

Motivating Politicians:

The Impacts of Monetary Incentives on Quality and Performance*

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January 2011

Abstract

This paper examines whether higher wages for politicians improve political performance, increase competition for office, and attract higher quality candidates. To identify these effects, we exploit a constitutional amendment that sets non-linear salary caps on the wages of local legislators across Brazil's municipal government. Using this exogenous variation, we show that higher wages increase legislative productivity, resulting in more legislative bills and public goods provision. Higher wages also increase political competition and attract wealthier and more educated candidates. Despite these political entry effects, we show that higher wages increase re-election rates among incumbent politicians.

Key words: politician salary, political selection, political agency.

JEL: D72, D78, J33.

*We thank Daron Acemoglu, Tim Besley, Simon Board, Ken Chay, Ernesto dal Bó, Miguel Foguel, Jinyong Hahn, Ted Miguel, Ben Olken, Torsten Persson, Demian Pouzo, Rodrigo Soares, Duncan Thomas, and seminar participants at Bocconi University, Boston University, Brown University, Duke University, EESP-FGV, EPGE-FGV, Ibmecc-Rio, IPEA-Rio, LACEA-PEG, LSE, MIT, NBER Summer Institute, 2008 NASM of Econometric Society, Pacific Development Conference, PUC-Rio, Stanford GSB, UC-Riverside, UC-Berkeley, Universitat Pompeu Fabra, UC-San Diego, University of Southern California, USP, Warwick University, and Yale University for helpful comments and suggestions. We are grateful to Diana Bello, Nicholas Li, Marcio Nery, Julia Ramos, and Livia Schneider for excellent research assistance, and to Telma Venturelli for providing the legislative census data.

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1 Introduction

Governments that secure property rights, regulate entry less, and curb corruption are thought to create the right incentives for economies to prosper.¹ But while the virtues of good government for economic development and growth are widely acknowledged, what determines the quality of government is much less understood. One predominant view in the literature argues that political institutions that impose constraints on politicians and elites shape the incentives for good policy-making (Besley and Case (1995), Persson, Roland, and Tabellini (1997)). However, variation in political institutions across countries can only partially explain the variation in the quality of government.²

A complementary view is that the quality of policy-making depends on political selection – the competency, honesty, and motivation of politicians.³ Recent empirical evidence suggests that leaders play an important role in enacting the right policies and affecting economic performance (Besley, Persson, and Sturm 2010; Jones and Olken 2005). Thus, it is important to understand what attracts and keeps high quality politicians in office and what provides them with the incentives to perform according to voters’ preferences.

This paper examines whether salaries of local politicians of Brazil’s municipal governments affect legislative performance, political competition, and the types of politicians that run for office. To identify these effects, we overcome two obstacles that have limited the existing literature. First, we gather data on all candidates that ran for legislative office in Brazil’s local elections. With these data, we are able to estimate the effects of wages on not only the number of candidates but also on their characteristics (e.g. schooling, profession, wealth). Previous studies have been unable to address questions related to entry into politics due to the lack of information on all political candidates.⁴ Instead, they have had to focus on the effects of wages on the behavior and selection of

¹See Acemoglu, Johnson, and Robinson (2001), De Long and Schleifer (2003); Knack and Keefer (1995); North (1981).

²In their account of the success story of Botswana, Acemoglu, Johnson, and Robinson (2003) conjecture that good institutions played an important role in Botswana’s performance. Nevertheless, they also attribute a key role to “a number of important and farsighted decisions by the post-independence political leaders, in particular Seretse Khama and Quett Masire”.

³See for example Besley (2006) and Acemoglu, Egorov, and Sonin (2010).

⁴See for example Besley (2004) and Diermeier, Keane, and Merlo (2005). One notable exception is a recent paper by Gagliarducci and Nannicini (2009), who examine the effects of higher wages on the pool of candidates that run for

elected politicians. But this is potentially an important limitation if higher wages increase political competition and attract higher quality candidates, which in turn affect the behavior of elected politicians.

Second, wages are not set randomly but often by the politicians themselves. This introduces several identification concerns because politicians that perform better may be able to set higher wages (Di Tella and Fisman 2004). We address this identification issue by exploiting a quasi-experimental source of variation in local legislators' salaries across Brazil. A 2000 constitutional amendment introduced a cap on the maximum salary that could be paid to local legislators. This cap, which varies according to the municipality's population, induces discontinuities in wages across municipalities. We use these discontinuities to estimate the causal effects of salaries on political performance and selection using a two-stage least squares estimator motivated by Angrist and Lavy (1999).

Our findings show that higher salaries improve politicians' performance in office. We find that higher wages increase both the number of bills submitted by the legislators and those approved. For instance, a 20 percent increase in wages increases the number of bills submitted by 25 percent. We also find evidence that higher salaries have a modest effect on the provision of some public goods, particularly in the areas of education and health. Overall, these results suggest that higher wages are likely to make incumbent politicians more accountable due to the increase in the value of holding office. Politicians respond with more legislative effort in order to boost their chances of re-election. Thus, our findings complement a large body of work related to political agency models that focuses on the role of electoral accountability in disciplining incumbent politicians.⁵

But higher salaries also attract better candidates. In municipalities that offer higher wages, local legislators are more educated and have more experience. These effects, however, are relatively modest. A 20 percent increase in wages only leads to a 0.2 increase in the average years of schooling and a 0.05 increase in the number of terms of experience. These results, however, do lend further empirical support for the citizen-candidate models of Besley and Coate (1997) and Osborne and mayor in Italy. Using a similar research design, they also find that higher wages attract more educated candidates.

⁵See Barro (1970) and Ferejohn (1986) for original work focusing exclusively on hidden actions. More recently, Besley (2006) and Smart and Sturm (2006) build models with both unobserved types and actions. Empirical evidence is provided by Besley and Case (1995) and Ferraz and Finan (2010).

Slivinski (1996), which highlight the importance of endogenous entry into politics.⁶ Our findings are also related with the predictions of Caselli and Morelli (2004), which uses a citizen-candidate model to show that the competence of the elected body is increasing in the political rewards from office.

That our findings are consistent with two different classes of political economy models highlights the importance of capturing the incentives of both the elected politician as well as that of the entrant when trying to understand the effects of wages on the political process. Thus, while political agency models predict that higher wages will lead to higher re-election rates as politicians exert more effort, these models ignore the entry effects that distinguish the citizen-candidate models, which may even decrease re-election rates. Taking these theoretical implications to the data, we find that on net higher wages increase re-election rates among incumbent politicians, even though higher salaries result in more political competition, and a more educated, experienced, and wealthier pool of candidates.

The rest of the paper is organized as follows. Section 2 provides a theoretical framework that will help the interpretation of our empirical findings. Section 3 provides the institutional background and describes the data used for the analysis. Section 4 presents the empirical strategy, followed by the results shown in section 5 and the conclusions in section 6.

2 Theoretical Framework

In this section, we present a simple political economy model to help interpret some of our main empirical findings. Our model highlights the principal tradeoffs local legislators face in allocating time (effort) between legislative activities and work in the private sector. We then provide some comparative statics for how wages affect the effort level of legislators and their re-election chances.

⁶See Chattopadhyay and Dufflo (2004), Lee, Moretti, and Butler (2004), and Munshi and Rosenzweig (2008) for empirical evidence in support of these models.

Basic Model

Consider an infinite-horizon economy in discrete time with a finite number of citizens, who are heterogenous in their ability θ , where $\theta \sim F(\mu, \sigma_\theta)$. All citizens have the same preferences given by

$$E_0 \sum_{t=0}^{\infty} \beta^t u(c_t, G_t)$$

where $\beta \in (0, 1)$ represents the common discount factor, and $u(\cdot)$ is a continuously differentiable function increasing in both private consumption, $c_t \geq 0$, and public goods, $G_t \geq 0$.

At time t , which denotes a political term, a set of citizens in this economy are legislators and both their ability θ and legislative efforts (measured in hours) e_t^L determine the level of public goods. Specifically, the production technology is given by

$$G_t = g(e_t^L, \theta)$$

where $g(\cdot)$ is assumed to be increasing and continuously differentiable. We assumed that local public goods are financed from transfers by the federal government.⁷

In addition to engaging in legislative activities, legislators can also work part-time in the private sector and earn an hourly wage of $w^m(\theta) \geq 0$, which is increasing in θ , i.e. $w^m(\theta_i) > w^m(\theta_j)$ for $\theta_i > \theta_j$.⁸ Thus, given a total labor supply of \bar{L} hours, which is supplied inelastically, a legislator must decide how much time to allocate between legislating, $e_t^L > 0$, versus private sector work, $e_t^M \geq 0$, taking into account the future returns of each activity.⁹ Although legislators receive a fixed salary w^L independent of additional effort, their probability of re-election π_t is a function of the amount of public goods that they provide. In particular, we assume that the probability of re-election is determined by

$$\pi_t = f(G_t, N^*(w^L)) + \varepsilon_t \tag{1}$$

⁷On average, more than 85 percent of a municipality's budget comes from federal transfers.

⁸According to data from a survey conducted by *Interlegis*, 98 percent of legislators have an outside job.

⁹We assume legislators have to exert some effort into legislating, i.e. $e_t^L > 0$, to guarantee that not everyone in the economy will enter politics. Thus, there will exist some θ high enough such that he will prefer to stay in the private sector and exert all of his time earning a market wage.

where N^* captures the number of candidates that given a wage w^L decide to run for election at the end of the term based on the following participation constraint:

$$V_{\theta}^O(w^L, w^m, N^*) = \max\{V_{\theta}^L(w^L, w^m, N^*), u(w^m \bar{L}, G(\bar{\theta})) + \beta V_{\theta}^O(w^L, w^m, N^*)\} \quad (2)$$

where $V_{\theta}^L(w^L, w^m, N^*)$ is the value of being a legislator of type θ at a given wages $\{w^m, w^L\}$, and $V_{\theta}^O(w^L, w^m, N^*)$ is the value associated with the option of running for election in the next period.¹⁰ $N^* = \int 1\{V_{\theta}^O(w^L, w^m, N^*) = V_{\theta}^L(w^L, w^m, N^*)\}dF(\theta)$ determines the number of candidates that run for election in equilibrium and $G(\bar{\theta})$ denotes the expected level of public goods provision given the ability level of the candidate pool, i.e. $G(\bar{\theta}) = \int_{\theta < \theta^*(w^L)} H(g(e(\theta), \theta))dF(\theta)$.

Because the opportunity cost of entering politics and the value function of being a legislature are both (weakly) increasing in ability, based on equation 2, if an individual of type $\hat{\theta}$ is willing to participate in politics then every individual of ability $\theta \leq \hat{\theta}$ is also willing to enter into politics. Given this setup, an increase in wages w^L will then weakly increase the size and quality of the candidate pool.¹¹

Thus in specifying equation 1, we capture in reduced-form the possibility that higher wages will attract potentially more and higher quality candidates to run for election, which may then lower the re-election probabilities of incumbent legislators. Moreover, we assume that incumbents have correct expectations about the number of candidates that will enter the race conditional on the salary offered, but also face some uncertainty from a general popularity shock, ε_t .

The timing of the events is as follows. At the beginning of a term t , each legislator decides, simultaneously and non-cooperatively, how much effort to exert in public goods provision. At the end of the period, individuals decide to enter the election and legislators run for re-election. Voters then observe the level of public goods provided by each legislator and then cast their votes. If the

¹⁰We assume that running for election is costless. Moreover, with no individual-specific uncertainty in the model, an individual of type θ who prefers to stay in the private sector at time t , will continue in the private sector for all future periods.

¹¹To see this, note that both V_{θ}^L and $u(\cdot)$ are increasing in ability. Because the max of two increasing functions is also increasing, V_{θ}^O is increasing in θ . Assuming that there exists some type θ high enough who would prefer to spend all his time in the private sector, it then must be the case that V_{θ}^L and V_{θ}^O will intersect at a single point. Thus an increase in w^L , which will shift out the V_{θ}^L , will lead to an increase in the size and quality of the candidate pool.

legislator loses then he works strictly in the private sector and does not return to the public sector, otherwise he is re-elected.

Given the timing of events, we can describe formally the decision process of an incumbent legislator who chooses effort level, e_t^L , to maximize the following infinite horizon Markov decision process:

$$V_\theta^L(w^L, w^m, N^*) = \max_{e_t^L} \{u(c_t, G_t) + \beta(\pi_t V_\theta^L(w^L, w^m, N^*) + (1 - \pi_t)V_\theta^M)\}$$

where V_θ^M denotes the value associated with strictly working in the private sector. Given this Bellman equation, the first-order condition for the optimal effort level (assuming an interior solution) is given by:

$$u_c \frac{dc_t}{de_t^L} + u_G \frac{dg}{de_t^L} + \beta \frac{df}{de_t^L} [V^L - V^M] = 0$$

We can then totally differentiate this expression to see how an increase in legislators' wages will affect optimal effort. Under the assumption that private and public consumption are additive, we get the following expression for the effects of wages on effort:

$$\frac{de_t^L}{dw^L} = \frac{\beta \left[V^L \frac{\partial^2 f}{\partial e_t^L \partial N^*} \frac{dN^*}{dw^L} + \frac{df}{de_t^L} \frac{dV^L}{dw^L} \right]}{\frac{\partial^2 u}{\partial c_t^2} \left(\frac{dc}{de_t^L} \right)^2 + u_c \frac{\partial^2 u}{(\partial e_t^L)^2} + \frac{\partial^2 u}{\partial G_t^2} \left(\frac{dg}{de_t^L} \right)^2 + u_G \frac{\partial^2 g}{(\partial e_t^L)^2} + \beta V^L \frac{\partial^2 f}{(\partial e_t^L)^2}} \quad (3)$$

From equation 3, we see that if the returns to effort are independent of the number of candidates that enter the election, i.e. $\frac{\partial^2 f}{\partial e_t^L \partial N^*} = 0$, then effort level is increasing in wages, otherwise the effects can be ambiguous.

Moreover, by substituting the optimal level of effort into equation 1 and differentiating with respect to wages, we also see that the effects of wages on re-election rates are also ambiguous. Even if higher wages increase the level of effort and thus increases re-election chances, if wages also attract higher quality candidates, i.e. $\frac{dN^*}{dw^L} > 0$, then depending on which effect dominates, re-election rates among incumbent politicians may not necessarily increase.

Figure A1 further illustrates the model for a given set of parameters and functional form as-

sumptions.¹² Panel A depicts the optimal level of effort (measured in the number of hours per month) devoted towards legislative activities. As wages and consequently the value of holding office increase, legislators spend more time on submitting bills and petitions (see panel A).¹³ However, this increase in effort does not necessarily lead to higher re-election rates. Although higher wages induce more effort, as we depict in panel B they also attract better candidates to politics.¹⁴ Thus as depicted in panel C, depending on which effect dominates higher wages may not lead to higher re-election rates among incumbent politicians.

In sum, this simple model predicts that while higher wages may induce more effort, the effects on incumbent re-election rates are ambiguous. Whether the data support these theoretical predictions has yet to be documented, which is the main contribution of this paper.

3 Institutional Background and Data

Brazil is one of the most decentralized countries in the world. Local governments receive large sums of resources to provide public services such as education, health care, transportation, and local infrastructure.¹⁵ The decision on how to spend these resources is made by an elected mayor in conjunction with a local council of elected legislators – the *Câmara de Vereadores*. In this section, we discuss how Brazil’s local legislators influence local public spending.

¹²The figure shows the equilibrium outcomes under the following functional form assumptions. Politician’s utility: $u(c_t, G_t) = \frac{c_t^{1-\alpha}}{1-\alpha} + \psi \ln(G_t)$. Production function: $G_t = (e_t^L)^\eta$. Probability function: $\pi_t = \Phi(\gamma_1 G_t - \gamma_2 w_t^L)$. The parameter values: $\beta = 0.9$, $\alpha = 0.2$, $\psi = 0.2$, $\eta = 0.3$

¹³This result is consistent with the political agency model described in Besley (2004). He shows that given the possibility of re-election, as the value of holding office increases, dissonant politicians are much more likely to refrain from rent-seeking and behave according to voters’ preferences. Hence, this model predicts that an increase in the remuneration increases average politician’s performance.

¹⁴This result is similar to Caselli and Morelli (2004). They show using a citizen-candidate model that higher wages will attract better candidates. In a related paper, Messner and Polborn (2004) also use a citizen-candidate framework to analyze the effect of remuneration on political entry. Their model generates, however, a different comparative static result. The expected quality of candidates may decrease as the benefits of holding office increase. With higher wages, more individuals enter politics thus increasing the incentive for more-competent candidates to free-ride on the other candidates and thus not run for office.

