

Are Politicians *Really* Paid Like Bureaucrats?

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Abstract

We provide the first empirical analysis of gubernatorial pay. Using US data for 1950-90 we document substantial variation in the wages of politicians, both across states and over time. Gubernatorial wages respond to changes in state income per capita and taxes, after controlling for state and time fixed effects. Our estimates suggest that governors receive a 1 percent pay cut for each ten percent increase in per capita tax payments and a 4.5 percent increase in pay for each ten percent increase in income per capita in their states. There is evidence that the tax elasticity reflects a form of "reward-for-performance". The evidence on the income elasticity of pay is less conclusive, but is suggestive of "rent extraction" motives. Lastly, we find that democratic institutions seem to play an important role in shaping pay. For example, voter-initiatives and the presence of significant political opposition lead to large reductions in the income elasticity of pay, and to large increases in the tax elasticities of pay.

Keywords: Politician pay, rent-extraction, pay-for-performance, democracy.

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In 2000, Prime Minister Goh Chok Tong of Singapore gave himself a pay increase of 14 percent, raising his already high salary to US\$1.1 million. This prompted some uncharacteristic murmurs of protest among Singaporeans regarding their leaders' salaries. Nonetheless, Prime Minister Goh received his raise, and encouraged Singaporeans to judge his government on its record for promoting economic competitiveness and its effectiveness in setting government policy (Webb, 2000). This suggests that, in practice, strong past performance make increases in pay more acceptable to public opinion. Singapore, however, is not a democracy, so its citizens had little recourse to prevent the pay increase from taking place. Hence, in this case, it is unclear whether this is an example of rent extraction by a leader insulated from democratic pressures, or reward for good performance. More generally, the question arises, are politicians paid for strong performance, or do they extract whatever salary and benefits are permitted by their circumstances? In this paper, we take advantage of variation in economic performance and democratic institutions across states and over time in the United States to address this important question in more general terms.

A traditional starting point in analyzing politicians' behaviors is that they are socially motivated. That is, in contrast to private sector managers, politicians are altruistic and do not care about monetary income. In this naïve view, one can ignore politician pay, as it is irrelevant: as long as politicians are able to subsist at a reasonable level, pay should not affect their actions. However, over the past few decades, economists and political scientists have considered more realistic formal models of political economy that incorporate factors such as those described in the opening paragraph. In these models, politicians no longer set out exclusively to maximize social welfare, but instead seek to also increase their chances of re-election, try to expand the sizes of the organizations they manage, and even accept bribes. However, once politicians have pecuniary motivations, a natural starting point in trying to understand their conduct is to study politician pay. The primary purpose of this paper is to take a first step in analyzing the officially sanctioned

financial compensation of politicians.¹

Economists often assume that public sector workers face flat pay schedules and low powered incentive schemes. A case in point is bureaucratic compensation.² Two explanations have been proposed, one based on the implication of multiple objectives of government bureaucracies and the other based on the idea that only informal incentives, i.e., career concerns, matter (see, for example, Tirole (1994); also Diermeier et al (2003)). Although we know of no fully-fledged model of politician pay, a reasonable first approach to these issues suggests that, as in theories of pay in bureaucracies, monetary payments would play a minor role and that we should expect to see little variation in the remuneration of politicians.³ Yet, in any particular year, there are large cross-state differences in the pay of political leaders in the United States. For example, in 1996, the most recent year for which we have data, the governor of the state of New York earned \$130,000, while the governor of Montana earned about \$55,000, and cross-sectional dispersion only increases as we look back in time. More importantly, there are also large differences in gubernatorial pay, in real terms, over time. Average pay for governors (in 1982 dollars) increased from \$48,090 in 1950 to \$80,037 in 1968; by 1994 it was down to \$58,738. Thus, contrary to popular belief, there is considerable variation in political compensation, both over time and across states. One of the contributions of the paper is to document these basic patterns that are present in the data.

We go on to analyze the relationship between the governor's wage and measures of state performance, using data for 48 states over the period 1950-90.⁴ Reports in the

¹ Ansolabehere, de Figueiredo, and Snyder (2002) show that there is little relation between campaign contributions and legislative votes, further underscoring the relevance of studying the role of official pay (as well as unofficial transfers, such as bribes) in providing incentives.

² The title of a recent paper on executive compensation is "Are CEO's really paid like Bureaucrats?" (Hall and Liebman, 1998). This paper takes as given that bureaucrats have low-powered incentives.

³ The arguments presented in Tirole (1994), for example, justify this statement.

⁴ While our paper focuses on the salaries of governors, it may potentially be interpreted as being about the pay of state elected officials more broadly defined. This would naturally suggest looking at a parallel set of results for members of state legislatures. However, this is complicated by the fact that compensation schemes of legislatures across states are not easily compared. Some legislatures are part-time, while others are full-time; some are compensated based on days in session, while others provide an annual salary. Moreover, these differences are not constant over time within each state. While we may control for these differences to some degree through a combination of state and part-time indicator variables, there remains considerable residual heterogeneity. We found in regression analogous to those reported below that the coefficients on lagged taxation and income were insignificant. However, given the variability in the nature of legislative duties and pay, we would not want to interpret the non-significance of these results as a rejection of the hypothesis that state elected officials are rewarded or punished by the public more broadly.

media suggest that politicians' pay is heavily influenced by economic conditions. For example, in the late 1980s, with the American economy in a recession, newspaper accounts described considerable opposition to politicians' attempts to increase their own wages. Thus, when Texas lawmakers announced their intentions to vote a wage increase in 1989, the *Houston Chronicle* responded with an editorial arguing that, "[w]hen the state's economy is still struggling and thousands of Texans are unemployed, lawmakers shouldn't expect much public sympathy over how little they are paid".⁵ We examine this possibility empirically, following the approach developed in the executive compensation literature and applying it to politician pay. We find that, after controlling for state and year fixed effects, there is a robust positive association between gubernatorial pay and state per capita income. The elasticity appears large, in excess of 0.4.

An alternative performance metric is state taxes. Peltzman (1992) presents theory and evidence consistent with the idea that taxes are set at a level that is higher than the level preferred by the median voter. Peltzman's theory of voters as fiscal conservatives also finds empirical support in the work of Matsusaka (1995), who shows that states that allow voter initiatives have lower taxes than "pure representation" states. This suggests that taxes may be used as a second measure of performance.⁶ There is ample anecdotal evidence suggesting that fiscal dynamics affect gubernatorial pay. For example, when California announced that its legislators and senior elected officials would receive pay increases in 1990, the *Los Angeles Times* published an article reporting that "[t]he action was expected to generate political fallout, coming in the wake of reports that the state is facing an estimated \$5 billion-plus budget shortfall in the current and coming fiscal years. The commission Friday sat through several hours of mostly hostile testimony from the public objecting to the increases".⁷ Our empirical results are consistent with this idea: there is a robust negative effect of taxes on the pay of state political leaders. Governors suffer a one percent pay cut for each ten percent increase in taxes per capita, or

⁵ Similar stories were reported in California during this period.

⁶ Taxes are also a measure of performance in "race to the bottom" theories where taxes are set too low as a result of competition between states. In this case, voters would reward increases in taxes.

⁷ Similarly, in Virginia in 1981, the *Washington Post* reported that the Virginia Senate was nearly successful in blocking a moderate wage increase for that state's governor, on the grounds that, "the pay raise would be unwise when the assembly already has voted down tax relief measures for the people." By far the most common element to newspaper reports complaining about governors' wage increases is that such increases are inappropriate at times when the state is struggling with a fiscal crisis.

equivalently, a one standard deviation increase in per capita tax payments brings about a decline of ten percent of a standard deviation in gubernatorial pay. Thus, governors get a similar pay increase if the income per capita of their voters increases by 1 percent or if they reduce per capita tax payments by approximately 4 percent.

Three alternative theories can explain the positive relationship between wages and income. First, we consider the simple possibility that voters increase gubernatorial pay when income increases in order to keep the governor's position constant in the state's distribution of income. We label this the "position" hypothesis. A second theory is that the public implicitly provides rewards for politicians to induce high effort in the design and implementation of good policies, as in a principal agent model. Since good policies are more likely to have been chosen when performance is strong, the public rewards the governor with higher wages when they experience higher incomes. This can be called "reward-for-performance". Finally, an alternative theory maintains that politicians are rent-seekers. In good times they take as much in wages as they can, constrained by the public's patience and the cultural stigma attached to greedy public servants. This may be called "rent-extraction". In contrast, of these three theories, a negative tax elasticity of pay can only reflect "reward for performance" motives. Further insight into the properties of the income elasticity of pay can be gained by considering the impact of forces that are beyond the governor's discretion that affect state income. Optimal incentive schemes should not incorporate such measures into compensation: they increase noise (for which the agent must be compensated) and do not improve effort. Hence, a "reward-for-performance" scheme predicts no correlation between any expected changes and the governor's salary. These various predictions are summarized in Table 1. Note that these are not mutually exclusive hypotheses, and we will report below that multiple channels seem to be operating in gubernatorial wage-setting.

