*, 108(6), 1121–1161. <https://doi.org/10.1086/317686>
- Persson, T., & Tabellini, G. E. (1999). The size and scope of government. *European Economic Review*, 43(4-6), 699–735. [https://doi.org/10.1016/S0014-2921\(98\)00131-7](https://doi.org/10.1016/S0014-2921(98)00131-7)
- Persson, T., & Tabellini, G. E. (2004). Constitutional Rules and Fiscal Policy Outcomes. *American Economic Review*, 94(1), 25–45. <https://doi.org/10.1257/000282804322970689>
- Pettersson-Lidbom, P. (2008). Do Parties Matter for Economic Outcomes? A Regression-Discontinuity Approach. *Journal of the European Economic Association*, 6(5), 1037–1056. <https://doi.org/10.1162/JEEA.2008.6.5.1037>
- Pettersson-Lidbom, P. (2012). Does the size of the legislature affect the size of government? Evidence from two natural experiments. *Journal of Public Economics*, 96(3-4), 269–278. <https://doi.org/10.1016/j.jpubeco.2011.07.004>
- Primo, D. M., & Snyder, J. M. (2008). Distributive Politics and the Law of 1/n. *The Journal of Politics*, 70(2), 477–486. <https://doi.org/10.1017/S0022381608080444>
- Rademacher, C. (2018). Lokale Parteiensysteme in Deutschland. <https://doi.org/10.4232/1.12975>
- Roubini, N., & Sachs, J. D. (1989a). Government Spending and Budget Deficits in the Industrial Countries. *Economic Policy*, 4(8), 99. <https://doi.org/10.2307/1344465>
- Roubini, N., & Sachs, J. D. (1989b). Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review*, 33(5), 903–933. [https://doi.org/10.1016/0014-2921\(89\)90002-0](https://doi.org/10.1016/0014-2921(89)90002-0)

- Rudzio, W. (2015). Die Kommunen: Zwischen Verwaltung und Politik. In W. Rudzio (Ed.), *Das politische System der Bundesrepublik Deutschland* (pp. 355–383). Springer Fachmedien Wiesbaden. [https://doi.org/10.1007/978-3-658-06231-6\\_12](https://doi.org/10.1007/978-3-658-06231-6_12)
- Schaltegger, C. A., & Feld, L. P. (2009). Do large cabinets favor large governments? Evidence on the fiscal commons problem for Swiss Cantons. *Journal of Public Economics*, 93(1-2), 35–47. <https://doi.org/10.1016/j.jpubeco.2008.06.003>
- Southwick, L., Jr. (1997). Local Government Spending and At-Large Versus District Representation; Do Wards Result in More "Pork"? *Economics and Politics*, 9(2), 173–203. <https://doi.org/10.1111/1468-0343.00027>
- Svaleryd, H. (2009). Women's representation and public spending. *European Journal of Political Economy*, 25(2), 186–198. <https://doi.org/10.1016/j.ejpoleco.2008.12.004>
- Thistlethwaite, D. L., & Campbell, D. T. (1960). Regression-discontinuity analysis: An alternative to the ex post facto experiment. *Journal of Educational Psychology*, 51(6), 309–317. <https://doi.org/10.1037/h0044319>
- Thornton, M., & Ulrich, M. (1999). Constituency Size and Government Spending. *Public Finance Review*, 27(6), 588–598. <https://doi.org/10.1177/109114219902700602>
- Weingast, B. R., Shepsle, K. A., & Johnsen, C. (1981). The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics. *Journal of Political Economy*, 89(4), 642–664. <https://doi.org/10.1086/260997>

## Appendix

Table 2: Overview of Mechanisms

Political System in General	Political System more specifically	Spending Categories	Municipalities' Characteristics	Councilors' Characteristics
Bureaucrat-council agency problem (Pettersson-Lidbom, 2012)	Absolute council majorities (of certain parties)	Differences between spending categories determined pre- vs. post-election	Which municipalities (by population) drive this effect? (Hirota & Yunoue, 2012)	Gender (e.g. Correa & Madeira, 2014)
Wards vs. at-large elections	Mayors' party affiliation	How are additional expenditures financed, by debt or by taxes? If the latter, which taxes?	Status of cities/municipalities	
Larger councils → more parties → more spending?		More visible and more immediate spending categories? (Egger & Koethenbuerger, 2010)	Ethnicity (Baqir, 2002)	
Strong vs. weak mayoral position				
Lame-duck mayors? Term limits?				
The mechanisms proposed above are restricted to those that were deemed at least remotely testable in the German municipal setting.				