¹⁵5,565 Brazilian municipalities receive on average \$35 billion per year from the federal government, which represents approximately 15 percent of federal government’s revenue.

3.1 Local Governments and the *Câmara de Vereadores*

In most municipalities, being a legislator is not full-time work. Based on a survey of 1,934 legislators interviewed in 407 municipalities in 2005, 98 percent had another professional activity. Among those, 20 percent had another public sector job while the rest worked in the private sector. Combining their legislative activity with outside work is not difficult given that in most municipalities, legislators are only required to be in the council on average four days per month. In fact, 44 percent of the legislators reported working only up to four hours per day on activities related to the local council.¹⁶ Interestingly, this pattern of dual employment is common in many other countries such as Italy, France, Germany, and the UK, where even at the federal level elected members of parliament continue to work in the private sector. For instance, Gagliarducci, Nannicini, and Naticchioni (2010) have documented that a large share of Italian politicians maintain their jobs in the private sector even after being elected. They also show that politicians with higher outside incomes are much less productive in the parliament. As we discuss in Section 5, our findings can be interpreted in a similar manner. Because legislators are not engaged full-time in public sector work, they have an incentive to exert more effort towards legislating and public goods provision when legislators' salaries are higher.

Legislators can influence local spending and the quality of public policy in three ways. First, legislators must approve the municipal budget. The legislature receives a detailed budget proposal from the mayor with spending items on all programs and public work projects. It analyzes the budget proposal, which is then returned to the mayor with or without line-items vetoes.¹⁷ While mayors are not obligated to spend on all of the approved items, the budget limits the amount that can be spent on each item.¹⁸

Local legislators also influence local policy-making mainly by submitting bills and requests for public works. Bills consist of formal projects that are submitted to the legislature for consideration

¹⁶These figures are based on a questionnaire conducted by *Interlegis*. This questionnaire was conducted in a random subset of municipalities in four states. A total of 2,140 legislators were interviewed in 407 municipalities. They were asked questions regarding their background, motivation to enter politics, knowledge of politicians and laws, etc.

¹⁷See Pereira and Mueller (2002) for an analysis of the budget process and the executive-legislative relations in Brazil.

¹⁸Differently from the federal congress, however, amendments play a small role in the bargaining process between the local executive and legislative (Melo 2005). See Ames (1995) for a detailed description on the use of *Emendas Parlamentares* in Brazil.

to become municipal laws. They can be submitted by individual legislators, a legislative committee, or the mayor himself. While most bills submitted by mayors focus on obtaining funds for extra spending and the hiring of public employees, bills formulated by legislators focus on the adoption of new programs or the creation of local councils to monitor the executive for its implementation of social programs.

Some examples will help to illustrate the use of these bills. In the municipality of Brumado, Bahia, the legislator Gilberto Dias Lima, elected in 2004, proposed two bills that directly affect the quality of education and health provided. The first project established direct elections for municipal school principals and a second project requires municipal health clinics to test newborns for hearing difficulties. Bills are also used to establish new social programs. Rosinere França Abbud, a legislator from Juiz de Fora, Minas Gerais, presented a bill aimed at creating an emergency unemployment program. In Santa Cruz do Capibaribe, Pernambuco, legislator Rui José Medeiros Silva proposed a bill to create a municipal council of economic and social development.

On the other hand, requests for public works consist of explicit requests made by legislators to the mayor, for geographically-targeted public works and services. They usually consist of infrastructure projects such as road building, construction of health clinics and schools. But, it is also common to see legislators request items such as additional doctors in local clinics or teachers and computers for schools. For instance, in the municipality of São Manuel, São Paulo, a legislator sent a request to the mayor to build a primary school in the neighborhood of Conquista e Bela Vista. In Itabela, Bahia, the legislator Genilda Farias requested resources to train primary school teachers, while another legislator, Agnaldo Santos, proposed the hiring of doctors to attend the growing number of patients at the Itabela health center. In the municipality of Taquari, Rio Grande do Sul, petition no.140/06, from legislator Celso Göethel, asked for the acquisition of computers for the municipal school “Sóror Joana Angélica”, located in Passo do Juncal.

In addition to submitting bills and public work requests, local legislators are also in charge of monitoring the executive for its use of public resources. The quality of the legislative body (competence and honesty) can affect corruption levels, irregular public hires, and irregularities in

the public administration.¹⁹

The returns to these legislative activities can be quite high particularly in a political environment where re-election rates are low. Unlike mayors who face a two-term limit, legislators can be re-elected indefinitely every 4 years based on an open list, proportional representation system. Moreover, for some politicians, the local legislature is just a first step towards a higher level political position. A large number of mayors, governors and congressmen started their careers as local legislators. Hence, politicians that desire a career in politics have strong incentives to perform according to voters' expectations. Given these career concerns and low re-election rates, an increase in salaries may induce legislators to put more effort into signaling their productivity in hopes of re-election and building a future career.

We measure this effort by examining the number of bills submitted and approved by legislators and the supply of public services in the areas of education, health, and sanitation. In order to illustrate how legislators inform voters about the bills and requests submitted, we present in Appendix B three examples extracted from the personal web sites of legislators. Each example includes the name of the legislator and the municipality, and the internet address of the web site that provides information on their accomplishments.

3.2 Constitutional Rules and the Salary of Legislators

The salary of federal deputies, as determined by Brazil's constitution, serves as the basis for the wages of all other legislators. State legislators are free to set their own salary subject to a maximum of 75 percent of what federal deputies earn and until 2000 local legislators were subject to a maximum salary of 75 percent of state deputies' earnings. In February of 2000, a constitutional amendment was established to further limit the maximum salary of local legislators. It defined caps on the salary of legislators and the share of revenues that could be spent on the local legislature as a function of municipal population.

Table 1 summarizes the main features of this law. There are 5 population thresholds defining the maximum salary of legislators. In smaller municipalities, up to 10,000 inhabitants, local legislators

¹⁹See Lopez (2004) for a detailed case study of the executive-legislative relation at the municipal level.

can get as much as 20 percent of the state deputy salary. This share increases to 30 percent in municipalities with a population between 10,000 and 50,000 residents. For larger municipalities, those above 500,000 inhabitants, the maximum value is set at 75 percent of state deputy salaries. Column 3 displays the maximum allowed wages estimated for 2004/2005, given that federal deputies had a salary of R\$12,847.2 and state deputies had a salary capped at R\$9,635.4.²⁰ For municipalities with less than 10,000 inhabitants, the maximum salary of a legislature can receive is R\$1,927 per month versus R\$7,227 per month for legislators residing in municipalities with a population above 500,000 inhabitants. The constitutional amendment also capped the amount of legislative spending as a percent of total revenues, but these percentages only vary for the municipalities with a population above 100,000, which represents only 3 percent of the sample (see column 4).

Because wages can only be set by legislators for the subsequent administration, these new caps did not have an immediate effect on salaries during the 2001-2004 legislature, except for a small subset of municipalities that had to reduce wages to comply with the law. Even though wages are set in the previous legislature, as it will become clear in the empirical strategy section, this does not affect our research design. Our identification strategy, which is an *intention-to-treat* design, exploits cross-sectional variation and the discontinuous jumps created by the amendment. This does not suggest, however, that the law did not affect politicians' performance during the 2001-2004 term. It is possible that among municipalities that were able to offer a higher future wage, incumbent politicians increased effort in order to get re-elected.²¹

Given that salaries are determined by these population cutoffs, there are two potential concerns that might affect our analysis. First, municipal governments may have influenced the law through some bargaining process with the federal government or may have altered their population count. This is extremely unlikely in the case of Brazil, where municipal governments (even larger ones) have limited control over the constitutional amendments that are legislated. Also, we can indirectly test for this when comparing the characteristics of municipalities near the threshold points. A second concern relates to the existence of other policies that are determined by population cutoffs. As

²⁰There is almost no variation in the salaries of state deputies across Brazil. Most of the variation comes from the perks from office.

²¹Because our data on wages and legislative performance is collected for 2005, we are unfortunately unable to test this hypothesis.

we discuss in detail in the robustness section, these population cutoffs do not determine any other policies and our results are robust to accounting for policies that are affected by other population thresholds.

3.3 Data and Descriptive Statistics

The main data source used in this study comes from a new Census of Brazil’s Municipal Councils. It was collected at the end of 2005 by a sub-secretary of the Brazilian Senate (*Interlegis*), for approximately 5,000 municipalities. Roughly, 260 surveyors collected data on physical facilities (e.g. building ownership, existence of telephone lines, and access to the internet); institutional characteristics (e.g. administrative structure, existence of legislative commissions, wage paid to legislators); and characteristics of legislators (e.g. education, gender, age, term in office). A novel feature of this census is the availability of municipal level data on the legislators’ wages, and measures of legislative output (number of bills submitted and approved).²²

To study the effects of wages on political entry and selection, we construct a complementary dataset with the characteristics of legislative candidates that ran in the 2004 and 2008 elections. Using the electronic files available from the Tribunal Superior Eleitoral (TSE), we calculate for each municipality, the number of candidates, the proportion of female candidates, their age, their years of schooling, occupation, campaign spending, and their political parties. For 2008, we also have a candidate’s self-reported level of wealth.

Finally, we are interested in how variation in salaries affects effort and reelection. Hence, we use the microdata from the Tribunal Superior Eleitoral (TSE) to build a measure of the share of incumbent legislators that run for reelection and the share of legislators that get reelected. In order to do this, we match the names of incumbent legislators in 2000 and 2004 to the candidates in 2004 and 2008, respectively.

For the purpose of the analysis, it is important to account for any differences in municipal characteristics and to test whether these characteristics are discontinuous at the wage cutoffs. For

²²We also have data on total compensation (wages plus perks from office such as gas for their cars and mobile phones) but there is considerable measurement error associated with these figures. We use wages in the analysis that follows but our results are similar if instead we use total compensation.

this purpose, we gathered information from several additional sources.²³ The Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística (IBGE)) 2000 population census provides us with socio-economic characteristics such as the percentage of urban population, Gini coefficient, income per capita and a measure of infrastructure availability (percentage of households with electricity). In addition, we use the IBGE inter-census population estimates to obtain data on the 2003 and 2004 municipal populations. To control for different institutional features of the municipality, we use the 2002 and 2005 *Perfil dos Municípios Brasileiros: Gestão Pública*. This survey characterizes various aspects of the public administration, such as budgetary and planning procedures and the number of public employees. It also provides us with structural features such as the existence of local radio and the presence of a judge and public prosecutors. Public finance data was obtained from the National Treasury through the FINBRA dataset. It contains municipal spending by categories and revenues by sources (i.e. local taxes, intergovernmental transfers). The differences in legislators' wages across municipalities might, in part, reflect differences in living costs across regions. In order to control for this we also gathered data on average municipal wages from the RAIS, which includes information on all workers in the public sector and formal private sector.

Descriptive statistics for the main variables used in the analysis are shown in Table 2. The average size of the legislature is about 9 legislators (which is equal to the minimum size) and the average wage for a legislator is R\$1707 per month, which is approximately 2.6 times the average wage in the municipality. For most municipalities, the legislature is in session for only part of the week – less than 12 hours – which again attests to the fact that being a legislator is not a full-time activity. Despite this, during 2005, there were approximately 1.11 bills submitted per legislator and 0.80 were approved. The legislatures are mainly composed of male legislators (approximately 87 percent) and the average years of schooling is 9.84 (median is 9.89), which is equivalent to a high school dropout. Re-election rates are relatively low among local legislators, with only 40 percent getting re-elected in 2008 elections. Even when we condition on those that ran, re-election rates are only slightly above 53 percent. There are, on average, 5.2 new candidates per seat (excluding incumbents), but this number drops to 2.67 for the first quartile of municipalities. As

²³See the data appendix A for a detailed description of data sources.

for municipalities in Brazil, they are, on average, small (26,200 inhabitants), largely urban (60 percent of urban population), highly unequal (average Gini coefficient of 0.56), and approximately a quarter of the population is illiterate.

4 Empirical Strategy

Our analysis examines the effects of wages on the performance of incumbent politicians and the types of individuals that enter politics. To identify these effects, we exploit exogenous variation in local legislators' salaries induced by federally-mandated salary caps. We begin this section by discussing the identification concerns associated with using OLS estimation. We then present the econometric models we use to estimate these wage effects and the assumptions needed for a causal interpretation of the parameters of interest.

Consider the following cross-sectional relationship between wages and politicians' performance (or characteristics):

$$\begin{aligned} y_i &= \beta_0 + \beta_1 w_i + x_i' \delta + \varepsilon_i \\ w_i &= \alpha + x_i' \theta + \nu_i \end{aligned} \tag{4}$$

where y_i is the average performance of politicians in municipality i (e.g. the average number of projects approved by the legislative council), w_i is the wage that legislators receive, x_i is a vector of observed municipal characteristics, and ε_i and ν_i are unobserved determinants of politician performance and wages, respectively. Under the assumption that $E[\varepsilon_i \nu_i] = 0$, the least squares estimator of β_1 will be a consistent estimate of the causal effect of wages on politician performance (or selection).

Unfortunately, there are several potential omitted factors in equation 4 that covary with both wages and politician performance. Municipalities that offer higher wages presumably attract politicians who are also more educated and perhaps more productive in submitting bills to the legislature. Moreover, the correlation between wages and politician performance might capture the fact that higher performing politicians might be able to set themselves a higher wage (Di Tella and Fisman

(2004)).

To overcome these identification concerns, we exploit the exogenous variation in legislators' wages induced by salary caps. As we discussed in Section 3, the federal government stipulated five ceilings for the wage of local politicians depending on municipal population thresholds. In municipalities with populations above the cutoffs, legislators receive, on average, higher salaries compared to those legislators in municipalities below the cutoffs.²⁴

Our main empirical approach, which is similar to Angrist and Lavy (1999), exploits the fact that wages are in part determined by a discontinuous function of the municipality's population. If legislators' salaries are smoothly related to other characteristics at the population cutoffs, then we can estimate the effects of wages on performance and political selection using the discontinuous jumps in wages that were created from the law.

Let the function f_i^{cap} denote the maximum wage a legislator in municipality i can receive, specifically,

$$\begin{aligned} f_i^{cap} &= 1927.1 \times 1\{P_i \leq 10,000\} + 2890.6 \times 1\{P_i \in (10,000, 50,000]\} \\ &+ 3854.2 \times 1\{P_i \in (50,000, 100,000]\} + 4817.7 \times 1\{P_i \in (100,000, 300,000]\} \\ &+ 5781.2 \times 1\{P_i \in (300,000, 500,000]\} + 7226.6 \times 1\{P_i > 500,000\} \end{aligned}$$

where P_i denotes the population of municipality i . We estimate the following TSLS model:

$$\begin{aligned} y_i &= \beta_0 + \beta_1 w_i + g(P_i) + x_i' \delta + \varepsilon_i \\ w_i &= \alpha_0 + \alpha_1 f_i^{cap} + g(P_i) + x_i' \theta + \nu_i \end{aligned} \tag{5}$$

where the function $g(\cdot)$ is a flexible function of population.

In equation 5, consistent estimation of β_1 using the TSLS approach relies on wages being discontinuous at the cutoffs (which is testable) and $g(\cdot)$ being locally continuous at the population

²⁴The population cutoffs act as a cap on the maximum value that can be paid to legislators, but the amount that is effectively paid, depends on the resources available to the municipal government, on political bargaining between the mayor and legislators, and on the social pressure exerted by the population. Thus, as we will later see, a large number of smaller municipalities pay salaries below the cap.

cutoffs. If the function $g(\cdot)$ is specified correctly, it will capture all other potential effects of population on wages and legislators outcomes far away from the discrete jumps. Then, the use of the step function as an excluded instrument will provide a consistent estimate of β_1 . Conditional on the validity of the instrument, β_1 will then capture the local average treatment effect of wages on political performance and selection. For our main specifications, we specify $g(P_i)$ as third-order polynomials with a quadratic spline at the first population threshold. This functional form assumption fits the data quite well, and it does not appear to be overly restrictive as our results are robust to a series of alternative functional form assumptions.

Even though our preferred specification uses the salary caps as a single instrument, as a further test of robustness we also present estimates from a fuzzy regression discontinuity model where the five population cutoffs serve as excluded instruments in a two-stage least squares setting (Van Der Klaauw 2002). While the identification assumptions are similar to the previous approach, this framework puts greater weight on the variation near the points of the discontinuities. In this case, we estimate the following model:

$$\begin{aligned} y_i &= \beta_0 + \beta_1 w_i + g(P_i) + x_i' \delta + \varepsilon_i \\ w_i &= \alpha_0 + \sum_{k=1}^5 \alpha_k 1\{P_i > \bar{P}_k\} + g(P_i) + x_i' \theta + \nu_i \end{aligned} \tag{6}$$

where $1\{\cdot\}$ is an indicator function that equals one if the municipality's population is above the k^{th} cutoff \bar{P}_k (i.e. 10,000 inhabitants), and the function $g(\cdot)$ is again a flexible function of population. Under similar identification assumptions, using the population cutoffs as excluded instruments will provide a consistent estimate of β_1 .