In our empirical work, we differentiate among the explanations cited above first by looking at the effects of observable shocks unrelated to the governor's effort on gubernatorial salaries. The most obvious example is shocks to state income originating in observable movements in the aggregate economy. The evidence we present suggests that governors receive higher wages as a result of increases in income that originate in the aggregate economy, so the evidence is inconsistent with a "reward-for-performance"

motivation behind the income elasticity of gubernatorial pay under the assumptions that these shocks are cheap to observe. In contrast, and supporting the view that the tax elasticity of pay is influenced by reward-based considerations, we find evidence that forces beyond the governor's control that affect the revenue-raising requirements of the state government have no effect on gubernatorial pay. Furthermore, the strong correlation between taxes and gubernatorial wages derives primarily from the wage increases of governors that have been in office for more than a year. Collectively, this evidence suggests that voters (and legislatures) may, in fact, be rewarding governors for fiscal conservatism (or symmetrically, punishing governors for raising taxes).

In a firm, managers' wages are set, at least in theory, by the shareholders of the firm. Analogously, voters may be seen as ultimately setting the wages of politicians, and may have some scope to do so through various political institutions. Accordingly, we investigate whether "democracy" plays a role in controlling the rent-extraction activities of politicians. Theoretically, the literature considers three different methods of controlling politicians: elections, separation of powers and "direct" democracy. On the use of elections, Barro (1973) and Ferejohn (1986), amongst others, have made the point that accountability will be lower for politicians that do not expect to run again for office. On the separation of powers, Persson, Roland, and Tabellini (1997) and others, argued that opposing branches of government work by creating a conflict of interests between the executive and the legislature, thereby disciplining rent-seeking behavior by either party. Finally, on the role of "direct democracy", Frey (1994) and Matsusaka (1992, 1995) argue that institutions that allow for direct influence of voters within electoral periods introduce accountability.

We examine each of the preceding three channels empirically. First, similar to Besley and Case (1995), we exploit variations in gubernatorial term limits and re-election opportunities to provide some general evidence on the idea that elections promote government accountability. Second, we study if the separation of powers makes governors more accountable by examining how opposition in the state Senate affects the determination of gubernatorial pay. Finally, we examine whether gubernatorial pay is more closely tied to performance where citizens may directly control politicians. Specifically, we expect the aggregate-income elasticity of pay becomes smaller, and the

tax elasticity becomes larger, in voter initiative states. In these states voters do not have to rely on either of the mechanisms described above to control politicians.⁸ The data are strongly supportive of the latter two channels while they are inconclusive with regard to the first. One potential interpretation of these results is that citizens' initiatives and split government are more effective means of controlling politicians than re-election incentives.⁹

The results on democracy also help us rule out the hypothesis that the income elasticity can be explained by a desire to keep the governor at a constant position in the state income distribution. Under this hypothesis we would expect the positive aggregate income elasticity of pay to be *stronger*, not weaker, in states where democracy is working well to achieve desired policy outcomes, i.e., in states with voter initiatives and/or a strong opposition. Our results do not support this view.

To our knowledge, there is no previous published work on the empirical determinants of a politician's legal monetary income.¹⁰ There is a considerable body of research looking at a related margin: the impact of economic variables on the election probabilities of incumbent political leaders. An important literature has looked at the impact of economic events on political popularity, based both on actual votes and on popularity functions (see Fair (1978), Frey and Schneider (1978a), Alesina, Roubini, and Cohen (1997), Niemi, Stanley, and Vogel (1995), *inter alia*). In Frey and Schneider (1978b) it is explicitly argued that politicians may "consume" the pursuit of partisan objectives when they have a comfortable lead in popularity, i.e. when there are electoral rents. Closer to our paper is Besley and Case (1996), which examines the effect of state economic performance (relative to neighboring states) on the re-election probabilities of US governors. They find evidence in favor of the hypothesis that voters take into account information from neighboring states in what can be called a nexus of yardstick

⁸ The relevance of our results is perhaps independent of the question of gubernatorial pay. If one accepts the baseline results on the relationship between taxation, income, and gubernatorial pay, one can use the results on the role of democratic institutions to evaluate their effectiveness in controlling other areas of gubernatorial discretion that are less readily observable.

⁹ One potential concern with this conclusion may be that governors late in their terms have little incentive to push up their salaries, since they will only receive it for a very limited period. However, most governors' pension benefits are tied to their salaries during their last year in office, so this is unlikely to be important.

¹⁰ Groseclose and Milyo (2002) examine at the overall value of holding political office, but not its determinants.

competition. In a related contribution, Wolfers (2002) looks at the electoral performance of governors and finds that they are rewarded for luck, in the sense that exogenous positive shocks to state income increase the likelihood of re-election. More generally, we share with Besley and Case (1996) and Wolfers (2002) an interest in studying data generated in political markets using the techniques and ideas of the recent executive compensation literature. As well, our work ties into the literature on executive compensation (e.g., Jensen and Murphy (1990)).

The rest of the paper is structured as follows: Section I outlines a simple model to capture the intuition described in our introduction. Section II describes the paper's empirical strategy, while section III describes the data and its sources. Section IV presents our empirical results and section V concludes.

I. Gubernatorial Pay: Background and Model

Ia. Institutional Background

Until recently, governors' salaries were determined almost exclusively by legislative statute, thereby requiring approval of the legislature (See Book of the States, various years, for further details). Increases were generally not automatically adjusted for inflation, so that any salary increase required the consideration of state's legislative bodies. Several states have recently shifted to salary-setting by independent salary commissions, but only after our sample period ends. Moreover, the effect of this shift is unclear: while it was intended to create bodies that would objectively evaluate the governor's pay, this has not always been the case. For example, in California, where the governor's salary is now set by an 'independent' commission, the governor appoints all members of the salary commission. Recently, this has brought about concerns regarding the true independence of the commission, and has led to calls for a return to salary setting by legislative statute.

There is one notable exception to salary-setting by legislative statute that is particularly important for our paper: on a number of occasions, citizens' initiatives have been used to directly control the salaries of legislators. For example, a 1966 voter initiative in California set a limit on the salary increases that public officials could

approve for themselves. In Oregon, a 1962 initiative gave legislators the power to increase their own salaries, while a very recent initiative in that state has been put forward to repeal the 1962 amendment (Law, 2001).¹¹ Note, however, that citizens' initiatives need not *directly* impact salaries to act as a restraining force: to the extent that it gives voters greater bargaining power vis a vis politicians, it may indirectly affect the outcome of the salary bargaining game.

I.b. Theoretical Background

According to the previous section, while a state's citizens cannot directly control the governor through the setting of his salary during the period under consideration, they are able to do so indirectly through their control over the legislature. We may therefore model the setting of the governor's salary as the outcome of two factors: the governor's ability to co-opt the legislature, and the electorate's ability to compel the legislature to set the governor's salary appropriately, based on its preferences.

Hence, we model gubernatorial wages as being determined by the following process:

$$w_{it} = \phi R_{it} + (1-\phi) P_{it} + \eta_i + \lambda_t + \varepsilon_{it}$$

where R denotes the wage obtained by the governor through his/her efforts in lobbying the legislature (typically the Senate), while P denotes the wage chosen by the public; ϕ is the weight of lobbying by the governor in the final wage, η_i is an effect specific to the state, λ_t is a shock common to all states that may affect pay, and ε_{it} is an idiosyncratic shock. The main difference between the two parts of gubernatorial compensation is that the governor acts as Stackelberg leader on R while the public acts as leader on P .

The base hypothesis, suggested by our title, is that the politician is paid like a bureaucrat. That is, there is no expected correlation between gubernatorial pay and

¹¹ A case played itself out in Massachusetts recently that is of particular interest for our paper. In 1995, voters petitioned to have included on the ballot an initiative that would have reduced legislative salaries, but the Massachusetts Supreme Court disallowed the initiative. Political activists several years later tried to resurrect the movement, prompting an opinion piece in the Boston Herald, suggesting that the activists concentrate on getting the state legislature to pass a tax reduction bill (Anderson, 1999); this is explicitly the type of tradeoff that we try to model in the theory section below.

economic variables, either because of broader social concerns, or because they expect to make much more money in the future (in the lecture circuit or through employment as lobbyists).

Rent-Extraction: The Politician as a Hunter

The rents obtained by the governor are assumed to depend on the effort exerted by the governor in this endeavor and by the availability of funds to meet the governor's wage demands. We will refer to this as the 'rent-seeking' hypothesis. The setup is one where holding the office of governor gives one access to a pool of funds; the salary that the governor is able to extract depends on the effort he exerts in lobbying the legislature, and the level of funds available, just as a hunter's catch depends on the effort exerted in hunting and the amount of game in the area. When income is high there is less chance of a public revolt against a governor that grabs a larger salary for himself. So, the governor exerts effort to maximize $R(e,s)-e$ where e is the governor's lobbying effort and s is the availability of funds. Assume that $s=ty-x$ where t is the tax rate, y is taxable income and x is the level of expenditures. The wage is fully characterized by the following first order condition

$$R_e - 1 = 0$$

where subscripts denote derivatives. It is reasonable to assume that there are decreasing returns to the governor's efforts and that the availability of funds makes lobbying efforts more productive. It is then direct to argue that the part of the wage determined by rent extraction is positively related to income and the tax rate because

$$\frac{dR}{dy} = \left(-\frac{R_e R_{es}}{R_{ee}} + R_s \right) t > 0 \quad , \quad \frac{dR}{dt} = \left(-\frac{R_e R_{es}}{R_{ee}} + R_s \right) y > 0$$

Position and Reward: The Public in Charge

The second part of the governor's wage is determined by the public in its attempt to control and reward the governor (indirectly through the legislature). We divide this into

two components. In the first, the public is not attempting to provide incentives, but would still like to keep the governor's wage in line with income in the state. This may be due to a desire to have the governor not suffer relative to the rest of society, or to continue to be able to attract the same pool of individuals into politics. If wages were not increased with income, the governor's wage would not keep its position in the distribution of state income. We refer to this as the 'position' hypothesis; it plays a similar role to a participation constraint in a standard principal agent model. According to the position hypothesis, the public component of the governor's wage, P , is simply indexed to state income,¹² so that:

$$\frac{dP}{dy} = 1 > 0 \quad , \quad \frac{dP}{dt} = 0$$

The second component captures the idea that the public wants to reward good performance. Both a standard principal agent model and a simple "fair" compensation game give similar results. We focus on the latter as it is simpler and more closely follows the intuition outlined in the introduction. We refer to this as the 'reward' hypothesis.