5 Empirical Results

In this section, we begin by documenting the association between legislator's salaries and our various measures of political performance. We then use our identification strategy based on the federally-mandated salary caps to estimate the causal effects of wages on political performance and show that higher salaries lead to an increase in legislative productivity. We then investigate whether

this increase is due to the incentives induced by higher wages or a better selection of politicians entering office. Finally, we show that higher wages lead to higher re-election rates among incumbent politicians despite the fact that higher wages also induce more political competition. Overall, the results are robust to various specifications and are consistent with the models of Caselli and Morelli (2004) and Besley (2004).

5.1 The Effects of Wages on Political Performance

OLS Estimates

Table 3 presents estimates for the effects of wages on various measures of legislative performance and public good provision for the 2005-2008 municipal legislature. The first row reports the estimated coefficient on wages from a series of OLS regressions where the dependent variables are specified in each column. Each specification adjusts for variation in the legislative inputs that can potentially affect performance (e.g. the number of assistants per legislator and the number of hours for which the legislature functions per week) as well as characteristics of the municipality such as, population, income per capita, and urbanization. The regressions also control for private sector wages in the municipality to capture any potential differences in politician's productivity that might be due to differences in politicians' opportunity costs across municipalities.

In column 1, we report a strong positive association between wages and the number of projects submitted per legislator. The point estimate on wages suggests that a 20 percent increase in salaries is associated with a 15 percent increase in the number of bills submitted. Higher wages are also associated with more approved projects per legislator (column 2). In addition to legislative bills, we use two other measures of the legislative process that capture organizational efficiency and legislative activity: an indicator for the existence of a functioning commission and an indicator for whether the legislature promotes public events to discuss new projects. Several scholars argue that in legislatures, the existence of committees and public hearings reduce the possibility of opportunistic behavior by legislators (Weingast and Marshall 1988). Even though most municipalities only have one or two committees, their existence might induce gains from specialization and improvements in the quality of decision-making. In columns 4 and 5, we see that higher wages are associated both

with a functioning commission and with the existence of public hearings.

As described in the Section 3, legislators affect policy both through formal bills as well as petitions. These petitions are a common way for legislators to provide patronage to their constituents and consist of various types of public works (as depicted in Appendix B). Unfortunately without data on the number and type petitions, we cannot test whether wages affect the number of petitions that legislators submit. Instead, we examine the relationship between salaries and the provision of public goods and services that are most frequently cited in these petitions – schools, local clinics and sanitation infrastructure.²⁵ In columns 5-11, we also find that municipalities that offer higher wages also provide more public goods in the areas of education and health. However, for sanitation there is a negative relationship between wages and the share the population with sanitation connections.

The remaining rows of Table 3 display the associations between performance and other local characteristics. Political performance improves with income per capita and urbanization. This might reflect a better capacity to monitor politicians and hold them to account. And not surprisingly, legislatures that are open longer or have more assistants also tend to produce more bills and projects.

Overall, the results presented in Table 3 suggest that higher remuneration is associated with increased political performance. One should, however, be cautious to interpret these results as causal. As we discussed previously, reverse causation is important concern. Because legislators can set their own pay, more productive legislatures might be more able to convince the mayor and the population to set higher wages. Moreover, there are several omitted factors such as the ability of legislators that could confound these results. We address these identification concerns using exogenous variation from the salary caps.

²⁵If bills and petitions are viewed as substitutes then it is quite possible that higher wages may have even lowered the number petitions. Using data for 148 legislators on the number of petitions and bills that were submitted in 2005-2007 by legislator for a sample of 14 municipalities, we estimate a positive correlation coefficient of 0.151 (bootstrap standard error=0.083). Unfortunately this is not based on a random sample of municipalities. We could only gather this information for a subset of the municipalities that posted this information on the legislatures' websites.

Population Thresholds and Politicians' Salaries

The innovation of our empirical approach is to use this exogenous variation in wage determination to identify the effects of wages on politician performance and selection. The effects of the federal mandate on politicians' wages can be seen in Figure 1, which plots politicians' wages in 2005 against the municipality's population in 2003.²⁶

The data exhibit a clear step function corresponding to the population thresholds (denoted by the vertical lines). For instance, municipalities between 50,000 and 100,000 inhabitants (i.e. the third segment) display a cluster of wages set at around R\$ 4,000 per month, whereas in the fourth segment, the wages appear to cluster at just below R\$5,000. The figure also highlights the fact that several municipalities do not set their politicians' wages to the maximum allowance.

The general patterns presented in the figure are also borne out in the adjusted regression results. In Table 4, column 1 presents the first-stage regression of wages on indicators for whether the municipality's population is above a particular cutoff. The coefficients on the cutoff indicators estimate the average increase in wages at each threshold point, while controlling for a series of legislative and municipal characteristics including population. For instance, the indicator for the first cutoff suggests that wages in municipalities just above the population threshold pay politicians 300 R\$ more than municipalities immediately below the cutoffs, which represents approximately a 25 percent increase. The point estimates increase for the other cutoffs, but after the second cutoff, we cannot distinguish between the estimates statistically, except for the last cutoff (e.g. F-test for equality between 2 and 5 cutoff =3.6; p-value=0.06). In column 2, we re-estimate the first stage regression allowing for a piecewise linear spline in population. The estimates display a similar pattern to the ones presented in column 1, except for the second cutoff where the point estimate is smaller but still statistically and economically meaningful. Overall, the effects of the cutoffs are quite important with a joint F-statistic of 47 on the excluded instruments. In column 3, we re-estimate the specification presented in column 2, but use instead the federally mandated salary

²⁶We use the 2003 population because the wages in 2005, the first year of the legislature, had to be set by the previous legislature in power between 2001 and 2004. Since wage changes are usually done during the last year of the legislature and population estimates are only available at the end of the year, legislators choosing wages in 2004 were most likely regulated based on the 2003 population figures. The results are virtually the same using the 2004 population figures.

caps as the excluded instrument. Under this specification, for every unit increase in the salary cap (in R\$), legislator salaries increase by 35 cents.

In the remaining columns of Table 4, we present estimates of the first-stage under different assumptions for the functional form of population. In column 4, we specify a third-order polynomial along with a piecewise quadratic spline at the first cutoff. In column 5, we specify a third-order polynomial along with a piecewise quadratic spline at the first two cutoffs.²⁷ Under both of these specifications, the salary cap is again highly predictive of wages with estimates ranging from 0.561 to 0.655. Moreover, independent of functional form assumption, the regressions fit the data well, explaining almost 80 percent of the variation in wages.

As we discussed in Section 4, our preferred specification for much of the analysis uses the salary cap as our excluded instrument and controls for a third-order polynomial in population while allowing for quadratic spline on the first cutoff. As a test of whether this specification properly fits the data, we perform a goodness-of-fit test proposed by Lee and Card (2008), where we bin the data into intervals of 50 and create dummy variables for each interval. We then re-estimate our preferred specification controlling for the full set of dummy variables and compute an F-statistic. We find that we cannot reject the restricted model (F-stat= 0.99; p-value = 0.49) suggesting that our functional form assumption fits the data well. Moreover, we also present a full set of estimates for various alternative functional forms assumptions as evidence of robustness.

Smoothness condition and other potential confounds

The general concern with our identification strategy is the possibility that some other determinant of political performance or selection also exhibits a stepwise function or is discontinuous at the various cutoff points. Although we cannot directly test this assumption for unobserved characteristics, we can examine whether observable characteristic have discontinuous breaks. Figure 2 presents a series of municipal characteristics plotted against population. Each figure depicts population cell means of the municipal characteristic for the first three population thresholds (which represents 96 percent of the observations) along with the fitted values of a locally weighted regression calculated

²⁷Given that most of the data lie within the first two cutoffs, we do not have enough power to specify a fully flexible specification at all cutoffs.

within each segment.²⁸ Consider, for example, average wages in the private sector, which is a measure of a legislator’s opportunity costs and a strong predictor of legislators’ salaries. As Figure 2 depicts, private sector wages are smooth across each of the three cutoff points. This lies in stark contrast to the distribution of wages for legislators. We also graph the following pre-determined characteristics: log income per capita, total expenditure in 2000, effective number of political parties in 1996 election, assistants per legislators and hours in session. In general, the figures show only small differences at each threshold points.

These results address another potential concern. If the legislatures that offered higher wages also provided other non-wage job attributes or perks that directly affect the utility of politicians, then we might be overestimating the effects of wages on performance and selection. But as Figure 2 depicts, there are no discontinuities in the two important non-pecuniary features of the legislature: number assistants (used by politicians for patronage) and number of hours the legislature functions. Alternatively, and perhaps a more reasonable situation would be for legislatures just below the population cap to provide perks to compensate for the lower salary (e.g. cell phones, fuel for cars). If this was the case, then the effects of wages would be underestimated.

In appendix table A1, we tests whether either the salary caps (column 2) or the population cutoffs (column 3) are predictive of a larger set of municipal and mayor characteristics. Overall, the table confirms that there are no significant differences at the cutoff points for various characteristics of the municipality. The only exceptions, among 20 characteristics, are income inequality and the age of the mayor in 2000.

As a last specification test of our design, Figure 3 plots the density of population. If there were any discontinuities in the density at the cutoff points, one might be concerned that municipalities were manipulating their population count in order to offer a higher wage (McCrary 2008). However, as Figure 3 depicts, the density appears continuous at the various cutoff points with no discernable discontinuities. These results are not surprising given that the population statistics are inter-census projections computed by the Brazilian Statistical Office (IBGE), which is an independent government body.

²⁸We excluded the 4th and 5th cutoffs for presentational purposes. To include these additional observations does not affect the results.

Two-Stage Least Squares Estimates of Political Performance

In Table 5, we investigate whether wages affect legislative performance using the exogenous variation from the salary caps. For each dependent variable, we estimate specifications based on equation 5, where $g(P_i)$ is a third-order polynomial with a quadratic spline at the first cutoff point. The excluded instrument is a step function given by the maximum salary a municipality can offer its local legislators. In our base specification (odd-numbered columns) we only control for population (flexibly); whereas, in our full specification we adjust for the controls presented in Table 3 (even-numbered columns). The TSLS results are displayed in panel A, whereas panel B presents the reduced-form estimates.

Column 1 of Panel A reports the estimated coefficient from a TSLS regression where the dependent variable is the number of bills submitted per legislator. In the first specification, which only adjusts for the population of the municipality, we find a strong positive relationship suggesting that a 20 percent increase in wages increases the number of bills submitted by 25 percent, which represents an additional 3 bills per legislature per year. In column 2, we report our full specification and find that the point estimate is similar with additional controls. Even though the number of bills submitted does capture a measure of politician's effort, perhaps more important for society is whether these bills get approved. In columns 3 and 4, we re-estimate the specifications reported in the first two columns but use the number of approved bills per legislator. We also find a significant and positive relationship between wages and the number bills approved, with a point estimate of 0.515 (robust standard error = 0.122).

The remaining columns of Table 5 report the estimated effects of wages on indicators of the efficiency of the legislative process. We find that legislatures with higher wages have a higher probability of having a functioning commission, but the effect is small (a 20 percent increase in wages increases the chances of having a commission by 2 percent). Higher wages are also associated with a 10 percent increase in the likelihood that the legislature holds public events to discuss new projects.

The IV estimates presented in Table 5 are larger than the OLS estimates presented in Table 3. This comparison suggests that our OLS estimates are under-estimated. This could be the case if

higher wages tend to crowd-out intrinsically motivated politicians, in which case the OLS estimates underestimate the true effects of salary increases (Besley and Ghatak 2005). Alternatively, and perhaps more likely, the differences reflect the fact that our IV estimates are estimated locally and the response can be quite heterogeneous. Our estimates suggest that the marginal legislature that is affected by the salary cap is more responsive than the effects for the average legislature. In sum, the estimates presented in Table 5 suggest that wages have an important effect on legislative productivity. Local legislatures that pay their elected officials higher wages have more bills submitted and approved and are more likely to have functioning commissions and discuss new projects in a public forum. But whether these legislative acts map into population welfare gains is not entirely obvious, especially given that we are unable to distinguish the type of bills in our data. In the next section, we explore one potential effect of legislative quality given by the provision of public services.

The Effects of Wages on Public Goods

Table 6 presents the relationship between wages and the provision of various public goods and services. For each dependent variable, we estimate equation 5 controlling for our full set of covariates. Columns 1-3 present the effects of wages on various educational inputs, columns 4-6 present the effects on health inputs, and column 7 presents the effects on household access to sanitation.

Column 1 reports the effects of wages on the number of primary schools per school-aged child in 2006. We find that while an increase of wages leads to more primary schools, the effects are relatively modest: a 20 percent increase in wages increases the number of schools by 0.12 schools per 1000 kids. Moreover, for municipalities that offer higher wages, there is a slight increase in the likelihood that its schools have a science lab (column 2) and a computer lab (column 3).²⁹ In columns 4-6, we also find that higher wages affect the provision of health services. For instance, a 20 percent increase in wages increases the likelihood that the municipality has a health clinic by 5 percentage points, which represents a 7 percent increase. Consistent with the effects on health clinics, we also find an effect on the number of doctors per capita (point estimate = 0.355;

²⁹The results are similar if, instead of levels in 2006, we use the change in the stock of public of goods from 2001-2006 as a measure of new public goods.

robust standard error=0.08), and the average number of doctor visits per household per year (point estimate 0.214; robust standard error= 0.050). Finally, the effect of wages on the share of households with sanitation connections is small and not measured with much precision (column 7).

In sum, increases in salaries are associated with improvements in the performance of politicians measured by their legislature activities and the provision of some public goods and services. These results are consistent with our standard political economy model whereby higher salaries increase the value of holding office in the future and induce more effort. However, another possible interpretation is that the results are driven exclusively by selection: higher wages attract higher quality politicians and/or retain politicians who would otherwise leave office and thus increase legislative experience. Both effects could in principal induce better performance (Padro-i Miguel and Snyder (2006) and Caselli and Morelli (2004)). We next investigate whether this is the case.

5.2 The Effects of Wages on Political Selection

To test whether increases in salaries affected political selection of the 2005-2008 legislature, we estimate a series of regressions based on equation 5, but use the characteristics of politicians as dependent variables. The results are presented in Table 7.

Overall, we find that while wages did create positive selection on the quality of elected politicians, the effects are small. For instance, our estimates imply that a 20 percent increase in wages led to a 0.18 increase in years of schooling (for an average schooling of 9 years, this is equivalent to a 2 percent effect, see column 1 of panel A). But, as indicated in columns 2-8 of Panel A, the effects are driven by an increase of the share of higher educated politicians and a decrease in the share of politicians with less than primary education. We also see some indication that higher salaries attract politicians from higher skilled jobs, as a 20 percent increase in salaries leads to 5.3 percent increase in the share of elected politicians from a high skilled occupation. In Panel B, we also find evidence that higher salaries lead to more experienced politicians, as a 20 percent increase in wages increased the average terms of experience by 0.05 terms.

Behavior versus selection

The results presented in Table 7 suggest that higher wages induced a positive selection on various characteristics (e.g. education, experience, occupation type). And even though the effects are small in magnitude, they may still have an effect on legislative performance. If there are significant spillovers associated with quality in small legislatures (the average council size is only 9 members), then having just one more high quality legislator could be enough to create positive externalities and improve performance. In Table 8, we try to disentangle these two effects.

Although our research design does not allow us to separately identify whether higher wages increase performance through effort (rather than selection), we can test whether wages still affect our measures of performance after accounting for the changes in the composition of the legislative body. Assuming that the observed characteristics of the politicians are correlated with their unobserved characteristics, then this approach attributes to the observed characteristics of the legislature all the effects of the unobserved variables. Thus, if politician productivity is largely due to changes in the pool of local legislators, then we would expect that accounting for these differences should attenuate the wage effects.³⁰

Panel A of Table 8 shows that some characteristics of the legislative body have significant power in predicting legislative performance. More educated and male-dominated legislative bodies are associated with higher performance along some dimensions. We do however find that adjusting for the observable differences has only a minimal effect on the wage coefficient; in most cases, attenuating the effects only slightly. Thus, if the politicians' unobserved abilities are correlated with their measured characteristics, selection cannot entirely explain our results. In addition for controlling for the changes in the composition to the legislative body, in panel B, we also control for a third-order polynomial in the share of legislators from the 2001-2004 legislature that were re-elected in 2004. In doing so, we account for in a highly flexible manner, legislatures that underwent significant turnover. The effects of wages on political performance again remain unchanged.

³⁰An obvious concern with this test is that we can only capture observable differences in politician characteristics, and controlling for these difference may not be sufficient to partial out all the effects of the unobserved variables. For instance, higher wages may have encouraged more able politicians and if ability is not captured in the observable differences, we are not fully accounting for the selection effect.

5.3 Effects of wages on political entry and re-election rates

If higher wages are inducing elected politicians to submit more bills and petitions for more public goods, then presumably they are exerting this additional effort in hopes of getting re-elected. This intuition is consistent with the findings of Diermeier, Keane, and Merlo (2005), where a salary increase for members of the U.S. House of Representatives will increase the probability of running for re-election. Given the large incumbency advantages present in the U.S. Congress, higher wages will lead to higher re-election rates. An important limitation of their study, however, is that their simulations are restricted to the behavior of incumbent members of Congress. Thus, their analysis does not take into account the effects of wages on the candidate pool. But as we demonstrated in Section 2, if higher wages also attract more and higher quality candidates to run for office, as predicted in Caselli and Morelli (2004), then higher wages may not increase reelection rates in equilibrium.

Political entry

Table 9 examines whether higher salaries affected political entry in the 2008 elections. Column 1 of panel A presents the TSLS results for the effect of wages on the number of candidates per seat, excluding incumbents that ran for election in 2008. The estimated coefficient on wages is 0.589 (robust standard error = 0.269) which suggests that a 20 percent increase in wages increases political competition by 0.22 new candidates per seat, or approximately 2 candidates per election. From the results in columns 2-4 of panel A, the increases in the number candidates appear to come from an increase in the entry of smaller parties, rather than larger parties putting forth more candidates. This result is not too surprising given Brazil's open-list proportional representation system which encourages fragmentation of parties (Myerson 1993). Moreover, because legislators in Brazil are elected based on the d'Hondt method, members of smaller political parties are often elected despite having fewer vote totals than losing candidates of larger political parties (Ames 1995).

In addition to these effects on political participation, Table 9 shows that wages affect the quality of the candidate pool. In municipalities that offer higher wages, the candidates are wealthier

(column 6), from higher skilled occupations (column 7), and more educated (see panel B).³¹ Similar to the 2004 elections, the positive selection on education and occupation are relatively small. The results in Table 9 also suggest that not only do higher wages attract higher quality candidates, but they also induce candidates to spend more during their campaigns. Among these new candidates, a 20 percent increase in salaries increases campaign expenditures by 7.5 percent.

Re-election rates

Given that increases in salaries improve performance, but also increase political competition (new entry), it is not clear ex-ante whether reelection rates should increase or decrease. In Table 10, we test whether higher wages increased re-election rates of the 2005-2008 legislature. Column 1 reports the estimated slope coefficient from a TSLS regression where the dependent variable is the proportion of legislators that ran for re-election 2008. In municipalities that offered higher wages, there is a slight increase in the proportion of legislators who ran for re-election, but the effects are small and statistically insignificant. In column 2, we show that higher wages are associated with a statistically significant increase in re-election rates, and the effects are higher when we condition on those that ran for re-election. For instance, a 20 percent increase in wages increased re-election rates by 3.2 percent. In columns 4 and 5, we find that re-election rates appear higher among more educated legislators, although the estimates are not measured with much precision. The reduced-form effects of wages on re-election rates are relatively small, but as our theory suggests, reflect the combination of two main effects. Although incumbent legislators are submitting for more bills and public goods, thus increasing their re-election chances, more and richer opponents are entering the races thus decreasing the effects on re-election rates in equilibrium.

Finally in column 6, we also see that among the legislators that ran for re-election in 2008, higher wages also induced more campaign spending. This is again consistent with the fact that both the value of holding office and political competition have increased, thus inducing candidates to spending more on campaigning.

³¹Gagliarducci and Nannicini (2009) find similar effects for the entry decisions of Italian mayors. A 33 percent increase in wages increases years of schooling of candidates for mayor by 6.5 to 8.4 percent.

5.4 Discussion

Specification Tests

Given the differences in income inequality across the third population threshold and some of the other slight differences in the observable characteristics, we re-estimate all the models presented in Tables 5-10 including a flexible-functional form for each of our control variables (a fourth-order polynomial). The results are presented in column 1 of Table 11, where each coefficient is the TSLS estimate of the dependent variables listed in each row on wages.³² As column 1 reports, the estimates are not only similar, but in many cases measured with more precision.

Column 2-9 presents a series of different specifications to test whether our results are sensitive to the functional form assumption for population. In column 2, we re-estimate the model with a third-order polynomial in population but allow for a quadratic spline at the first two thresholds, which contain most of the data. In column 3, we estimate the model presented in Equation 6. In this model we use the cutoffs as the excluded instruments and specify a piecewise linear spline at each of the five cutoffs. In columns 4-9, we re-estimate our original model under various functional forms assumptions for population but restrict the sample to observations close the discontinuities (i.e. the set of observations that are 5 and 10 percent above and below the cutoff points).

Overall the results are remarkably robust. When we restrict the sample to observations near thresholds we lose some precision, but in general the point estimates are of similar magnitude with the previous estimates. Despite the overall robustness of these results, the effects of wages on the number of primary schools are weaker and much more sensitive to functional form assumptions. Thus, it is difficult to conclude that higher wages necessarily lead to more schools.

Tests of potential confounds

An important contribution of our paper is the use of discontinuities in the wages that local legislators receive to identify the effects of wages on performance and selection. One potential threat to our research design comes from the possibility that other government policies are discontinuous at the

³²We omitted some of the variables simply for the sake of brevity. All of the omitted variables provide consistent results.

same cutoffs. Although we find no evidence that other characteristics of the municipality change discontinuously at these cutoff points, both the size of the legislature and the amount of block grants (called Fundo de Participação dos Municípios (FPM)) transferred to municipalities do vary according to other population cutoffs. However, there are several reasons why these other policies are unlikely drive our results.

First, even though the FPM block grant was designed to be allocated discontinuously according to population, the rule was only binding until the early nineties. In fact, Litschig (2010) uses this variation to examine the effects of the block grant on educational outcomes during the 1980's. However due to a large process of fragmentation among municipalities, the government passed a law in 1997 allowing municipalities that had their population reduced to keep the original transfers. This grandfathering rule made the amount of the FPM block grant that was actually received (as opposed to the hypothetical amount) much more continuous across the designed population thresholds. We show this in Figure A2.³³ For this reason, the actual amounts of the block grants do not vary as discontinuously as our wage function.

Second, in columns 10 and 11 of Table 11, we present estimates of our model where we control for a fourth degree polynomial in the amount of the block grant and the size of the legislature. In both cases, controlling flexibly for these characteristics does not affect our results. Moreover, recall that our approach of using only those municipalities just around the cutoff points isolates our results from the effects of many of these other discontinuities (see columns 4-9, Table 11), providing another reason why it is unlikely that these blocks grants or the size of the legislature are driving our results.

Third, in Table A2, we estimate the extent to which the block grant affects our measures of political selection and performance, restricting the estimation sample to sets of municipalities where the salary caps do not vary. In column 1 we use municipalities with a population between 10,108 and 44,148 and in column 2, we use municipalities with a population between 50,940 and 91,692.³⁴ Table A2 reports the F-test on the joint significance of the block grants indicators. Again, we find

³³Each panel plots the relationship between the actual amounts of blocks grants the municipality received in a given year against the municipal population.

³⁴Within these two intervals the block grants have the following cutoffs: 13584 16980, 23772, 30564, 37356, 44148, 50940, 61128, 71316, 81504 91692

that the block grant does not have any effect on our dependent variables.

Finally, as a further check of the validity of the discontinuities, we re-estimate the first-stage equation in model 6 using a set of hypothetical discontinuities that have been shifted over by increments of 500 inhabitants from the true discontinuities. For the set of hypothetical discontinuities, we record the F-statistic associated with the excluded instruments. In Figure A3, we plot the relationship between these F-statistics and the amount that the hypothetical discontinuities have been displaced from the true values. From the figure, we see that the F-statistic is indeed maximized at zero (i.e. the true discontinuity). As the values of discontinuities are either increased or decreased, the F-statistics decline in a fairly symmetric fashion. Overall, these various tests provide robust evidence that other policies are not responsible for our findings.

6 Conclusions

Despite the general consensus that good governance matters for economic development, there is much less agreement on which aspects of governance are important or how it can be improved. The existing political economy literature has mostly focused on how incentives shape the quality of government. But, recent studies have emphasized the importance of political selection. Institutions and policies are shaped by those holding power, so improvements in governance may require good leaders (Besley 2006).

In this paper, we estimate the effects of financial incentives on legislative performance and political selection. While there has been a growing theoretical literature that examines how monetary rewards to politicians affect political selection (Caselli and Morelli (2004), Matozzi and Merlo (2008)), data limitations and identification concerns have limited the empirical tests of these models. Moreover, little is known about how monetary rewards affect politicians' performance (Besley 2006).

Our empirical analysis suggests that financial incentives can play an important role in increasing political competition and improving the performance and quality of legislators. Importantly however, whether these effects ultimately translate into improvements in voters' welfare remains an open question. While we find an increase in a number of visible public goods (e.g. number

of schools, computer labs, health clinics, and doctors) in municipalities that offer higher salaries, there may be decreases in certain public goods that are not captured in our data (e.g. roads improvements, agricultural investments, etc). Without a more comprehensive data on public goods and services and other dimensions of political quality (e.g. honesty and competence), it is difficult to fully assess the welfare effects of increasing politicians' salaries.

Although our study focuses exclusively on monetary rewards, politicians have a variety of motivations for holding public office. Some derive personal satisfaction from being in power or experience an intrinsic benefit based on a sense of civic duty; others desire to implement their preferred policies because of ideology or to satisfy special interest groups (see for instance Callander (2007), Dal Bó, Dal Bó, and Di Tella (2006), Besley (2006) and Persson and Tabellini (2000)). Thus more research is needed to understand how these other motivations affect policy, particularly in an environment where agents are intrinsically motivated (Benabou and Tirole (2003); Besley and Ghatak (2005); Prendergast (2008)).

References

- Acemoglu, Daron, Georgy Egorov, and Konstantin Sonin. 2010. "Political Selection and Persistence of Bad Governments." *Quarterly Journal of Economics*, forthcoming, January.
- Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91:1369–1401.
- . 2003. "An African Success Story: Botswana." In *In Search of Prosperity: Analytical Narrative on Economic Growth*, edited by Dani Rodrik. Princeton, NJ: Princeton University Press.
- Ames, Barry. 1995. "Electoral Strategy under Open-List Proportional Representation." *American Journal of Political Science* 39 (2): 406–433 (May).
- Angrist, Joshua D., and Victor Lavy. 1999. "Using Maimonides Rule to Estimate the Effect of Class Size on Scholastic Achievement." *Quarterly Journal of Economics* 114:533–575.
- Barro, Robert. 1970. "The Control of Politicians: An Economic Model." *Public Choice* 14:19–42.
- Benabou, Roland, and Jean Tirole. 2003. "Intrinsic and Extrinsic Motivation." *Review of Economic Studies* 70 (3): 489–520.
- Besley, Tim, Torsten Persson, and Daniel Sturm. 2010. "Political Competition, Policy and Growth: Theory and Evidence from the United States." *Review of Economic Studies*, forthcoming.
- Besley, Timothy. 2004. "Paying Politicians: Theory and Evidence." *Journal of the European Economic Association* 2:193–215.
- . 2006. *Principled Agents? The Political Economy of Good Government*. Oxford, UK: The Lindahl Lectures, Oxford University Press.
- Besley, Timothy, and Anne Case. 1995. "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits." *The Quarterly Journal of Economics* 110 (3): 769–798 (August).
- Besley, Timothy, and Stephen Coate. 1997. "An Economic Model of Representative Democracy." *Quarterly Journal of Economics* 112:85–114.
- Besley, Timothy, and Maitreesh Ghatak. 2005. "Competition and Incentives with Motivated Agents." *American Economic Review* 95 (3): 616–636.
- Callander, Steven. 2007. "Political Motivations." *Review of Economic Studies*, forthcoming.
- Caselli, Francesco, and Massimo Morelli. 2004. "Bad Politicians." *Journal of Public Economics* 88:759–782.

- Chattopadhyay, Raghavendra, and Esther Dufflo. 2004. "Women as Policy Makers: Evidence from a India-Wide Randomized Policy Experiment." *Econometrica* 72 (5): 1409–1443.
- Dal Bó, Ernesto, Pedro Dal Bó, and Rafael Di Tella. 2006. "Plata o Plomo?: Bribe and Punishment in a Theory of Political Influence." *American Political Science Review* 100 (1): 41–53 (February).
- De Long, J. B., and A. Schleifer. 2003. "Princes or Merchants? City Growth before the Industrial Revolution." *Journal of Law and Economics*, pp. 153–177.
- Di Tella, Rafael, and Ray Fisman. 2004. "Are Politicians Really Paid Like Bureaucrats?" *The Journal of Law and Economics* 47:477–513.
- Diermeier, Daniel, Michael Keane, and Antonio Merlo. 2005. "A Political Economy Model of Congressional Careers." *American Economic Review* 95:347–373.
- Ferejohn, J. 1986. "Incumbent Performance and Electoral Control." *Public Choice* 50:5–25.
- Ferraz, Claudio, and Frederico Finan. 2010. "Electoral Accountability and Corruption: Evidence from the Audits of Local Governments." *American Economic Review*, forthcoming.
- Gagliarducci, Stefano, and Tommaso Nannicini. 2009. "Do Better Paid Politicians Perform Better? Disentangling Incentives from Selection." *IZA Discussion Paper Series*, no. 4400.
- Gagliarducci, Stefano, Tommaso Nannicini, and Paolo Naticchioni. 2010. "Moonlighting Politicians." *Forthcoming Journal of Public Economics*.
- Jones, Ben, and Ben Olken. 2005. "Do Leaders Matter? National Leadership and Growth since World War II." *Quarterly Journal of Economics* 120 (3): 835–864 (August).
- Knack, Stephen, and Philip Keefer. 1995. "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures." *Economics and Politics* 7 (3): 207–227.
- Lee, David, and David Card. 2008. "Regression discontinuity inference with specification error." *Journal of Econometrics* 142 (2): 655–674.
- Lee, D.S., E. Moretti, and M. Butler. 2004. "Do Voters Affect or Elect Policies? Evidence from the U.S. House." *Quarterly Journal of Economics* 119:807–859.
- Litschig, Stephan. 2010. "Financing Development: Quasi-Experimental Evidence from Municipalities in Brazil, 1980-1991." *Working Paper*.
- Lopez, Felix G. 2004. "A Política Cotidiana dos Vereadores e as Relações entre Executivo e Legislativo am Âmbito Municipal: o Caso do Município de Araruama." *Revista de Sociologia Política* 22:153–177.
- Matozzi, Andrea, and Antonio Merlo. 2008. "Political Careers or Career Politicians?" *Journal of Public Economics* 92 (April): 597–608.

- McCrary, Justin. 2008. "Testing for Manipulation of the Running Variable in the Regression Discontinuity Design." *Journal of Econometrics* 142, no. 2 (February).
- Melo, Marcus. 2005. "Instituições Orçamentárias Municipais e o Processo Legislativo em Recife-1988-2000." In *Desenho Institucional e Participação Política*, edited by Catia Lubambo, Denilson B. Coêlho, and Marcus A. Melo. Petrópolis: Editora Vozes.
- Messner, Matthias, and Mattias Polborn. 2004. "Paying Politicians." *Journal of Public Economics* 88:2423–2445.
- Munshi, Kaivan, and Mark Rosenzweig. 2008. "The Efficacy of Parochial Politics: Caste, Commitment, and Competence in Indian Local Governments." *Mimeo*, May.
- Myerson, Roger. 1993. "Effectiveness of Electoral Systems for Reducing Government Corruption: A Game Theoretical Analysis." *Games and Economic Behavior* 5:118–132.
- North, Douglas. 1981. *Structure and Change in Economic History*. New York: Norton.
- Osborne, Martin J., and Al Slivinski. 1996. "A Model of Political Competition with Citizen-Candidates." *Quarterly Journal of Economics* 88:2423–2445.
- Padro-i Miguel, Gerard, and James M. Snyder. 2006. "Legislative Effectiveness and Legislative Life." *Legislative Studies Quarterly* 31 (3): 347–381 (August).
- Pereira, Carlos, and Bernardo Mueller. 2002. "Comportamento Estrategico em Presidencialismo de Coalizao." *Dados* 45 (2): 265–301.
- Persson, Torsten, Gerard Roland, and Guido Tabellini. 1997. "Separation of Powers and Political Accountability." *The Quarterly Journal of Economics* 112 (4): 1163–1202 (November).
- Persson, Torsten, and Guido Tabellini. 2000. *Political Economics: Explaining Economic Policy*. Cambridge, Massachusetts: MIT Press.
- Prendergast, Canice. 2008. "Intrinsic Motivation and Incentives." *American Economic Review* 98 (2): 201–205.
- Smart, Michael, and Daniel M. Sturm. 2006. "Term Limits and Electoral Accountability." *CEPR Discussion Paper 4272*, July.
- Van Der Klaauw, W. 2002. "Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression Discontinuity Approach." *International Economic Review* 43:1249–1287.
- Weingast, Barry R., and William J. Marshall. 1988. "The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets." *Journal of Political Economy* 96 (1): 132–163.