The public's objective is to give the governor a fair wage in order to compensate him for his effort (denoted E) in providing for the public's welfare. This target "fair" wage, P^* , depends positively on the probability that the governor has exerted high effort, q . Gubernatorial effort affects performance; income is therefore given by $y_i(E, y_{-i}, \varepsilon_1)$ where y_{-i} is an observable shock to income unrelated to the governor's effort and ε_1 is an unobservable shock. The tax rate is given by $t_i(E, t_{-i}, \varepsilon_2)$ where t_{-i} is an observable shock to taxes unrelated to the governor's effort and ε_2 is an unobservable shock.

The problem of the public is now to set wages P , to minimize a loss function over the difference to the public's fair wage, given by:

$$\text{Min}_P \quad (P^*(q) - P)^2$$

such that

¹² Note that when taxes are assumed to reduce the governor's net wage, the Position hypothesis predicts that higher taxes should be *positively* related to gubernatorial salaries.

$$q(Y = y - \hat{y}, T = t - \hat{t})$$

where \hat{y} and \hat{t} are the best predictors of income and taxation given all available information, and Y and T are the income and tax surprises respectively. The probability that the governor exerted effort above normal levels is positively correlated with positive income surprises. By contrast, q falls when taxes are unexpectedly high. Thus, we have¹³:

$$\begin{aligned} \frac{dP}{dy} = P_q^* q_Y > 0 \quad , \quad \frac{dP}{d\hat{y}} = -P_q^* q_Y < 0 \quad , \quad \frac{dP}{dy} + \frac{dP}{d\hat{y}} = 0 \\ \frac{dP}{dt} = P_q^* q_T < 0 \quad , \quad \frac{dP}{d\hat{t}} = -P_q^* q_T > 0 \quad , \quad \frac{dP}{dt} + \frac{dP}{d\hat{t}} = 0 \end{aligned}$$

where the third expression in each line shows that changes in performance that are fully expected should result in no changes in pay. For simplicity, the model ignores the possibility that the public actively tries to offset any rent extraction allowed by the legislators.

In summary, the three separate competing models on pay-setting that we have outlined have different empirical predictions. We refer the reader once more to Table 1, which highlights the distinctive predictions of these models.

We emphasize, in particular, that the ‘reward’ hypothesis is the only one that predicts a negative relationship between higher taxes and gubernatorial wages. Furthermore, the reward hypothesis distinguishes between expected and unexpected changes, while the others do not. Finally, while both the rent-seeking and position hypotheses predict a positive relation between state income and gubernatorial wage, we note that increasing ‘democracy’, i.e., decreasing ϕ , will shift the emphasis towards pay dynamics governed by the public pay setting models (Position and Reward). This will provide us with another opportunity to differentiate among the competing theories when shocks to income are expected: if the ‘position’ hypothesis dominates, then increased

¹³ Similar results obtain if a principal-agent model is used. In general, the principal will not want to make compensation depend on shocks that can be observed over which the agent does not have control. This would include noise (for which the risk averse agent must be compensated) and it does not improve the incentives for the agent.

democracy should lead to an increased income elasticity of pay. By contrast, the rewards hypothesis predicts that greater democracy will bring the expected-income-elasticity of pay towards zero.

II. Empirical Strategy

Our empirical strategy proceeds in three stages. First we estimate the performance elasticity of governor's pay. We then evaluate whether this evidence favors our reward, position, or rent-seeking models. Lastly, we check whether democracy limits the amount of rent-extraction; this further allows us to differentiate among the various models.

The basic regression takes the form:

$$Wage_{it} = \alpha Perform_{it-1} + \beta Controls_{it-1} + \eta_i + \lambda_t + \varepsilon_{it}$$

where $Wage_{it}$ is the log of the governor's wage in year t and state i , $Perform_{it-1}$ is a measure of performance such as the *Log of Income per Capita* or the *Log of Tax Payments per Capita*, $Controls_{it-1}$ is a set of controls that include the governor's age and the state's total population, η is a state fixed effect, λ is a year fixed effect and ε is an i.i.d. error term (note that our performance and control variables are lagged one year to better reflect the idea that bureaucratic wages react to past performances). This coefficient can then be compared to those obtained in similar regressions in the literature on executive compensation, as well as comparable regressions that use bureaucratic wages as the dependent variable.

A first, simple test is provided by examining regressions of the determinants of the state Health Commissioners' pay. The strategy is to examine the pay of the member of the executive branch whose effort is least likely to affect our performance outcomes, income and taxation. Accordingly, a rewards model for this individual would predict that his/her pay should not be based on these factors.

A second approach is to investigate whether the governor's pay is correlated with the component of state per capita income that is beyond the control of the governor. The rewards model predicts that this element of income should be uncorrelated with

compensation, while both the rent-seeking and position models predict a positive correlation. Recent empirical work in executive compensation has focused on this feature of principal agent models that parallel the one we describe in Section I (see, for example, Aggarwal and Samwick (1999); see Wolfers (2002) for an application of the same techniques to gubernatorial elections). Since we are interested in a similar set of questions related to politician pay, we closely follow their approach. This consists of re-estimating regression (1) with two-stage-least-squares techniques using the log of average personal income for the state's geographic neighbors (*Log of Neighbors' Income*). Under the assumption that *Log of Neighbors' Income* is cheap to observe, and presumably reflects a regional shock that cannot be attributed to the governor's performance, it should not affect pay under a rewards model. Including it would increase the risk faced by the politician (and hence average pay) and would not improve his/her incentives to provide effort. In other words, the hypothesis is that once instrumented, this part of the state's income should not affect politician pay.¹⁴ Both rent extraction and position models predict a positive correlation.

An exactly analogous approach may be followed in looking at shifts in taxation that are beyond the control of the governor: we use tax payments of adjacent states (*Log of Neighbors' Taxes*) as a summary statistic for regional shocks to demographics, economic circumstances, and region-specific policies that would impact the revenue-raising requirements of a state. As in the two-stage-least-squares regressions for income, if governor compensation is governed by the rewards model, once instrumented, tax levels should have no impact on pay.

In the final section of the paper we test whether democracy, broadly conceived, limits the rent-extraction activities of politicians and intensifies the elements of public pay-setting.¹⁵ First, we study the disciplining role of elections. Similar to Besley and

¹⁴ Another possible source of exogenous variation, utilized by Wolfers (2002), is the interaction of the price of oil with industry shares in each state (see Wolfers (2002) for a rationale of their use as instruments). Using this set of instruments yields even larger coefficients from state income than those reported in Table 3(B). Results available upon request. We thank Justin Wolfers for kindly providing us with the oil price and industry share data.

¹⁵ There already exists a very substantial literature on the role of democratic institutions in shaping politicians' behaviors, particularly in the area of fiscal performance. In addition to the citations discussed in the main body of the text, some recent contributions include: on the role of re-election incentives, Rothenberg and Sanders (2000) and Lowry, Alt, and Ferree (1998); on divided government, Poterba (1994) and Alt and Lowry (1994); and on voter referenda, Feld and Matsusaka (2001).

Case (1995), we check for different behavioral responses of our basic model when governors can seek re-election, versus situations when they are unable to do so as a result of term limits. In particular, governors facing re-election may be less inclined to seek wage increases, lest it become an election issue.

Second, we check if the income and tax sensitivity of gubernatorial pay is affected when the opposition party controls the state Senate. The idea is that the public makes pay decisions through its elected officials, and that opposition parties will be more effective in their control functions than same-party officials. Since the state Senate is the final arbiter on matters of gubernatorial pay decisions, we focus on the role of this section of the legislature. Our reasoning here is precisely analogous to the idea of the co-opting of a board of directors by a CEO: If the board is filled with allies, there will be fewer constraints on the CEO's ability to set his own wage (see, for example, Newman and Moses, 1999).

Finally, we look at the effect of voter initiatives on the performance elasticity of pay. Our hypothesis is that in voter initiative states, where policy is more directly shaped by voters, we should observe a greater weight on the public pay-setting components of our model. This perspective on voter initiatives is outlined in Frey (1994) and Matsusaka (1995), which describe the process by which voter initiatives facilitate the flow of information to the electorate, and prevent the formation of political coalitions to extract rents from the public. Empirically, Frey and Stutzer (2000) presents evidence that suggests that the electorate is happier in Swiss cantons that allow for direct democracy.¹⁶

III. Basic Description of the Data and our Sources

Our basic outcome variable, the level of pay of state governors, is taken from the *Book of the States*, a publication of the *Council of State Governments*.¹⁷ Since this is only a

¹⁶ We also examined the effect of various aspects of gubernatorial decision-making power on governor's pay sensitivity. In particular, we examined the effect of line item veto power, control over the budget process, and appointment powers. We did not find any consistent effect of these powers, and a composite measure of gubernatorial powers did not produce any significant effect. This may be a reflection of the fact that the power vested in the governor's office is more a function of personal factors, such as charisma, than official powers. This is a point emphasized by Beyle (1999).

¹⁷ Governors do receive other forms of compensation as well, such as the use of the governors' mansion in most states. We focus on salary since this is what is most readily observable and comparable across states,

biannual publication, our regressions are limited to observations from even years. This publication has comprehensive coverage of the wages of senior elected officials and bureaucrats from each state, and was also the source of our wage data for the Health Commissioner for each state. To put these data into real terms, we deflated using the *Bureau of Labor Statistics*' consumer price index for urban consumers (1982 = 100). We also collected data on the average wage of a bureaucrat in each state, taken from the *Statistical Abstract of the U.S.*¹⁸

We use two 'performance' measures. The first is the log of state personal income per capita (again, in 1982 dollars), taken also from the *Statistical Abstract of the U.S.* Our second measure of performance is taxation, which we measure using the log of total state taxes per capita (income + sales + corporate).¹⁹ Since these data are all available annually, we are able to use tax and income data from odd years, between the two pay observations, which should better reflect pay reactions to 'performance', rather than contemporaneous relationships.²⁰

A number of covariates will also be important in the specifications below. In particular, a common finding from the CEO pay literature is that compensation is highly correlated with organizational size, presumably because of the greater skills required to manage a larger and more complex firm. A parallel argument also applies in the case of governors: The cross-sectional correlation between state population and governor's wage is very high (equal to 0.63 for 1990). Since population also tends to be correlated with income and wealth, it will be important to include state population as a control.²¹ Life-

and we assume that it constitutes the bulk of gubernatorial compensation. Analogous difficulties exist in looking at CEO compensation; see, for example, Hall (2000).

¹⁸ Unless specified, all data below are taken from the *Statistical Abstract of the U.S.*

¹⁹ Using log of taxes allows for a readier interpretation of the coefficient on the tax term. Using tax rates, or detrended tax payments, yields similar results. Also, note that all of our results are somewhat stronger if corporate taxes are excluded; we include corporate taxes in order to be consistent with previous work (in particular, Besley and Case, 1996). As well, we obtained data on local property taxes from the *Statistical Abstract of the U.S.*, which allowed for their inclusion in our overall measure of taxation. It reduced both the precision and magnitude of the implied tax effect; when the log of property taxes per capita was included as a separate regressor, its coefficient was very close to zero and insignificant.

²⁰ The results are similar, though slightly weaker, if we include contemporaneous values or two year lags. When both contemporaneous and lagged values are included simultaneously, the lagged effects from *both* variables dominate. When one year and two year lags are included together, none of the coefficients are significant, due to colinearity.

²¹ One could equally well argue that organizational size would be better reflected by the size of the government bureaucracy, as measured by expenditures or employees. Using these alternatives does not change any of the results reported below.

cycle considerations might also be important for the governor in seeking pay increases; hence, we also collected data on governors' ages, taken from the *Book of the States*. To further probe the issue of whether compensation comes from rent-seeking or reward for performance, we also define a variable, *In Power* ≥ 2 , that takes on a value of one in year y if the governor had been in office in year $y-2$, i.e., the previous observation in our biannual data set.

Our section on the role of democracy in controlling the rent-seeking of politicians will require additional data on the political situation in each state. To examine the alignment of the governor with other politicians in the state, we define *Opposition* as a dummy variable that takes on a value of one if the governor's political party holds less than a majority (i.e., 50 percent) of seats in the state Senate.²² A related hypothesis looks at the disciplining effect of elections; for this, we define the variable *Lame Duck*, which takes on a value of one the governor is prohibited by law from standing for reelection.

Finally, to examine differences in pay sensitivity in states with and without voter initiatives, we define the dummy variable *Voter Initiative* to take on a value of 1 if legislation could be made through voter referenda in that state-year (See Matsusaka (1995) for details). Only 3 states approved voter initiative legislation between 1950 and 1990, so there is very little within-state variation.

In order to maintain a consistent sample over time, and to be consistent with previous work, we limit our coverage to the 48 states that were already in existence in 1950 (i.e., we exclude Alaska and Hawaii). In order to utilize the tax data of Besley and Case (1996), our series ends in 1990. Since, as mentioned above, we only have biannual observations for our wage data, we are limited to looking at even years.

Before proceeding to our regressions, it will be instructive to examine the basic patterns present in our data, since so little quantitative work has looked at politician pay. Table 2A shows gubernatorial wages, by state, for 1950 and 1990, in 1982 dollars. The median wage over this period shows an increase of only about 26 percent, from 48,090 to 60,436, while real average bureaucratic wages increased by 112 percent over the same

²² This variable is not defined for Nebraska, and for some observations for Minnesota.

time period.²³ It is also striking to note that, while the average increased during 1950-90, the variance across states actually declined by almost half (from \$21,108 to \$12,850), indicating a very strong convergence of wages during the period. In Table 2B, we list the state-year observations with the ten highest gubernatorial salary increases in our sample, by state-year. Associated with each salary increase, we report the lagged change in the log of taxation and income per capita, as well as the sample averages for that year. We observe that these large salary jumps came in years when those states experienced relatively high income growth and tax reductions. We will look in greater generality at the relationships among these variables in our regressions below.

Figure 2A shows the median level of annual wages of our three types of government officials for each year during 1950-1990, in 1982 dollars. Perhaps not surprisingly, there is considerable co-movement in the wages of the governor and the Health Commissioner.²⁴ However, note that these results reflect only medians; as we will see below, there turn out to be important differences between the compensation of governors and other public officials. Furthermore, *changes* in wages are not as highly correlated: the correlation between changes in gubernatorial wages and changes in the wages of Health Commissioners is only about 0.15. Similarly, detrended wage data are only weakly correlated. It is also worth noting that there is much greater smoothness in average bureaucratic wages over time. This is not surprising, since it reflects a pooling of all individuals in state governments, and also might reflect less stickiness in wages.

There are frequent changes in gubernatorial salaries, with nominal changes occurring in nearly half of the sample. However, it is also interesting to observe that there are periods over which governors' wages decline in real terms: There are almost no nominal declines in wages (only 6 of any magnitude in our data, one of which is accounted for by the Massachusetts governor donating a third of his wage to charity), but there were many periods during which wages remained constant or increased at a rate lower than inflation. This is illustrated in Figure 2B, which shows the median level of government officials' wages in nominal terms.

²³ Other top state officials experienced pay increases that, while somewhat lower than the average bureaucratic rate of increase, were far higher than those of the governors. For example, average treasurer wages increased by 64 percent, and average Health Commissioner wages increased by 68 percent.

²⁴ More generally, we find that the wages of constitutional officers and senior bureaucrats in each state move together.

We further investigate the timing of gubernatorial wage increases in Figures 3A-D. In Figure 3A, which shows the average percent change in governors' real wages over the preceding two years, it is apparent that wages in the latter part of the period under study increased, for the most part, every four years, thereby yielding the sawtooth pattern illustrated in this figure. The peaks in the figure coincide with years in which there had been recent gubernatorial elections in most states. Thus, when the sample is split into governors approaching the ends of their terms, versus governors that were recently elected to office, the sawtooth pattern disappears (see Figures 3B and 2C). Moreover, when we look at the difference between these two groups, we find that wage increases are uniformly much higher for governors not facing imminent elections. While these results are suggestive of certain political economy explanations described above, we will defer further interpretations to the results section below, where we may examine these patterns while appropriately controlling for other factors. Finally, we list the summary statistics for our data in Appendix B.

IV. Empirical Results

IV.a. Basic Estimates of the Performance-Elasticity of Pay

In this section we estimate the basic relationship between the log of the governor's wage and two measures of performance. The first is the (log of) personal income per capita. Regression (1) in Table 3A, shows the simplest specification. The coefficient on income per capita is positive and comfortably significant. This, as well as further evidence presented below, does not favor the hypothesis that politicians are paid like bureaucrats. A ten percent increase in income per capita is associated with a 4.5 percent increase in the governor's wage. This elasticity appears large: to a first approximation it is almost twice as large as estimates obtained in the CEO compensation literature (see, for example Murphy (1999) and Table 4 in Hall and Liebman (1998)), in looking at the sensitivity of pay to share price.²⁵ Of course, the elasticity appears to be small if the metric used is the amount of income going to the governor as a proportion of each extra dollar generated for

²⁵ Note, however, that this elasticity is dependent on the time period chosen as pay elasticities have increased over the past few decades. Also note that the dependent variable in Hall and Liebman (1998) is changes in wealth, which is somewhat analogous to levels in income.

the state. Regression (2) includes the log of the governor's age and the log of population to control for the possibility that the governor's wage is adjusted for seniority and to control for the size of the state. This latter effect is analogous to the positive correlation between revenues and CEO compensation that is reported among both for profit and non-profit organizations.