Appendix A: Data Sources

The data used in the paper comes from a variety of sources. The data is at the level of the municipality, the lowest government unit below a state in Brazil. The main data source is the legislative census collected during 2005 by the Interlegis, a branch of Brazil's senate. Although Brazil's had 5,564 municipalities recorded as of 2005 by Brazil's Statistical Office (IBGE), the legislative census only recorded information from 5,414 municipalities. Next, we describe the source of each variable used in the analysis.

Legislature characteristics: Characteristics of the legislature come from the 2005 legislative census. Next to the answers to the questions on the wages there was a question to whether the person answering the question was sure about the wages. We restricted our analysis to answers where the informant was sure about the wage and removed some remaining outliers that represented less than 1 percent of the sample. The variables used in the analysis are as follows: *Legislator's salary* – monthly salary paid to local legislators, expressed in Reais; *Number of legislators* – the size of the legislature in 2005; *Weekly hours* – the number of hours per week the legislature is open; *Assistants per legislator* – the average number of assistants each legislator has; *Bills submitted per legislator* – the number of bills submitted in 2005 divided by the size of the legislature; *Bills approved per legislator* – the number of bills approved divided by the size of the legislature; *Functioning Commission* – an indicator variable for whether the legislature has a commission that functions; *% female legislator* – the number of female legislators divided by the size of the legislature; *% legislators age < 40* – share of the legislature that is less than 40 years old; *% legislators age 40 – 49* – share of the legislature that is between 40 – 49 years old; *% legislators age > 49* – share of the legislature that is older than 40 years old; *% legislators in 1-2 mandate* – share of the legislature with 1-2 terms of experience; *% legislators in 3-7 mandate* – share of the legislature with 3-7 terms of experience; *Years of schooling* – the average years of schooling of legislators.

Politician's Characteristics: the Tribunal Superior Eleitoral (TSE) provides basic demographic information on each candidate that ran in the 2004 municipal elections. These data is available at www.tse.gov.br. We use this information to create the following municipal level indicators: *Number of candidates per seat* – the number of candidates that ran for local legislator divided by the size of the legislature; *Age* – the average age of the candidates that ran for office in 2004; *% female* – the share of candidates that were female; *Years of Schooling* – the average years of schooling for the candidates.

Municipal demographic characteristics: Demographic characteristics of the municipality come from 2000 population census, available at IBGE (www.ibge.gov.br). The estimate for the 2003 population was obtained from the IBGE inter-census population estimates. The variables used in the analysis are: *% Urban population* – the number of inhabitants that live in urban areas divided by the population; *Gini coefficient* – income inequality based on household income in 2000; *Literacy Rate* – share of the population that is literate; *% households with electricity* – share of households

with access to electricity; *Household income per capita* – Total household income divided by the number of persons residing in the household.

Municipal institutional and public management characteristics: the 2002 and 2005 surveys of the *Perfil dos Municípios Brasileiros: Gestão Pública* provide information on various aspects of the public administration, such as budgetary and planning procedures, the number of public employees. It also provides us with structural features such as the existence of local radio and the presence of a judge and public prosecutors.

Municipal public finance information: the National Treasury (Secretaria do Tesouro) provides information of spending and revenues through the FINBRA dataset. It contains municipal spending by categories and revenues by sources (i.e. local taxes, intergovernmental transfers). See www.tesouro.com.br

Private sector wages: the RAIS provides information of public and private sector wages for all (formal) firms in Brazil. We use this data to construct a measure of the average wage of private sector employees in municipalities.

School data: information on the number of primary schools (Ensino fundamental), their characteristics (whether they have a science or computer lab), and their teacher's characteristics is available from Edudata (www.edudata.gov.br), based on yearly school census undertaken by INEP.

Health data: information on the number of clinics managed by the municipal government and the number of doctors was taken from the Cadastro Nacional de Estabelecimentos de Saúde (CNES). The information is only available at www.datasus.gov.br for 2006. Data on the average number of medical visits for 2006, was obtained from the Indicadores do Pacto de Atenção Básica 2006 and are available at www.datasus.gov.br.

Water and Sanitation data: information on sanitation and water network extension and connections was obtained by the *Sistema Nacional de Informações sobre Saneamento* (SNIS). The information is available at www.snis.gov.br. The information is collected using a survey of sanitation service providers in a representative sample of municipalities.

Appendix B: Examples from Legislators' Webpages

Vereadora Ana Selma, Câmara Municipal de Cabo de Santo Agostinho, PE

<http://anaselma.blogspot.com/>

Vereadora Ana Selma visita Cidade Garapu

Na sexta-feira passada, 22, Ana Selma e equipe estiveram, mais uma vez, em visita ao Loteamento Cidade Garapu. Na oportunidade, foram distribuídos panfletos, cujo teor tem o objetivo de prestar contas aos moradores da localidade sobre as iniciativas da Vereadora nos últimos três anos. Presença constante no Loteamento Cidade Garapu, a Vereadora Ana Selma tem se colocado ao lado dos moradores na luta por melhorias para o Bairro, realizando visitas aos moradores; Gabinete na Rua e reuniões com lideranças e representantes de entidades.

Veja algumas das iniciativas da Vereadora na Câmara para Garapu:

- Indicação solicitando a construção de uma **Escola de Ensino Fundamental e Educação Infantil**;
- Indicação solicitando providências para instalação de um **Posto do Programa Saúde da Família - PSF**;
- Indicação solicitando a **intensificação de rondas policiais** no Loteamento Cidade Garapu e adjacências;
- Indicação solicitando a **instalação de abrigos para a espera do transporte coletivo**;

Vereador Romério, Câmara Municipal de Resende, RJ

<http://www.vereadorromerio.blogspot.com/>

Luta por melhor qualidade na educação

Ao longo do seu mandato, Romério, conseguiu a aprovação de diversas indicações que trariam mais qualidade à Educação Pública no Município, dentre elas temos:

- A **aquisição de jornais e revistas** para as bibliotecas das escolas;
- **Implantação do ensino de informática** desde a 5 série até o 3 ano do ensino médio;
- **Construção de laboratórios de ciências e informática** nas escolas, entre outras.

Infelizmente, nada foi feito pelo Poder Executivo, neste sentido, mas Romério garante continuar lutando para diminuir a distância entre o ensino público e o particular.

Vereador José Damaso, Câmara Municipal de Palmas, TO

<http://damasovereador.blogspot.com>

Este é o blog do vereador Damaso. Aqui você vai encontrar as notícias sobre seu mandato e suas ações em benefício da população palmense.

A exemplo do que ocorreu em 2005, nessa legislatura na Câmara Municipal de Palmas, o vereador Damaso (PDT) já apresentou diversos requerimentos que levam benefícios para a região Sul de Palmas:

- O vereador também apresentou requerimento que solicita a **construção de salas** para alunos com necessidades especiais na área disponível da Escola Municipal Tiago Barbosa.
- Em outra propositura, o parlamentar solicitou a **implantação de um posto da Polícia Comunitária** no setor Taquari.
- Em requerimento apresentado nesta quarta-feira, na Câmara Municipal de Palmas, o vereador Damaso (PDT) solicitou a **abertura de um ambulatório médico** em Taquaralto.

Table 1. Constitutional Amendment No. 25, 2000

Population bracket	Cap on salary as a percentage of state legislators salary	Value of maximum allowed salary in 2004	Cap on legislative spending as a proportion of revenues	Average legislative spending as a proportion of revenues	Cap on salary spending as a proportion of legislative spending
0 to 10,000	20%	1927.1	8%	3.6%	75%
10,001 to 50,000	30%	2890.6	8%	3.0%	75%
50,001 to 100,000	40%	3854.2	8%	2.8%	75%
100,001 to 300,000	50%	4817.7	7%	2.6%	75%
300,001 to 500,000	60%	5781.2	6%	2.7%	75%
500,000 plus	75%	7226.6	5%	2.6%	75%

Notes: The population brackets and the caps on the salaries are defined by the Constitutional Amendment No. 25, 2000. The approximate salaries in 2004 are calculated based on the salary of Federal Deputies of R\$ 12,847.2. The maximum legislative spending is defined as a proportion of revenues, defined as the sum of tax revenues and intergovernmental transfers in the previous year.

Table 2. Descriptive Statistics

	N	Mean	S.D.	Quantiles				
				0.10	0.25	0.50	0.75	0.90
<u>Legislature characteristics:</u>								
Number legislators	5093	9.25	1.31	9.00	9.00	9.00	9.00	9.00
Legislator wages	5093	1707.66	1031.26	750.00	950.00	1400.00	2261.00	2891.00
Weekly hours	5093	10.63	7.52	4.00	8.00	8.00	12.00	20.00
Assistants per legislator	5093	0.51	0.77	0.00	0.11	0.33	0.56	1.00
Bills submitted per legislator	3544	1.11	2.19	0.11	0.22	0.56	1.11	2.33
Bills approved per legislator	3544	0.80	1.26	0.11	0.22	0.44	0.89	1.78
Share of bills approved	3544	0.83	0.28	0.37	0.73	1.00	1.00	1.00
Functioning commissions (1/0)	5093	0.85	0.36	0.00	1.00	1.00	1.00	1.00
Public events to discuss projects (1/0)	5093	0.29	0.46	0.00	0.00	0.00	1.00	1.00
<u>Local public goods in 2006</u>								
Number of schools per school aged children (x1000)	5004	3.97	3.46	0.85	1.48	2.90	5.53	8.55
Municipal school has a computer lab (1/0)	5004	0.41	0.49	0.00	0.00	0.00	1.00	1.00
Municipal school has a science lab (1/0)	5004	0.14	0.35	0.00	0.00	0.00	0.00	1.00
Health clinic (1/0)	4200	0.69	0.46	0.00	0.00	1.00	1.00	1.00
Number of doctors per capita (x1000)	5059	1.76	1.27	0.50	0.86	1.44	2.34	3.40
Number of doctor visits per household per year	5094	0.59	0.47	0.01	0.19	0.56	0.86	1.16
Share of population with sanitation connects	4155	0.66	0.28	0.29	0.46	0.67	0.86	0.98
<u>2004-2008 Legislators Characteristics</u>								
Years of schooling	5091	9.84	2.10	7.11	8.33	9.89	11.33	12.56
Share of legislators from a high skilled occupation	5093	0.28	0.20	0.00	0.11	0.22	0.44	0.56
Average terms of experience	5093	1.82	0.64	1.22	1.44	1.78	2.11	2.56
Share of male legislators	5093	0.87	0.11	0.75	0.78	0.89	1.00	1.00
Share of 2000-2004 legislature that was re-elected in 2004	5093	0.36	0.15	0.18	0.23	0.33	0.44	0.56
Share of 2004-2008 legislature that ran for re-election in 2008	5093	0.75	0.17	0.56	0.67	0.78	0.89	0.92
Share of 2004-2008 legislature that was re-elected in 2008	5093	0.40	0.17	0.22	0.33	0.44	0.56	0.60
Share of 2004-2008 legislature that was re-elected in 2008 conditional on running	5083	0.53	0.20	0.29	0.40	0.56	0.67	0.80
Average campaign spending (logs)	4979	7.19	0.95	6.09	6.59	7.19	7.72	8.22
<u>2008 New Candidates Characteristics:</u>								
Number of candidates per seat	5086	5.15	3.40	1.89	2.67	4.22	6.70	9.89
Number of political parties per seat	5086	1.13	0.47	0.56	0.78	1.00	1.44	1.78
Number of major political parties per seat	5086	1.25	0.80	0.33	0.67	1.11	1.70	2.33
Number of small political parties per seat	5086	5.15	3.40	1.89	2.67	4.22	6.70	9.89
Average campaign spending (logs)	4980	7.19	0.95	6.09	6.59	7.19	7.72	8.22
Average wealth (logs)	5089	11.23	0.69	10.43	10.81	11.23	11.62	11.95
Share of candidates from a high skilled occupation	5094	0.21	0.11	0.08	0.14	0.21	0.29	0.36
Share of male candidates	5094	0.78	0.08	0.69	0.73	0.78	0.83	0.88
Years of schooling	5094	9.79	1.44	7.88	8.83	9.87	10.83	11.63
<u>Municipal Characteristics:</u>								
Population (1/10000)	5094	2.62	10.80	0.31	0.51	1.04	2.15	4.65
Income per capita (logs)	5094	4.98	0.58	4.19	4.46	5.07	5.45	5.68
Share of urban households	5094	0.60	0.24	0.28	0.42	0.61	0.80	0.92
Gini coefficient	5094	0.56	0.06	0.49	0.52	0.56	0.60	0.63
Share of households with electricity	5094	0.87	0.17	0.61	0.80	0.95	0.99	1.00
Literacy rate	5094	0.78	0.12	0.60	0.68	0.82	0.88	0.92
Average wage in the municipality	5094	653.87	201.99	449.27	521.16	621.78	741.96	876.62

Notes: This table reports the mean political and socio-economic characteristics of the all the municipalities in our sample. See the data appendix for more information on the variables including their sources.

Table 3. The Effects of Politicians' Wages on Legislative Performance - OLS

Dependent variables:	Legislative activities				Public goods						
	Number of projects submitted per legislator	Number of projects approved per legislator	Functioning commission	Held public events to discuss new projects	Number of schools per school aged child (x1000)	Municipal school has a science lab	Municipal school has a computer lab	Health Clinic	Number of doctors per capita (x1000)	Average number of doctor visits per household per year	Share of population with sanitation connections
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Wages (1/1000)	0.457 [0.062]***	0.241 [0.033]***	0.045 [0.006]***	0.057 [0.008]***	0.081 [0.039]**	0.109 [0.008]***	0.067 [0.007]***	0.076 [0.008]***	0.109 [0.020]***	0.027 [0.008]***	-0.008 [0.004]**
Population (1/100000)	0.024 [0.010]**	0.014 [0.002]***	-0.001 [0.000]*	0.000 [0.000]	-1.357 [0.179]***	-0.001 [0.000]***	0.001 [0.001]*	0.000 [0.000]	-0.001 [0.001]	-0.001 [0.001]**	0.000 [0.000]
Log income per capita	0.775 [0.200]***	0.219 [0.120]*	-0.006 [0.022]	0.058 [0.028]**	-0.264 [0.182]	0.217 [0.028]***	0.107 [0.019]***	0.059 [0.032]*	1.062 [0.075]***	-0.078 [0.030]***	0.05 [0.014]***
% urban population	0.497 [0.124]***	0.346 [0.094]***	0.046 [0.028]	-0.051 [0.035]	-3.743 [0.219]***	0.094 [0.036]***	0.015 [0.026]	0.154 [0.042]***	0.384 [0.083]***	-0.033 [0.036]	0.754 [0.020]***
Gini	-1.047 [0.847]	-0.715 [0.363]**	0.300 [0.099]***	0.125 [0.124]	-3.96 [0.780]***	-0.264 [0.122]**	-0.306 [0.087]***	-0.151 [0.140]	-1.136 [0.269]***	0.089 [0.121]	0.051 [0.059]
% households with energy	-0.854 [0.202]***	-0.197 [0.159]	0.030 [0.049]	-0.073 [0.055]	-6.959 [0.443]***	0.017 [0.053]	-0.046 [0.029]	0.172 [0.064]***	0.725 [0.107]***	0.506 [0.057]***	0.087 [0.027]***
% literate	-0.980 [0.534]*	-0.055 [0.443]	0.025 [0.093]	0.151 [0.114]	-5.899 [0.779]***	-0.128 [0.111]	0.099 [0.070]	-0.435 [0.131]***	-0.764 [0.245]***	-0.6 [0.125]***	0.151 [0.058]***
Average wages (1/1000)	0.216 [0.267]	-0.088 [0.176]	0.022 [0.029]	0.089 [0.044]**	-0.261 [0.204]	0.224 [0.045]***	0.147 [0.036]***	-0.113 [0.045]**	-0.212 [0.103]**	-0.275 [0.044]***	-0.022 [0.018]
Hours functioning legislature	0.010 [0.006]*	0.010 [0.003]***	-0.001 [0.001]	0.003 [0.001]***	-0.004 [0.004]	-0.002 [0.001]**	0 [0.001]	-0.001 [0.001]	-0.003 [0.002]	-0.002 [0.001]***	0.001 [0.000]
Assistants per legislator	0.168 [0.066]**	0.127 [0.049]***	0.001 [0.004]	-0.002 [0.010]	0.122 [0.030]***	0.026 [0.008]***	0.017 [0.008]**	0.007 [0.006]	0.084 [0.027]***	-0.005 [0.008]	-0.004 [0.005]
Mean of dependent variable	1.110	0.797	0.845	0.294	3.972	0.414	0.142	0.685	1.761	0.588	0.660
Observations	3544	3544	5093	5093	5004	5004	5004	4200	5059	5094	4155
R-squared	0.18	0.16	0.02	0.04	0.49	0.20	0.17	0.05	0.31	0.08	0.53

Notes: This table reports the OLS estimates for the effects of wages on the legislative performance of 2005-2008 legislature. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets.