As noted in the introduction, the simple income elasticity is consistent with three alternative interpretations, making it convenient to focus on alternative performance measures. Regression (3) in Table 3A uses the Log of Taxes per Capita in the state as a measure of performance.²⁶ The coefficient is negative and well defined. It shows that if the state's tax payments per capita increase by ten percent, the governor's wage falls by one percent. In contrast to the income sensitivity regressions, only the rewards model predicts this relationship. In comparing the relative impact of tax reductions versus income increases on gubernatorial salaries, while the coefficient on taxation is smaller, it implies a greater sensitivity of the governor's salary to changes in income that take place specifically via tax reductions than general (overall) income increases. More precisely, since taxes are on average 3.5 percent of income, the governor receives the same increase in salary for increasing income by one percent directly, or by increasing income by 0.16 percent (4.5×0.035) via tax reductions. Finally, we also note that while we might be concerned that per capita tax payments would be highly correlated with business cycles (and state per capita income), the coefficient on Log Taxes per Capita is largely unchanged by the inclusion/exclusion of income per capita (see regression (5)). Hence, it appears that taxes exercise an effect on wages that is independent of income.²⁷

We observe that Figure 1 shows a clear break in trend in gubernatorial wage-setting – prior to 1966, there is a steady upward trend, while post-1966, there is considerably more variability. This suggests the possibility that compensation in the

²⁶ We also experimented with decomposing taxation per capita into expenditures and debt financing, by looking at government revenues and expenditures per capita. We obtained similar results from both revenues and expenditures, and found that neither was significant when both variables were included simultaneously.

²⁷ As a further robustness test on the sensitivity of governors' salaries to taxation, we also ran similar regressions using the highest marginal tax rate taken from TAXSIM (see Feenberg and Countts, 1993; the data may be downloaded from <http://www.nber.org/~taxsim>). This measure should not be sensitive to considerations of income distribution. Since these data are only available since 1977 at the state level, regressions with this variables are limited to 1978-1990. Interestingly, we find that the maximum tax rate is also predictive of governors' salaries (t-statistic of -1.58), even for this much reduced sample.

early part of the sample may have been relatively more ‘mechanical.’ This pattern is consistent with the timing of state legislative professionalization that took hold in the mid-1960s (Squire, 1992). In regressions (6) and (7) we therefore split the sample into 1966-1990 and 1950-1964 respectively. Consistent with both the timing of legislative professionalization and the pattern in Figure 1, we find that the results are driven exclusively by the later part of the sample.^{28,29}

As a benchmark, Table 3B estimates similar regressions for average bureaucratic wages in the state. Regression (8) shows that the basic income elasticity of pay is about 0.28, or a little more than half the gubernatorial pay elasticity.³⁰ Regression (9) shows that this holds after including the log of state population to control for size effects. More interesting are regressions (10) and (11) which show that the coefficient on state taxes has a *positive* and significant effect on average bureaucratic wages. Hence, in contrast to the results reported in the gubernatorial regressions, an increase in state taxes is associated with *higher* average bureaucratic wages. This suggests that pay to top political officials is governed by a different set of dynamics than average bureaucratic wages.

IV.b. Further Evidence using the Pay of Other Politicians and Observable Shocks

Table 4A presents the results of regressions where the dependent variable is the log of the wage received by the Health Commissioner in the state. Regression (12) shows that there is also a large income elasticity of pay for these officials. Since the Health Commissioner is possibly one of the members of the executive branch that is least likely to receive incentive pay based on state income per capita, this result is in itself suggestive that at least some component of wage-setting is independent of performance. It could still be argued that politicians are part of teams and that the Health Commissioner is rewarded on

²⁸ As stressed by Wooldridge (2000), autocorrelation of errors can have different implications for the suitability of fixed-effects in levels approaches, as described above, versus first differencing. He suggests that, unless one has strong priors regarding the choice of model, both be utilized to insure robustness. We report the log specification with fixed effects in order to be consistent with previous work on CEO compensation. When we repeat our analyses using first differences, we obtain very similar results. These are available from the authors upon request.

²⁹ Note that Squire (1992) also provides cross-sectional measures of legislative professionalism for 1986-1988. Consistent with our results below, we do indeed find that governors’ salaries in more ‘professionalized’ states have greater sensitivity to taxation and less sensitivity to per capita income. Results available from the authors.

³⁰ However, note that the standard deviation in bureaucrats’ wages is about 30 percent lower than that of governors.

state income, as is the rest of the team. Regression (13) shows that the Health Commissioner's wage is insensitive to the proportion of the state's population that is over 65 years of age, a variable that should be correlated with his workload. Regressions (14) and (15) show that the Health Commissioner's wage is uncorrelated with per capita taxes, making the "team" interpretation suggested above less plausible.

Table 4B studies the effect of observable changes in state income on gubernatorial pay. Reward models suggest that agents' pay should not be affected by changes in performance that are due to observable factors (that are outside the agent's influence), as this simply introduces noise. Regression (16) shows the simplest two-stage least squares specification using the log of average per capita personal income of the state's geographical neighbors (i.e., all adjacent states) as an instrument for the element of income that is unaffected by gubernatorial actions.³¹ The coefficient on *Log of income per capita* is positive, significant and marginally larger than the OLS estimate. This is further suggestive evidence on non-incentive based pay. The identifying assumption is that a state's per capita personal income is affected by regional shocks that are cheap to observe by following the evolution of neighbors' incomes. The first stage regression is

$$\begin{array}{lcl} \text{Log of Inc per Capita} & = & 0.89 \quad \text{Log Neighbors' Inc per Capita} \\ & & (0.03) \end{array} \qquad \begin{array}{l} \text{Adj R}^2=0.97 \\ \text{No Obs}=960 \end{array}$$

where *Log Neighbors' Inc per Capita* denotes the log of average personal income per capita in the state's geographical neighbors, and the regression includes both year and state fixed effects.

Regression (17) explores a potential weakness in our identifying assumption. It is possible that neighbor's income might affect a governor's pay by other channels, namely by providing some benchmark for relative performance evaluation. This argument suggests that neighbor's performance belongs directly in the gubernatorial pay equation. If this were the case, then after controlling for the state's performance, good performance

³¹ Note that we are not suggesting that, in our original wage regression, *Perform* is correlated with ϵ . Rather, we are instrumenting for state income to look at only the component of income that is independent of governors' behaviors.

of neighbors should have a negative impact on gubernatorial pay. The point estimate, however, is positive, though not statistically significant.

We repeat the same exercise to further explore the structure of the tax elasticity of pay. Again the hypothesis is that there exist observable factors that are not influenced by any of the governor's actions that affect the state's level of taxation. An example could be an unexpected weather disruption in the region, such as a storm or a natural disaster. The first stage regression, listed below, shows that there appear to be region-specific shocks to taxation, as a state's level of taxation is highly correlated with that of its neighbors (this relationship is unaffected by the inclusion of neighbors' income):

$$\begin{array}{lcl} \text{Log of Taxes per Capita} & = & 0.25 \text{ Log Neighbors' Taxes per Capita} \\ & & (0.06) \end{array} \qquad \begin{array}{l} \text{Adj R}^2=0.93 \\ \text{No Obs}=960 \end{array}$$

where *Log Neighbors' Taxes per Capita* denotes the log of the average taxes per capita in the state's geographical neighbors, and the regression includes both year and state fixed effects.

In contrast to the results on per capita income, once instrumented, we do not find any effect of taxation on the governor's income, as illustrated by the results in regression (18). A plausible interpretation is that governors may in fact be rewarded for fiscal conservatism rather than 'lucky' tax reductions, although given that the standard error is almost three times the OLS coefficient, strictly speaking we cannot reject either the inference that no performance filtering occurs or that performance filtering is perfect. As in the instrumented income regression above, it may be argued that neighbors' taxes are a useful benchmark for voters in judging the performance of their elected officials, and should therefore be included directly in the performance equation. We examine this possibility in regression (19), and do not find any evidence that this is the case.

Taken together, these results beg the question of why only one performance metric should be governed by reward for performance considerations. One explanation for choosing taxation rather than income as a performance measure is that taxes are more readily affected by the governor, and are also more easily tied to a governor's actions.

Since taxation is a parameter that is much more within the governor's control than overall economic activity, this seems plausible.

IV.c. The Role of Democratic Institutions

Examining the role of democratic institutions provides an opportunity to further probe the validity of our results on rewards for tax cuts, and will allow us to further distinguish between the position and rent-seeking models that are both consistent with the positive correlation between state income and gubernatorial wages. Following the results summarized in the theory section, a *decrease* in the income elasticity of gubernatorial pay would be consistent with our rent-seeking model, while an *increase* in this elasticity would be supportive of the position model.³² We may now investigate these possibilities by looking at the effect of three factors that might improve democratic accountability.

Elections

In an attempt to further examine the role of financial rewards in governors' pay, we make the observation that an important tenet of reward for performance is that agents are rewarded for performance that is correlated with the actions they take, not the actions taken by their predecessors. So, if the income sensitivity of pay reflects reward for performance we expect the point estimate of *Log of income per capita* to be bigger for governors who have been in power for more than one year.³³ Thus we create a variable that takes the value 1 if the governor has been in power for at least 2 years (*In Power* \geq 2). The same is true for the tax elasticity of pay. If governors were punished for delivering tax increases, we would expect to see bigger effects for governors with longer tenure, as they are presumably responsible for those increases. In this context, identifying rent-extraction motives versus rewards is feasible. While a positive interaction effect (*Performance* * *In Power* \geq 2) is consistent with both extraction and reward for performance when performance is measured using income per capita, a negative

³² We note that truly democratic institutions could mean that there are other, more sophisticated ways of controlling politicians so that voters do not need to use wages for this task.

³³ A key motivation for examining this issue comes from the observation that, shortly after Pete Wilson took over as governor of California, he received an 18 percent increase in wage as a result of legislative action that took place before he took office. Obviously, this wage increase could not be related to his performance as governor.

coefficient when taxes are used is evidence of reward-based pay. This is so because a governor could use his experience in office to entrench himself. With taxes as a measure of performance, a negative interaction shows that voters punish (reward) governors more who are more likely to have been responsible for such increases (reductions). An entrenched governor would be able to avoid pay cuts in such circumstances. Regressions (20), (21) in Table 5A show that tenure has little effect on the income elasticity of pay, but that it has a significant negative effect on the tax elasticity of pay. The coefficient on taxes increases by almost 100 percent for governors that have been in power for at least two years. Again, this is consistent with voters using reward for performance when performance is defined as tax payments.

Another approach, which follows Besley and Case, looks at the role of term limits and elections in constraining rent-seeking. Such a role for elections is suggested by the patterns illustrated in Figure 2; we examine this issue more carefully in regressions (22) and (23) of Table 5A. The level effect of facing a term limit is actually negative, though it is not significant. One possible interpretation is that lame duck governors are unable to push through salary increases due to reduced negotiating power. Further, we do not observe any significant coefficients on the interaction of *Lame Duck* with our measures of performance: that is, we do not observe re-election possibilities intensifying the effect of taxation as a reward for performance, or attenuating the rent-extracting effects from economic growth.

Separation of Powers

We also look at the effect of political opposition on the sensitivity of reward-based pay.³⁴ Our reasoning here is precisely analogous to the idea of the co-opting of a board of directors by a CEO: If the board is filled with allies, there will be fewer constraints on the CEO's ability to set his own wage. Persson, Roland and Tabellini (1997) develop this idea in the context of indirect democracy and show that conflict of interest between politicians in different branches of government may attenuate the rent extraction activities of politicians. The regressions in Table 5B evaluate the hypothesis that

³⁴ For a more general discussion of gubernatorial performance when there is divided partisan control of government, see Van Assendelft (1997).

governors who face significant political opposition will have their pay respond more to performance. Here, we do find significant effects that may be interpreted as increased monitoring. The first of these regressions shows that the income elasticity of gubernatorial pay falls by about 0.14, or approximately 25 percent, when the governor's party does not have a majority in the State Senate (*Opposition*).³⁵ The second regression looks at the effect of the opposition on the sensitivity of pay to taxation. We find that the tax elasticity of the governor's wage is more than doubled when the governor's party does not control the Senate.³⁶ Thus, we find the results on tax-setting to be consistent with a reward-based model, where controlled and monitored governors must perform well (i.e., lower taxes) in order to increase their own wages. In contrast, the relationship between state income and gubernatorial compensation is attenuated by the existence of a solid opposition. This is consistent with a rent-seeking view of the state income-wage relationship. Overall, it appears that political/democratic institutions may indeed serve an important role in imposing discipline on gubernatorial wage-setting.³⁷

Direct Democracy

Finally, in Table 5C, we look at the effect of voter initiatives on the performance elasticity of pay. Our hypothesis is that in voter initiative states, where policy is more directly shaped by voters, we should observe a greater weight on the public component of our model, i.e., ϕ is lower in voter initiative states.³⁸ In terms of taxation, the interaction of voter initiative and log of taxes per capita implies that the tax elasticity of pay is significantly (at the 1 percent level) larger in states that allow for voter initiatives. The size of the coefficient implies that the tax elasticity is nearly three times greater in voter

³⁵ We report results using the definition of *Opposition* based on the presence of opposition in the Senate, as it is the final arbiter on matters of gubernatorial pay. It also might be appropriate to account for the role of the Lower House in setting wages, but we then are faced with complications of aggregating the extent of opposition in the two Houses. If we use a standard definition of gubernatorial opposition from the political science literature (Beyle, 1999), the evidence suggests an even stronger role of political opposition in promoting accountability. For a comprehensive analysis of the relationship between governors and legislatures across fifty states, see Rosenthal (1988).

³⁶ We observe even stronger effects when we set a lower threshold for *Opposition* of 40 percent.

³⁷ We also considered a related regression examining whether the tax or income effects were stronger for either political party, by looking at interactions of the governor's political affiliation with the tax and income variables. None of these terms had significant coefficients.

³⁸ This hypothesis has a precedent in the work of Matsusaka (1992), who finds that direct legislation through voter initiatives is particularly common when representatives were unresponsive to the electorate.

initiative states, relative to those that do not allow voter initiatives, again consistent with a reward-based model of tax-setting. The results in (27) are consistent with reduced rent-extraction relative to rewards in voter initiative states: the interaction term on voter initiatives and log per capita income is -0.14 and significant at the 5 percent level, implying that the elasticity of pay with respect to income is about 30 percent lower in voter initiative states relative to states without voter initiatives. This is again in contrast to the position model, which predicts an increased sensitivity of pay to state income, if democracy increases.

V. Conclusion

An important tenet of modern political economy is that politicians are self-interested. Rather than maximize social welfare, it is claimed, they seek power, ego-rents and even bribes, particularly when democratic controls are weak. Once this is recognized, a natural question arises concerning the possibility that pay may be used to motivate politicians through standard (monetary) incentive contracts. Thus, the purpose of this paper is to study politician pay through the lens of the recent literature on executive compensation. We focus on the pay received by state governors in the United States, between 1950 and 1990.

Since, to our knowledge, there is no previous published work on the topic, our first task in the paper is to document the basic patterns in the data. This provides us with a useful starting point. We find that governors' wage data exhibits a substantial amount of variation, both across time and across states. It seems that the view that politicians are paid like bureaucrats can be rejected, at least if by the latter, we mean that politician pay does not exhibit much variation.

We then investigate whether these variations can be matched with state performance indicators. We find that gubernatorial wages respond to changes in the level of income per capita in the state and also to levels of tax payments per capita, even after controlling for state and time fixed effects. Our estimates suggest that governors receive a 4.5 percent increase in pay for each ten percent increase in income per capita in their states and a 1 percent pay cut for each ten percent increase in per capita tax payments.

The income elasticity of pay appears large, both in comparison to the basic elasticity of pay of bureaucratic wages in the state (about twice as large) and compared to the basic estimates in the CEO pay literature. On the other hand, the effects are small if the metric used is the amount of income going to the governors as a proportion of each extra dollar generated for the state.

We then investigate the forces shaping these elasticities. The income elasticity of gubernatorial pay could be explained by three alternative stories. The first is simply that voters attempt to keep governors at a constant position in the income distribution of the state. The second is a variant of a principal agent model where the public rewards the governor for good performance. The third is that the governor is extracting rents when the state has more resources available. The tax elasticity of pay, on the other hand, is inconsistent with the first and third views, and can only be explained by assuming that pay is set to reward the governor when voters are seen as fiscal conservatives.

As a preliminary step in investigating the alternative hypotheses concerning the income elasticity, we propose a simple illustrative test exploiting the fact that including observable noise into a contract reduces the payoff to the principal (as it introduces risk for which the agent must be compensated) and does not improve the governor's incentives. Since the income elasticity is still large and significant after instrumenting for income with observable shocks, it appears that this elasticity is not driven by reward for performance (it could be rent extraction or a desire to keep the governor on a constant position). In contrast, the tax elasticity is insignificant when it is instrumented with similarly observable shocks, consistent with the view that it is governed by a reward-based pay model.

Finally, we report evidence implying that "democracy" plays an important role in shaping gubernatorial pay. The particular form this evidence takes suggests that the income elasticity is driven by rent extraction motives, and rejects the notion that a desire to keep the governor in a constant position in the distribution of income plays an important role. The evidence on the role of democratic institutions is again confirmatory of the hypothesis that the tax elasticity is driven by a rewards model. We find that having the state Senate dominated by the opposition party doubles the tax elasticity of gubernatorial pay and reduces the income elasticity of pay by about one third, a result

that is consistent with the model of separation of powers and political accountability proposed by Persson, Roland and Tabellini (1997). Furthermore, states with ‘direct’ democracy, in the form of voter initiatives, have higher tax elasticities and lower income elasticities of gubernatorial pay than states that do not allow such initiatives.

To summarize,

1. Gubernatorial pay is correlated with economic performance. The elasticities are large.
2. There is strong evidence that the tax elasticity reflects reward for performance motives. There is suggestive evidence that the income elasticity of pay is governed by rent extraction motives.
3. Democratic institutions play a quantitatively large role shaping gubernatorial pay.