Table 4. First-Stage Results

Dependent variable	Wages				
	(1)	(2)	(3)	(4)	(5)
1{x>10,000}	300.221 [24.984]***	351.656 [24.126]***			
1{x>50,000}	714.156 [44.255]***	181.299 [77.649]**			
1{x>100,000}	562.203 [72.648]***	527.580 [135.854]***			
1{x>300,000}	478.769 [191.212]**	313.848 [273.066]			
1{x>500,000}	1205.685 [228.879]***	991.549 [408.177]**			
Salary caps			0.360 [0.026]***	0.655 [0.038]***	0.561 [0.035]***
Log income per capita	-127.398 [30.620]***	-130.167 [30.067]***	-130.963 [30.190]***	-113.574 [32.091]***	-141.676 [30.120]***
% urban population	137.510 [32.908]***	123.008 [31.988]***	127.164 [32.075]***	256.883 [35.209]***	131.523 [32.015]***
Gini	1151.751 [129.011]***	1172.443 [127.289]***	1182.932 [127.460]***	1442.734 [136.035]***	1125.511 [127.013]***
% households with energy	142.595 [52.751]***	143.488 [50.908]***	142.351 [51.057]***	102.902 [55.623]*	141.835 [50.587]***
% literate	174.494 [120.447]	114.378 [117.034]	106.562 [116.857]	96.972 [127.397]	200.438 [116.409]*
Average wages in the municipality	359.909 [43.119]***	317.249 [44.496]***	327.173 [44.513]***	355.260 [46.582]***	331.962 [44.882]***
Hours functioning legislature	5.535 [1.043]***	5.144 [1.021]***	5.134 [1.029]***	6.055 [1.137]***	5.510 [1.022]***
Assistants per legislator	44.818 [12.916]***	35.768 [12.411]***	35.142 [12.738]***	69.312 [16.011]***	45.031 [12.804]***
Functional form assumption on population	Log	Linear spline	Linear spline	3rd-order polynomial with quadratic on first cutoff	3rd-order polynomial with quadratic on first two cutoffs
Observations	5093	5093	5093	5093	5093
R-squared	0.76	0.80	0.80	0.80	0.80
F-test on cutoff indicators (P-values)	133.11 [0.00]	47.10 [0.00]			

Notes: This table reports the OLS estimate of the effects of the population cutoffs and salary caps on wages. The running variable x refers to the population in 2003. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The reported F-test refers to the cut-off indicators.

Table 5: The Effects of Wages on Legislative Performance

Dependent variable:	Number of Bills Submitted		Number of Bills Approved		Functioning Commission		Public events	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: IV estimates								
Wages	0.807 [0.238]***	0.672 [0.230]***	0.584 [0.125]***	0.515 [0.122]***	0.065 [0.025]***	0.062 [0.026]**	0.074 [0.033]**	0.06 [0.034]*
Panel B: Reduced-form estimates								
Salary caps	0.72 [0.220]***	0.621 [0.211]***	0.487 [0.109]***	0.429 [0.105]***	0.043 [0.020]**	0.04 [0.021]*	0.034 [0.029]	0.026 [0.029]
R-squared	0.18	0.2	0.15	0.17	0.02	0.03	0.03	0.04
Municipal characteristics	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3544	3544	3544	3544	5093	5093	5093	5093

Notes: The table reports the TSLS and reduced-form estimates for the effects of wages on legislative performance for the 2005/2008 legislature. Municipal Characteristics include Log household income per capita, % urban population, Gini coefficient, % households with energy, % literate population, average wage in private and public sector in municipality, the number of hours the legislature functions per week and assistants per legislator. All regressions include a 3rd order polynomial in population along with a quadratic spline on the first cutoff. Wages and salary caps have been divided by 1000. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The excluded instrument is the salary caps.

Table 6. The Effects of Wages on Legislative Performance: Public Goods Provision

Dependent variable:	Education		Health		Sanitation		
	Number of schools per school aged child (x1000)	Some schools have science lab	Some schools have computer lab	Health Clinic	Number of doctors per capita (x1000)	Average number of doctor visits per household per year	Share of population with sanitation connections
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Panel A: IV estimates</u>							
Wages	0.328 [0.174]*	0.185 [0.031]***	0.134 [0.026]***	0.153 [0.033]***	0.355 [0.089]***	0.214 [0.050]***	0.017 [0.014]
<u>Panel B: Reduced-form estimates</u>							
Salary caps	0.217 [0.113]*	0.121 [0.020]***	0.088 [0.017]***	0.102 [0.022]***	0.233 [0.057]***	0.074 [0.021]***	0.012 [0.010]
Municipal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5004	5004	5004	4200	5059	5094	4155

Notes: The table reports the TSLS and reduced-form estimates for the effects of wages on legislative performance for the 2005/2008 legislature. Municipal Characteristics include Log household income per capita, % urban population, Gini coefficient, % households with energy, % literate population, average wage in private and public sector in municipality, the number of hours the legislature functions per week and assistants per legislator. All regressions include a 3rd order polynomial in population along with a quadratic spline on the first cutoff. Wages and salary caps have been divided by 1000. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The excluded instrument is the salary caps.

Table 7. The Effects of Wages on Political Selection

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Dependent variable	Years of schooling	No formal schooling	Some primary school	Primary school	Some high school	High school	Some college	College	High skilled occupation
Wages	0.495 [0.155]***	-0.023 [0.008]***	-0.016 [0.015]	-0.014 [0.012]	0.009 [0.008]	0.004 [0.016]	0.021 [0.007]***	0.017 [0.013]	0.043 [0.018]**
Observations	5091	5093	5093	5093	5093	5093	5093	5093	5093
Panel B: Dependent variable	Average terms of experience	1 term of experience	2 terms of experience	3 terms of experience	4 terms of experience	5 terms of experience	6 terms of experience	7 terms of experience	Male
Wages	0.154 [0.056]***	-0.047 [0.019]**	-0.007 [0.015]	0.03 [0.012]**	0.021 [0.008]**	0.005 [0.005]	0.003 [0.002]	0.000 [0.003]	-0.005 [0.010]
Observations	5093	5092	5092	5093	5092	5093	5093	5093	5093
Municipal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table reports the TSLS estimates of the effects of wages on political selection of 2005/2008 legislature. Municipal Characteristics include Log household income per capita, % urban population, Gini coefficient, % households with energy, % literate population, average wage in private and public sector in municipality, the number of hours the legislature functions per week and assistants per legislator. All regressions include a 3rd order polynomial in population along with a quadratic spline on the first cutoff. Wages have been divided by 1000. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The excluded instrument is the salary caps.

Table 8. The Effects of Wages on Legislative Productivity: Incentives versus selection

Dependent variable:	Number of Bills Submitted	Number of Bills Approved	Functioning Commission	Public events	Number of schools per school aged child (x1000)	Some schools have science lab	Some schools have computer lab	Health Clinic	Number of doctors per capita (x1000)	Average number of doctor visits per household per year	Share of population with sanitation connections
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A:											
Wages	0.662 [0.243]***	0.482 [0.132]***	0.064 [0.027]**	0.055 [0.035]	0.286 [0.178]	0.176 [0.032]***	0.132 [0.027]***	0.158 [0.034]***	0.31 [0.092]***	0.106 [0.033]***	0.017 [0.015]
Male	0.448 [0.229]*	0.289 [0.177]	0.004 [0.046]	-0.086 [0.055]	-0.309 [0.358]	-0.068 [0.057]	-0.008 [0.039]	-0.011 [0.064]	0.319 [0.129]**	-0.034 [0.059]	-0.032 [0.026]
Years of schooling	0.024 [0.020]	0.026 [0.010]***	0.002 [0.003]	0.009 [0.004]**	-0.024 [0.023]	0.013 [0.004]***	0.002 [0.003]	-0.004 [0.004]	0.05 [0.009]***	0.011 [0.004]***	0.006 [0.002]***
Terms of experience	0.006 [0.080]	0.049 [0.060]	-0.014 [0.008]*	0.012 [0.010]	0.136 [0.084]	0.000 [0.011]	0.007 [0.008]	-0.012 [0.012]	0.076 [0.028]***	-0.001 [0.010]	0.001 [0.004]
High skilled occupation	-0.069 [0.185]	-0.185 [0.110]*	-0.017 [0.028]	-0.024 [0.035]	0.652 [0.201]***	-0.012 [0.035]	-0.007 [0.025]	-0.012 [0.040]	0.112 [0.082]	0.021 [0.035]	-0.019 [0.016]
Panel B: Controlling for reelection rates											
Wages	0.653 [0.240]***	0.471 [0.132]***	0.067 [0.027]**	0.054 [0.035]	0.322 [0.181]*	0.171 [0.033]***	0.136 [0.027]***	0.157 [0.035]***	0.316 [0.091]***	0.101 [0.032]***	0.027 [0.018]
Male	0.449 [0.230]*	0.304 [0.178]*	0.004 [0.046]	-0.084 [0.055]	-0.351 [0.358]	-0.062 [0.057]	-0.012 [0.039]	-0.012 [0.064]	0.303 [0.130]**	-0.034 [0.059]	-0.032 [0.026]
Years of schooling	0.024 [0.020]	0.026 [0.010]**	0.002 [0.003]	0.009 [0.004]**	-0.019 [0.023]	0.013 [0.004]***	0.003 [0.003]	-0.005 [0.004]	0.052 [0.009]***	0.011 [0.004]***	0.006 [0.002]***
Terms of experience	0.007 [0.093]	0.075 [0.066]	-0.016 [0.009]*	0.015 [0.011]	0.056 [0.088]	0.011 [0.012]	-0.001 [0.008]	-0.009 [0.013]	0.045 [0.030]	0.001 [0.010]	0.001 [0.004]
High skilled occupation	-0.067 [0.183]	-0.17 [0.110]	-0.018 [0.028]	-0.022 [0.035]	0.59 [0.199]***	-0.004 [0.035]	-0.013 [0.025]	-0.009 [0.040]	0.09 [0.082]	0.023 [0.035]	-0.02 [0.016]
Municipal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3544	3544	5092	5092	5002	5002	5002	4199	5057	5092	4153

Notes: The table reports the TSLS estimates of the effects of wages on political performance of 2005/2008 legislature. Municipal Characteristics include Log household income per capita, % urban population, Gini coefficient, % households with energy, % literate population, average wage in private and public sector in municipality, the number of hours the legislature functions per week and assistants per legislator. The regressions in Panel B all include a 3rd order polynomial in the share of incumbents from 2001-2004 legislature that was re-elected in 2004. All regressions include a 3rd order polynomial in population along with a quadratic spline on the first cutoff. Wages have been divided by 1000. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The excluded instrument is the salary caps.

Table 9. The Effects of Wages on Political Entry: 2008 Elections

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>Panel A:</u> Dependent variable	Number of new candidates per seat	Number of new parties per seat	Number of major parties per seat	Number of small parties per seat	Log of campaign expenditures	Log of wealth	Share of high skilled occupation	Share of male
Wages	0.589 [0.269]**	0.038 [0.042]	0.114 [0.081]	0.589 [0.269]**	0.148 [0.058]**	0.156 [0.039]***	0.031 [0.007]***	-0.003 [0.005]
Observations	5086	5086	5086	5086	4980	5089	5094	5094
<u>Panel B:</u> Dependent variable	Years of schooling	No formal schooling	Some primary school	Primary school	Some high school	High school	Some college	College
Wages	0.532 [0.077]***	-0.01 [0.004]**	-0.036 [0.008]***	-0.007 [0.006]	-0.001 [0.003]	0.014 [0.007]**	0.01 [0.003]***	0.029 [0.005]***
Observations	5094	5094	5094	5094	5094	5094	5094	5094
<u>Municipal characteristics</u>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table reports the TSLS estimates of the effects of wages on political entry in the 2008 elections. Municipal Characteristics include Log household income per capita, % urban population, Gini coefficient, % households with energy, % literate population, average wage in private and public sector in municipality, the number of hours the legislature functions per week and assistants per legislator. All regressions include a 3rd order polynomial in population along with a quadratic spline on the first cutoff. Wages have been divided by 1000. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The excluded instrument is the salary caps.

Table 10. The Effects of Wages and Reelection Rates for 2004-2008 Legislature

Dependent variable:	Ran for reelection	Share reelected (unconditional)	Share reelected (conditional)	Share reelected among those with a college degree	Share reelected among those without a college degree	Average campaign expenditures
	(1)	(2)	(3)	(4)	(5)	(6)
Wages	0.007 [0.015]	0.031 [0.015]**	0.042 [0.018]**	0.060 [0.040]	0.021 [0.021]	0.132 [0.068]*
Municipal characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5093	5093	5083	3229	5074	4979

Notes: The table reports the TSLS estimates of the effects of wages on reelection rates of the 2005/2008 legislature. Municipal Characteristics include Log household income per capita, % urban population, Gini coefficient, % households with energy, % literate population, average wage in private and public sector in municipality, the number of hours the legislature functions per week and assistants per legislator. All regressions include a 3rd order polynomial in population along with a quadratic spline on the first cutoff. Wages have been divided by 1000. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The excluded instrument is the salary caps.