Collectively, the evidence presented does not fully establish that pay is an important feature of a politician's reward structure (relative to, say, reelection concerns). It does, however, show that there is enough variation and interesting economic dynamics to suggest that examining the nature of politicians’ pay maybe an empirically fruitful approach to understanding the behavior of politicians.

Figure 1: Median Wages of Government Officers and Bureaucrats, 1950-1990
(in 1982 dollars)

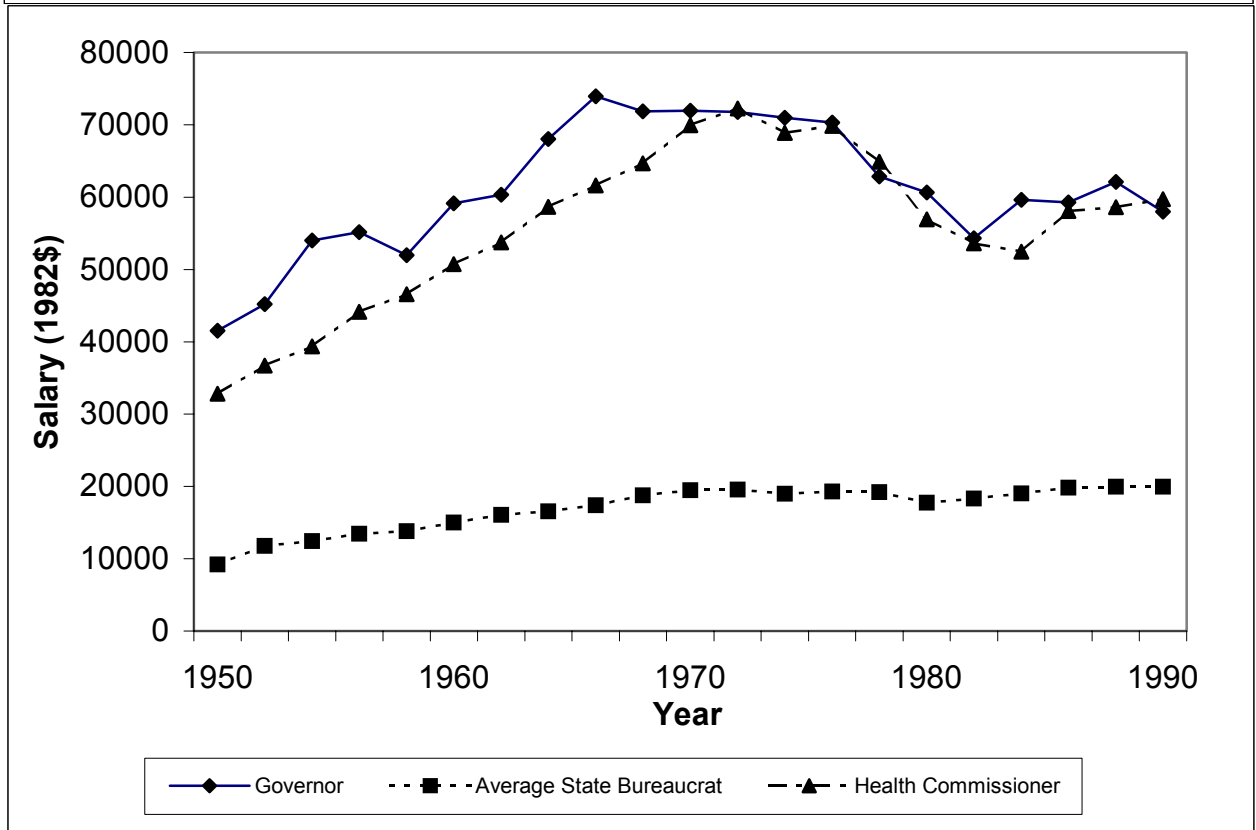
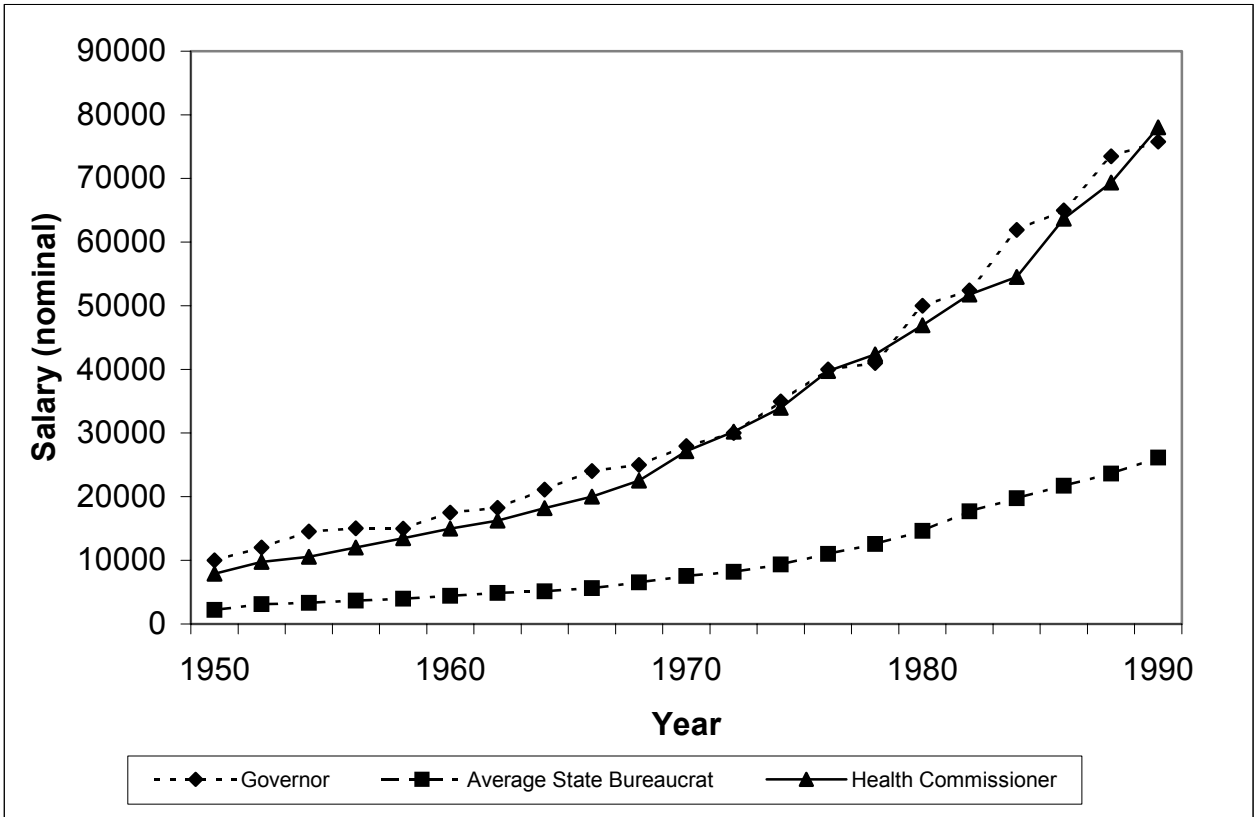