Table 11. Robustness Test – Functional form assumption

	Flexible municipal controls	Quadratic spline	Linear spline	5 percent quadratic polynomial	5 percent cubic polynomial	10 percent quadratic polynomial	10 percent cubic polynomial	10 percent linear spline	10 percent quadratic spline	Flexible control for federal block grant	Control for council size
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: Political performance											
Number of Bills Submitted	0.552 [0.224]**	0.787 [0.321]**	0.528 [0.391]	0.928 [0.384]** (426)	1.171 [0.526]** (426)	0.886 [0.311]** (702)	1.033 [0.416]** (702)	1.302 [0.590]** (702)	1.459 [0.735]** (702)	0.834 [0.263]**	0.678 [0.233]**
Number of Bills Approved	0.467 [0.118]**	0.618 [0.164]**	0.362 [0.242]	0.721 [0.183]** (426)	0.812 [0.270]** (426)	0.666 [0.141]** (702)	0.724 [0.211]** (702)	0.97 [0.274]** (702)	1.104 [0.382]** (702)	0.576 [0.140]**	0.529 [0.126]**
Functioning commission	0.054 [0.027]**	0.087 [0.034]**	0.102 [0.052]**	0.047 [0.024]* (555)	0.073 [0.040]* (555)	0.046 [0.020]** (922)	0.077 [0.036]** (922)	0.022 [0.032]	0.051 [0.054]	0.06 [0.027]**	0.065 [0.025]**
Number of schools per 1000 school aged children	0.312 [0.170]*	0.009 [0.202]	0.637 [0.351]*	-0.19 [0.140] (552)	0.018 [0.242] (552)	-0.032 [0.118] (913)	0.212 [0.216] (913)	0.045 [0.172] (913)	0.014 [0.369] (913)	0.161 [0.170]	0.269 [0.167]
Share of schools with a science laboratory	0.121 [0.026]**	0.099 [0.033]**	0.051 [0.047]	0.139 [0.028]** (552)	0.143 [0.025]** (552)	0.159 [0.048]** (913)	0.156 [0.040]** (913)	0.147 [0.045]** (913)	0.147 [0.045]** (913)	0.126 [0.078]	0.141 [0.028]**
Share of schools with a computer laboratory	0.178 [0.032]**	0.083 [0.041]**	0.099 [0.061]	0.153 [0.028]** (552)	0.172 [0.025]** (552)	0.168 [0.047]** (913)	0.211 [0.044]** (913)	0.103 [0.041]** (913)	0.103 [0.041]** (913)	0.066 [0.078]	0.193 [0.032]**
Health clinic	0.143 [0.032]**	0.067 [0.040]*	0.139 [0.068]**	0.116 [0.027]** (518)	0.142 [0.024]** (518)	0.151 [0.044]** (843)	0.168 [0.042]** (843)	0.104 [0.038]** (843)	0.113 [0.062]* (843)	0.160 [0.033]**	0.145 [0.032]**
Number doctors per 1000 inhabitants	0.357 [0.088]**	0.235 [0.110]**	0.426 [0.177]**	0.18 [0.088]** (551)	0.296 [0.163]* (551)	0.161 [0.076]** (918)	0.255 [0.137]* (918)	0.241 [0.136]* (918)	0.412 [0.241]* (918)	0.297 [0.092]**	0.335 [0.089]**
Panel B: Political selection of 2000-2004 legislature											
Years of schooling	0.56 [0.121]**	0.23 [0.174]	0.351 [0.241]	0.561 [0.107]** (555)	0.504 [0.179]** (555)	0.579 [0.094]** (922)	0.593 [0.166]** (922)	0.165 [0.155] (922)	0.03 [0.255] (922)	0.646 [0.126]**	0.553 [0.119]**
Average terms of experience	0.176 [0.047]**	0.145 [0.066]**	0.191 [0.087]**	0.156 [0.052]** (555)	0.193 [0.072]** (555)	0.164 [0.047]** (922)	0.199 [0.068]** (922)	0.04 [0.079] (922)	0.038 [0.106] (922)	0.167 [0.048]**	0.183 [0.044]**
Share from a high skilled occupation	0.041 [0.014]**	0.02 [0.018]	0.023 [0.027]	0.024 [0.013]* (555)	0.004 [0.022] (555)	0.032 [0.011]** (922)	0.021 [0.019] (922)	0.01 [0.020] (922)	-0.018 [0.033] (922)	0.038 [0.014]**	0.038 [0.013]**

Table 11. Robustness Test – Functional form assumption (continued...)

	Flexible municipal controls	Quadratic spline	Linear spline	5 percent quadratic polynomial	5 percent cubic polynomial	10 percent quadratic polynomial	10 percent cubic polynomial	10 percent linear spline	10 percent quadratic spline	Flexible control for federal block grant	Control for council size
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel C: Political entry in 2008 elections											
Number of new candidates per seat	1.5 [0.165]***	2.656 [0.071]***	0.557 [0.367]	1.993 [0.188]*** (561)	2.024 [0.297]*** (561)	2.075 [0.168]*** (955)	2.004 [0.268]*** (955)	1.169 [0.275]*** (955)	3.476 [0.567]*** (955)	1.578 [0.176]***	1.517 [0.162]***
Number of small parties per seat	1.5 [0.165]***	2.656 [0.071]***	0.557 [0.367]	1.993 [0.188]*** (561)	2.024 [0.297]*** (561)	2.075 [0.168]*** (955)	2.004 [0.268]*** (955)	1.169 [0.275]*** (955)	3.476 [0.567]*** (955)	1.578 [0.176]***	1.517 [0.162]***
Number of large parties per seat	0.169 [0.047]***	0.372 [0.020]***	0.15 [0.115]	0.184 [0.052]*** (561)	0.256 [0.078]*** (561)	0.244 [0.047]*** (955)	0.299 [0.072]*** (955)	0.111 [0.079] (955)	0.629 [0.136]*** (955)	0.174 [0.048]***	0.182 [0.046]***
Campaign expenditures among new candidates	0.211 [0.049]***	0.53 [0.019]***	0.306 [0.129]**	0.43 [0.051]*** (556)	0.182 [0.072]** (556)	0.45 [0.045]*** (938)	0.24 [0.066]*** (938)	0.404 [0.079]*** (938)	0.376 [0.043]*** (938)	0.256 [0.047]***	0.227 [0.047]***
Years of schooling of new candidates	0.514 [0.077]***	0.651 [0.029]***	0.407 [0.200]**	0.435 [0.073]*** (563)	0.413 [0.118]*** (563)	0.481 [0.063]*** (958)	0.473 [0.108]*** (958)	0.248 [0.109]** (958)	0.122 [0.204] (958)	0.523 [0.083]***	0.53 [0.076]***
Share from a high skilled occupation	0.03 [0.007]***	0.013 [0.003]***	0.028 [0.018]	0.016 [0.006]*** (563)	0.019 [0.010]* (563)	0.02 [0.005]*** (958)	0.023 [0.009]** (958)	0.017 [0.010]* (958)	0.021 [0.018] (958)	0.032 [0.007]***	0.029 [0.007]***
Average wealth among new candidates	0.165 [0.039]***	0.155 [0.015]***	0.222 [0.101]**	0.072 [0.035]** (562)	0.129 [0.057]** (562)	0.108 [0.033]*** (957)	0.184 [0.054]*** (957)	0.102 [0.060]* (957)	0.186 [0.099]* (957)	0.172 [0.040]***	0.157 [0.039]***
Panel D: Legislator behavior in 2008											
Share re-elected (unconditional)	0.029 [0.012]**	0.036 [0.019]*	0.056 [0.027]**	0.017 [0.010] (555)	0.000 [0.018] (555)	0.021 [0.009]** (922)	0.005 [0.016] (922)	0.049 [0.017]*** (922)	0.034 [0.027] (922)	0.021 [0.012]*	0.025 [0.011]**
Share re-elected (conditional)	0.032 [0.014]**	0.043 [0.022]*	0.073 [0.033]**	0.008 [0.012] (553)	-0.005 [0.021] (553)	0.011 [0.011] (920)	-0.003 [0.019] (920)	0.063 [0.019]*** (920)	0.064 [0.031]** (920)	0.015 [0.014]	0.027 [0.013]**
Campaign expenditures	0.207 [0.054]***	0.104 [0.090]	0.306 [0.129]**	0.428 [0.055]*** (541)	0.163 [0.086]* (541)	0.444 [0.047]*** (900)	0.209 [0.074]*** (900)	0.44 [0.080]*** (900)	0.101 [0.119] (900)	0.251 [0.054]***	0.221 [0.052]***

Notes: All regressions control for the full set of municipal characteristics. Column 1 also controls for a 4th order polynomial in all of the municipal characteristics. Column 2 controls for a 3rd order polynomial in population and allows for a quadratic spline in population on first-two cutoffs. Column 3 controls a piecewise linear spline on all cutoffs and uses the cutoffs as the excluded instruments. Columns 4-9 restrict the samples to either 5 or 10 percent above and below the cutoffs. Column 10 controls 4th order polynomial in the amount federal block grants and column 11 controls for the council size. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets.

Table A1. Robustness Test – Smoothness

	N	Coefficient on salary caps	F-statistic on cutoff indicators
	(1)	(2)	(3)
Private sector wages	5093	-0.016 [0.013]	0.99
Income per capita (logs)	5093	0.021 [0.031]	0.29
Share households residing in urban sector	5093	-0.015 [0.012]	0.96
Gini coefficient	5093	-0.006 [0.003]*	1.87*
Share of households with electricity	5093	0.002 [0.009]	0.47
Literacy rate	5093	0.084 [1.609]	1.53
Share of population with primary education	5093	0.004 [0.007]	0.72
Share of population with secondary education	5093	1.077 [0.904]	0.73
Has a television station	5093	0.242 [0.429]	0.39
Education level of the mayor in 2000	5093	-0.005 [0.014]	1.01
Age of the mayor in 2000	4644	0.013 [0.236]	1.85*
Mayor is in second term	5093	0.419 [0.543]	1.78
Male mayor	5093	0.02 [0.025]	0.89
Assistants per legislator	5093	-0.007 [0.015]	0.21
Hours legislative functions per week	5093	-0.011 [0.041]	1.08
Number of effective parties in legislative elections in 1996	5093	-0.031 [0.061]	0.30

Notes: The dependent variable is specified in each row. The regressions presented in Column 1 regresses the dependent variable on maximum salary a legislator can receive and a piecewise linear spline on population. The regressions presented in Column 2 regresses the dependent variable on the wage cutoff indicators. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The reported F-test refers to the cut-off indicators.

Table A2. The Effects of Block Grants on Political Selection and Performance

	F-test on Block Grant Indicators	
	Threshold 2 (1)	Threshold 3 (2)
<u>Panel A: Political performance</u>		
Number of Bills Submitted	0.56	1.18
Number of Bills Approved	0.46	0.79
Share of Bills Approved	1.66	0.33
Functioning commission	0.38	1.22
Public events	1.26	2.02*
Number of schools per 1000 school aged children	0.3	0.63
Share of schools with a science laboratory	0.36	1.63
Share of schools with a computer laboratory	0.53	1.01
Health clinic	0.48	0.87
Number doctors per 1000 inhabitants	1.95*	1.14
<u>Panel B:: Political selection of 2000-2004 legislature</u>		
Years of schooling	2.01*	0.96
Average terms of experience	0.28	0.14
Share from a high skilled occupation	0.83	0.36
<u>Panel C: Political entry in 2008 elections</u>		
Number of new candidates per seat	0.44	0.81
Number of new parties per seat	0.81	0.39
Number of small parties per seat	0.44	0.81
Number of large parties per seat	1.09	0.9
Campaign expenditures among new candidates	0.18	1.13
Years of schooling of new candidates	1.69	0.22
Share from a high skilled occupation	1.73	0.38
Average wealth among new candidates	0.2	0.7
<u>Panel D: Legislator behavior in 2008</u>		
Share re-elected (unconditional)	1.26	0.5
Share re-elected (conditional)	1.15	0.17
Share re-elected among college graduates	0.57	3.11**
Campaign expenditures	0.18	1.13

Notes: This table present OLS estimates for the effects of the block grant cutoffs on various characteristics of political selection and performance, for municipalities with a population of 10,108-44,148 (column 1) and for municipalities with a population 50,940 -91,692. Wages are constant in both segments. All regressions control for full set of municipal characteristics. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level. Robust standard errors are reported in brackets. The reported F-test refers to cutoffs.

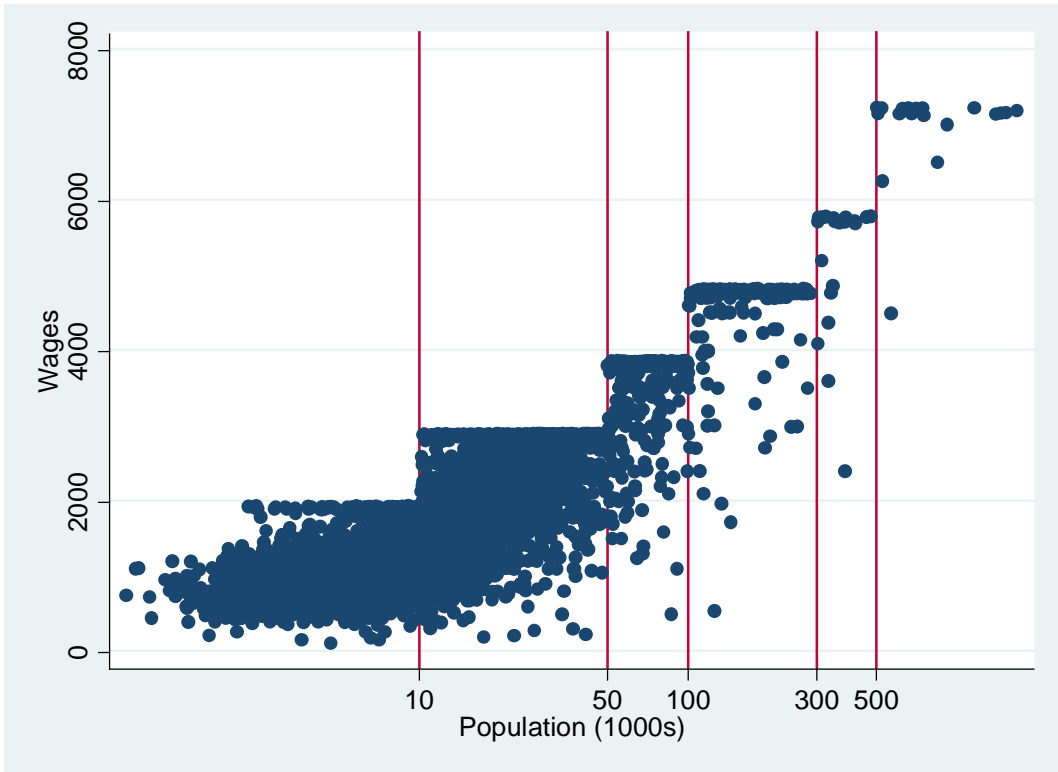


FIGURE 1: LEGISLATORS' SALARIES BY POPULATION

Notes: Figure shows legislators' salaries by population (in log scale). The vertical lines denote the various cutoff points.

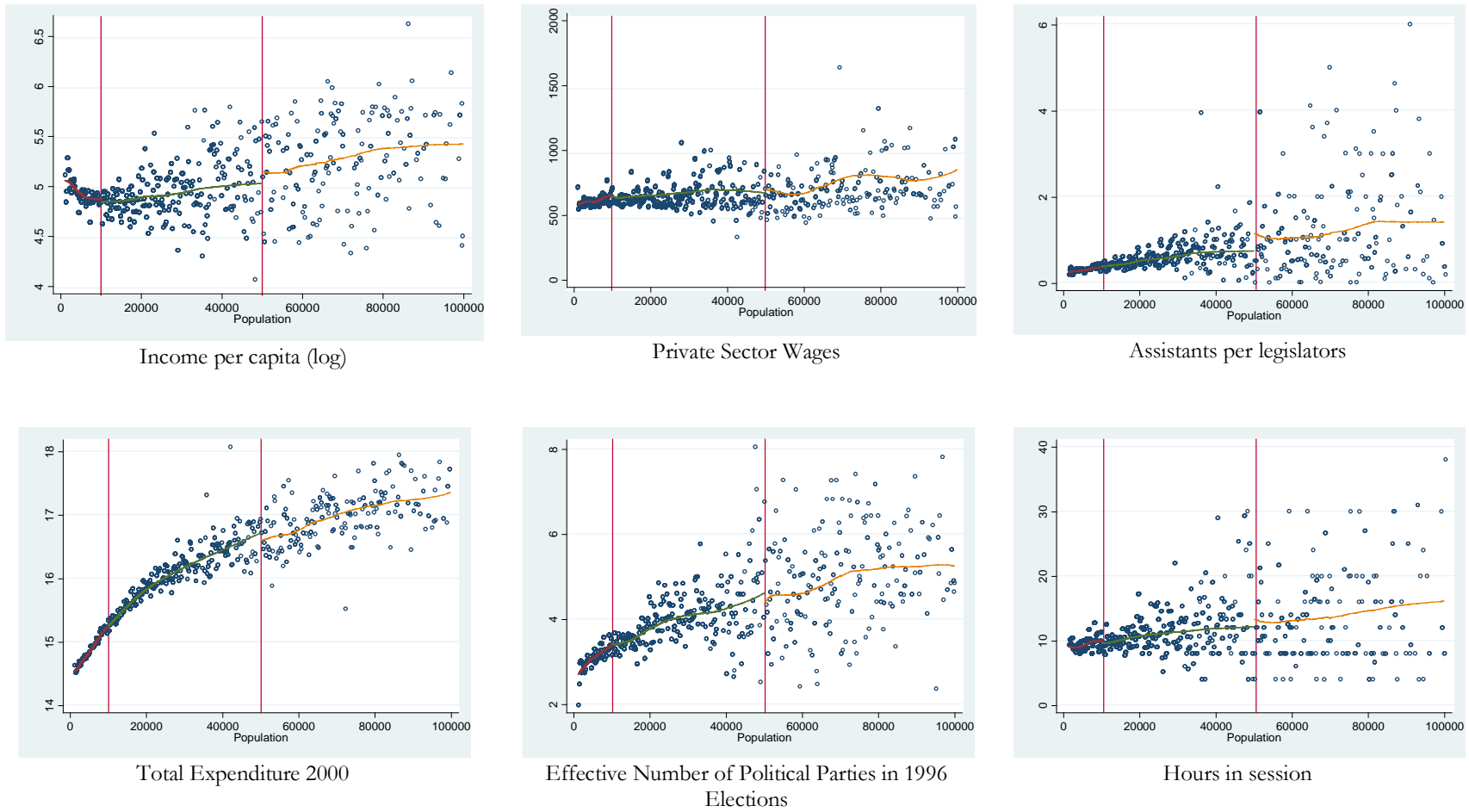


FIGURE 2: MUNICIPAL CHARACTERISTICS BY POPULATION

Notes: The figure shows municipal characteristics by population. Each figure presents the mean of the municipal characteristic for a bin size of 200 inhabitants (hollow-circles) along with a locally weighted regression calculated within each population segment with a bandwidth of 0.5. The vertical lines denote the various cutoff points.

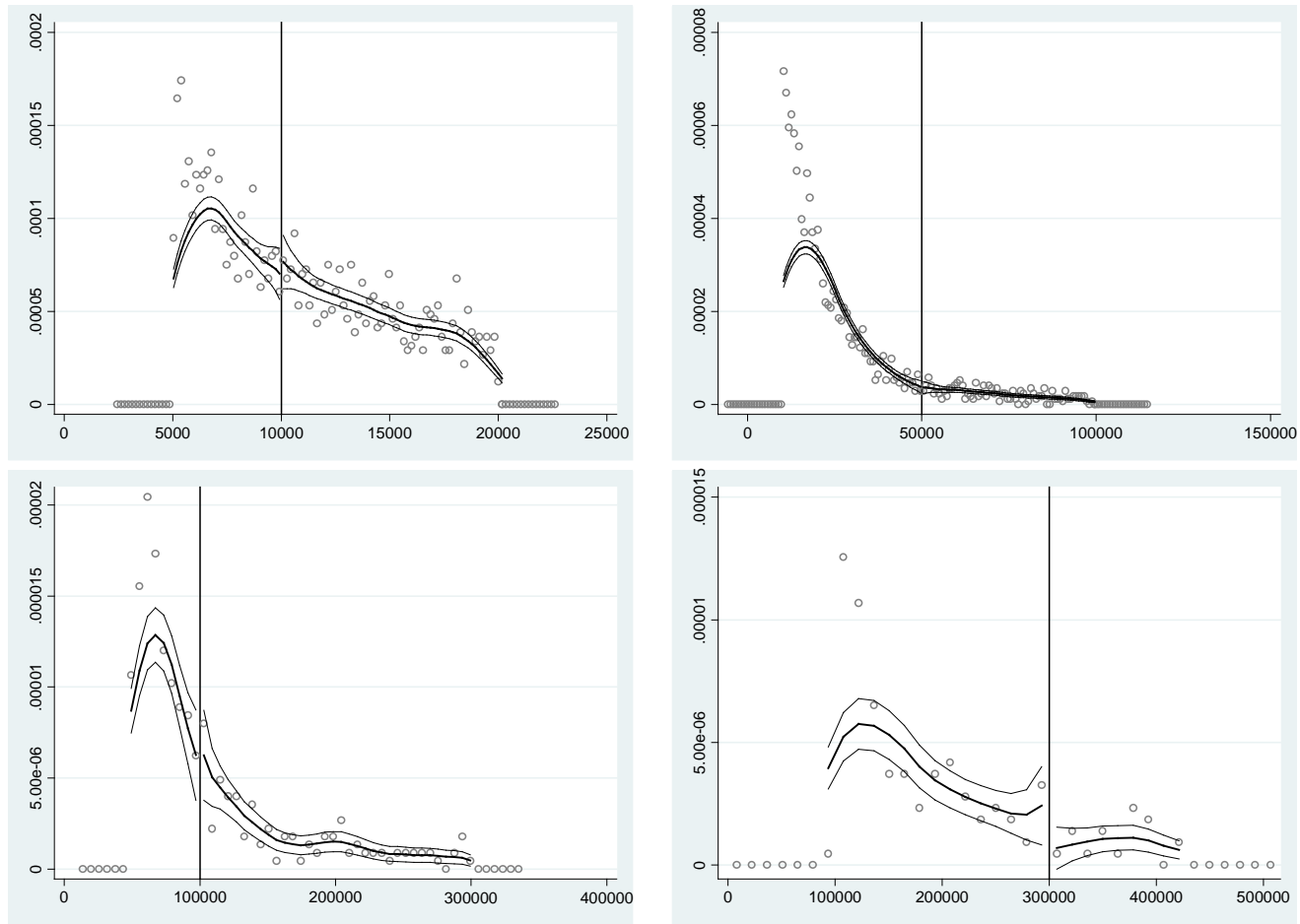
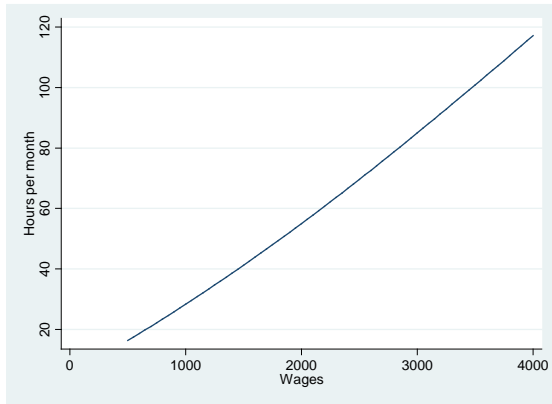
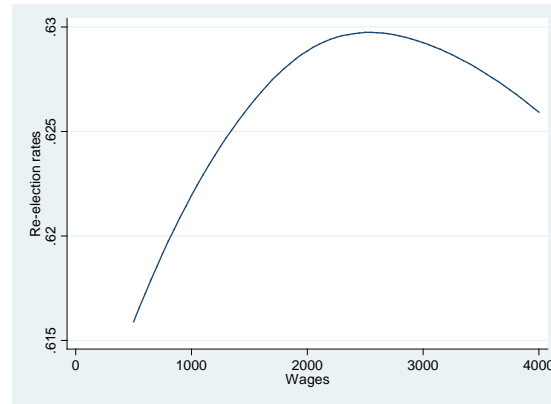


FIGURE 3: DISTRIBUTION OF MUNICIPAL POPULATION

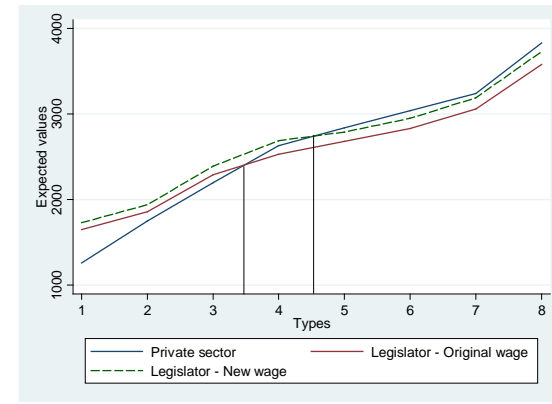
Notes: Figure shows the distribution of the population of each municipality in our sample for the four three cutoff points (denoted by vertical lines).



Panel A: Effects of Wages on Performance



Panel B: Effects of Wages on Re-election rates



Panel C: Effects of Wages on Political Entry

FIGURE A1: EFFECTS OF A WAGE INCREASE ON POLITICAL PERFORMANCE AND ENTRY

Notes: Figure shows the equilibrium outcomes of the model under the following functional form assumptions. Politician's utility: $(c_t, G_t) = \frac{c_t^{1-\alpha}}{1-\alpha} + \psi \log(G_t)$; Public Goods: $G_t = \theta(e_t^L)^\eta$; Probability function: $\pi_t = \Phi(\gamma_1 G_t - \gamma_2 w^L)$. The parameters values: $\beta = 0.9$; $\alpha = 0.2$; $\psi = 0.2$; $\eta = 0.3$. The value functions are computed separately for each type, θ , which we assume is uniformly distributed.

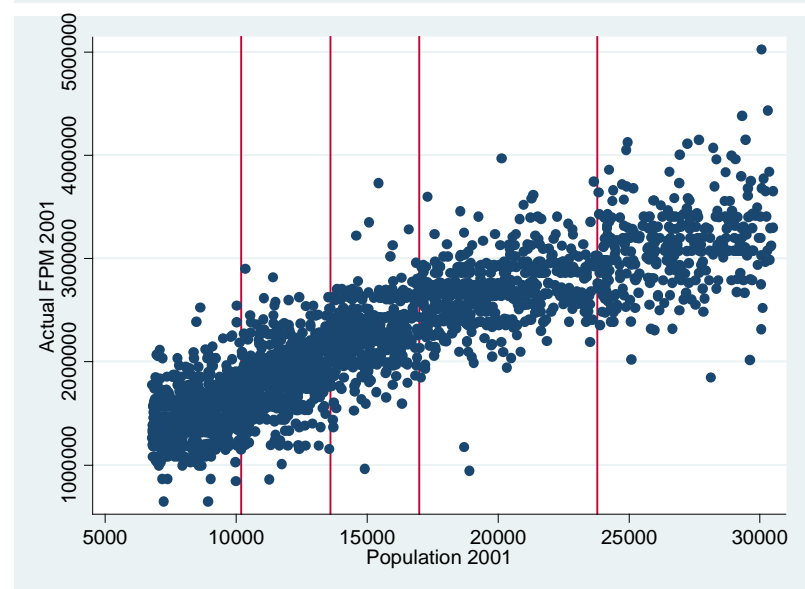
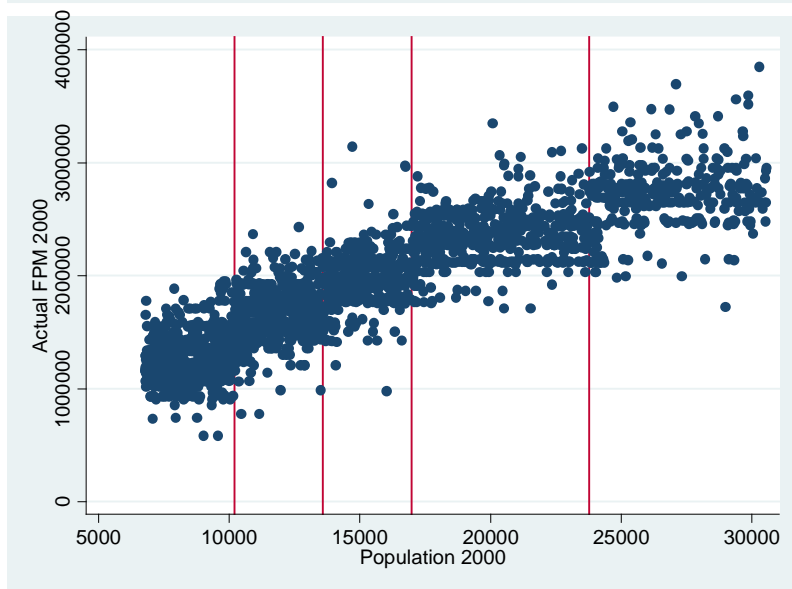
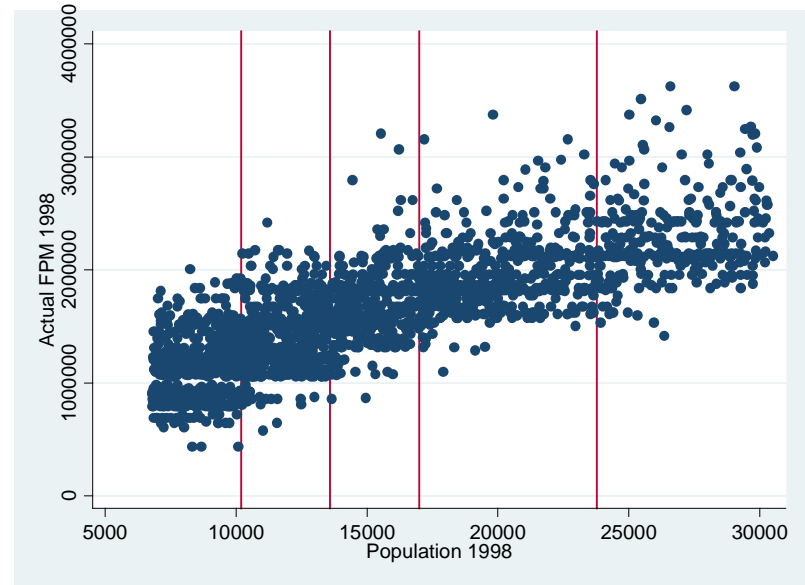
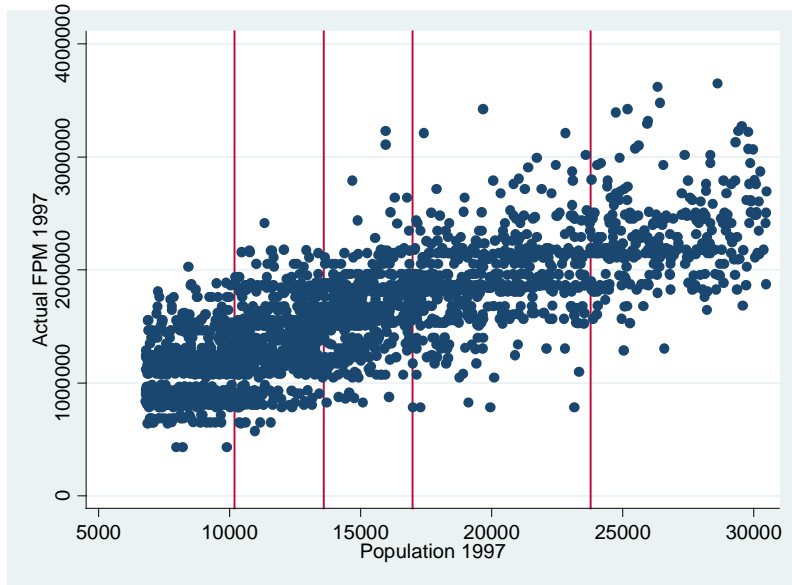


FIGURE A2: THE ALLOCATION OF BLOCK GRANTS BY POPULATION AND YEAR

Notes: Figure plots the relationship between municipal population and the actual amount of blocks grants received by the municipality. The vertical lines denote the population cutoffs for the block grants.

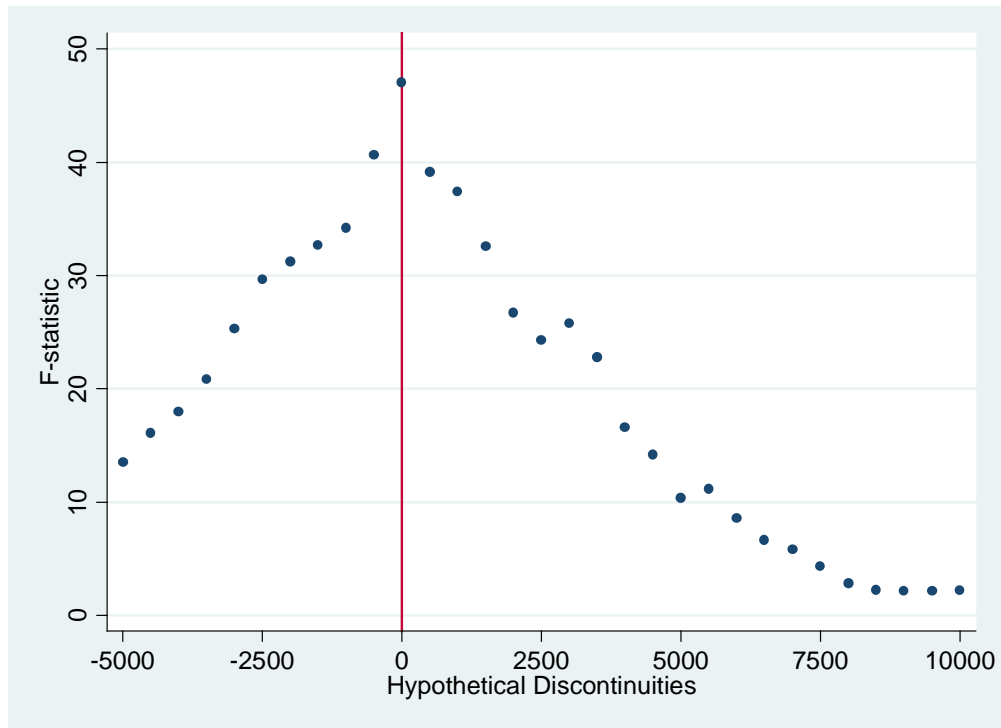


FIGURE A3: ROBUSTNESS CHECK OF DISCONTINUITIES

Notes: Figure plots the F-statistics computed on hypothetical population cutoffs that have been displaced by the amount indicated on the x-axis. The vertical line denotes the true cutoffs. Each regression controls for a linear spline in population.