Figure 2A: Average Biannual Salary Increases, all Governors

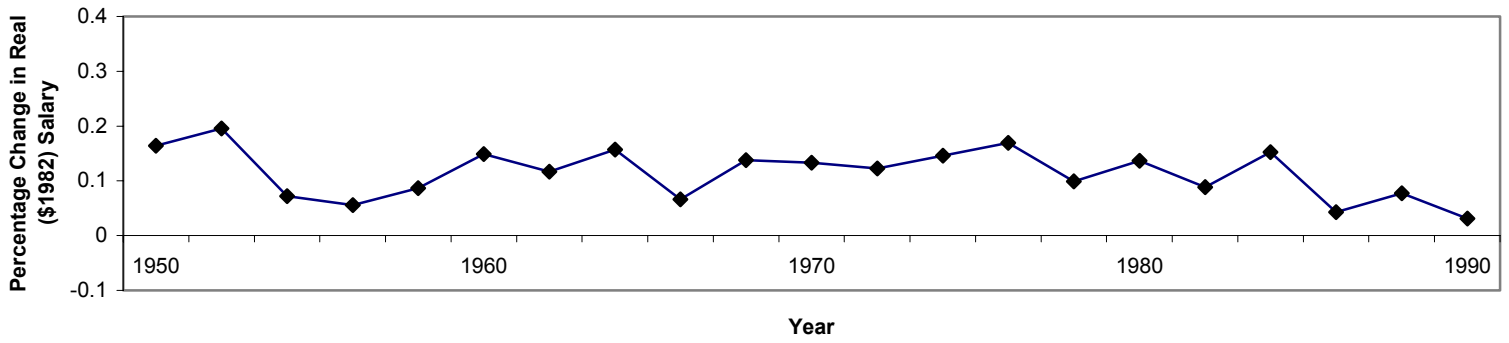


Figure 2B: Average Biannual Salary Increases, Governors not Facing Election

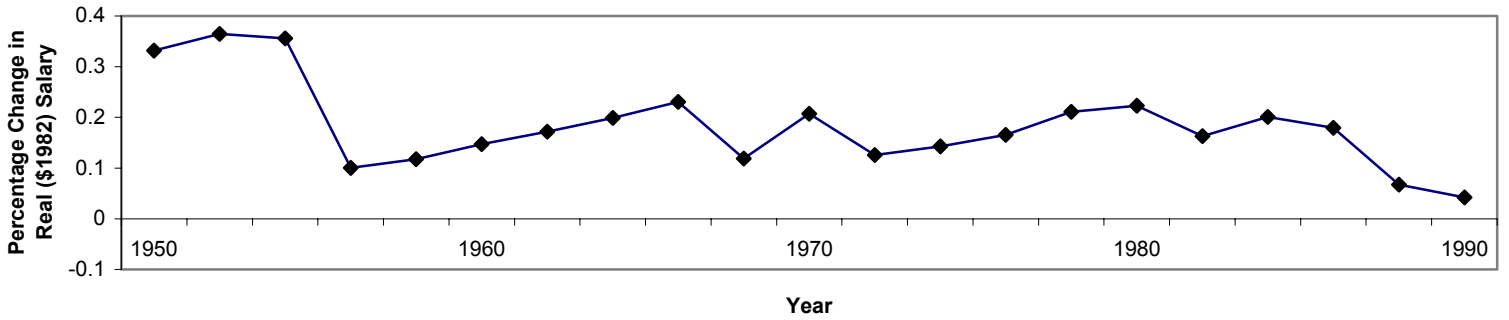


Figure 2C: Average Biannual Salary Increases, Governors with Election within 2 years

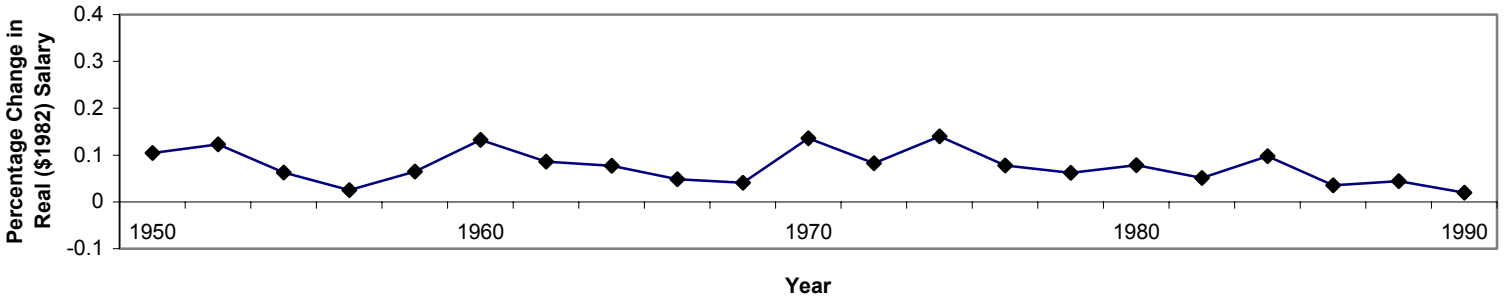


Figure 2D: Difference in percentage change in governor salaries: Those not facing elections minus those facing elections

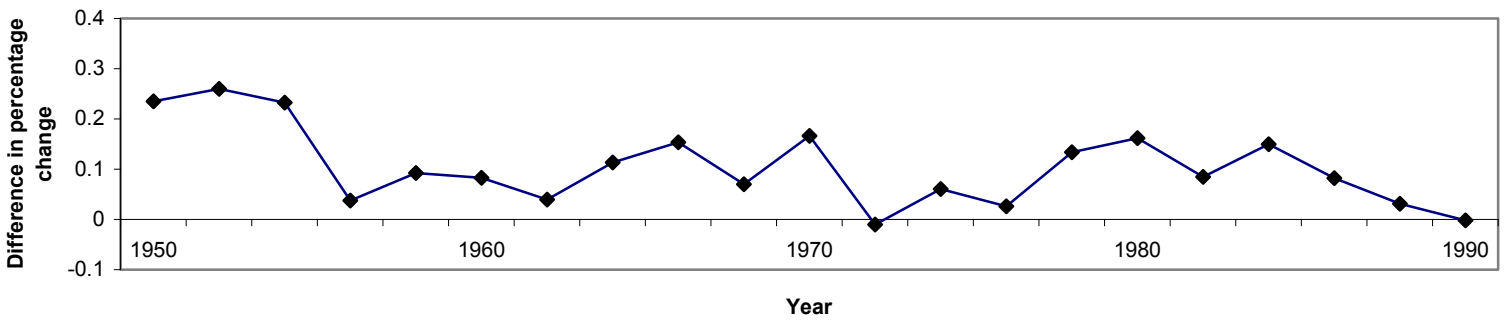


Table 1 – Predicted Elasticities of Governor's Wage

		Low Democracy	High Democracy	
		Rent-Seeking	Position	Reward
Higher Income	Expected	+	+	0
	Unexpected	+	+	+
Higher Taxes	Expected	+	0	0
	Unexpected	+	0	-

Table 2A: Governors' Wages in 1950 and 1990 (1982 dollars)

State	1950	1990	State	1950	1990
Alabama	24,928	53,744	Nebraska	41,547	44,390
Arizona	41,547	57,400	Nevada	31,576	54,229
Arkansas	41,547	26,787	New Hampshire	24,928	57,977
California	103,867	65,054	New Jersey	83,094	65,054
Colorado	41,547	53,574	New Mexico	41,547	68,880
Connecticut	49,856	59,696	New York	103,867	99,494
Delaware	31,160	61,227	North Carolina	62,320	94,136
Florida	49,856	77,209	North Dakota	24,928	49,897
Georgia	49,856	68,017	Ohio	54,011	49,747
Idaho	31,160	42,093	Oklahoma	27,005	53,574
Illinois	49,856	71,380	Oregon	41,547	59,314
Indiana	33,237	59,079	Pennsylvania	103,867	65,054
Iowa	49,856	55,487	Rhode Island	62,320	52,808
Kansas	33,237	55,974	South Carolina	31,160	64,975
Kentucky	41,547	53,368	South Dakota	35,315	46,547
Louisiana	49,856	50,586	Tennessee	49,856	65,054
Maine	41,547	53,574	Texas	49,856	71,507
Maryland	16,619	65,054	Utah	31,160	53,567
Massachusetts	83,094	57,400	Vermont	35,315	58,012
Michigan	93,480	81,654	Virginia	62,320	65,054
Minnesota	49,856	79,488	Washington	62,320	74,008
Mississippi	41,547	57,859	West Virginia	41,547	55,104
Missouri	41,547	67,764	Wisconsin	51,934	65,933
Montana	31,160	39,578	Wyoming	33,237	53,574
			Average	48,090	60,436
			Standard Deviation	21,108	12,850

Table 2B: Lagged Changes in Income and Taxation Associated with the Ten Largest
Gubernatorial Salary Increases (1950-1990)

year	State	$\Delta\log(\text{Salary}_{it})$	$\Delta\log(\text{Income}_{it-1})$	National Avg. $\Delta\log(\text{Income}_{it-1})$	$\Delta\log(\text{Taxes}_{it-1})$	National Avg $\Delta\log(\text{Taxes}_{it-1})$
1960	Alabama	0.709	0.030	0.028	0.043	0.048
1978	Arkansas	1.116	0.033	0.028	0.033	0.052
1968	Connecticut	0.778	0.052	0.027	0.003	0.053
1968	Georgia	0.694	0.046	0.027	0.073	0.053
1954	Illinois	0.722	0.043	0.018	0.077	0.037
1956	Maryland	1.192	0.039	0.033	0.059	0.021
1980	Maryland	0.642	0.021	0.022	-0.002	-0.006
1956	Missouri	0.904	0.037	0.033	0.002	0.021
1956	New York	0.681	0.039	0.033	0.028	0.021
1956	Texas	0.722	0.026	0.033	-0.025	0.021
	Mean	0.816	0.037	0.028	0.029	0.032

Notes: $\Delta\log(\text{Salary}_{it})$ is the first difference of the log of the governor's salary in state i and year t . $\Delta\log(\text{Income}_{it-1})$ is the lagged first difference of the log of per capita GDP in state i and year t . $\Delta\log(\text{Tax}_{it-1})$ is the lagged first difference of the log of per capita taxation in state i year t . The national averages reflect the mean of these values for all 48 states in our sample in year t .

Table 3A: Gubernatorial Pay Regressions, 48 US States, 1950-90

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log Inc per Capita	0.458 (0.117)	0.507 (0.113)			0.527 (0.114)	0.636 (0.193)	-0.054 (0.234)
Log Age		0.031 (0.042)		0.033 (0.049)	0.036 (0.042)	-0.023 (0.051)	-0.085 (0.064)
Log Population		0.199 (0.047)		0.147 (0.049)	0.173 (0.050)	0.208 (0.073)	0.44 (0.12)
Log Taxes per Capita			-0.106 (0.037)	-0.083 (0.038)	-0.099 (0.039)	-0.178 (0.062)	0.043 (0.070)
Year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N of Observations	960	960	960	960	960	624	336
Adj. R ²	0.93	0.93	0.93	0.93	0.93	0.90	0.86

Note: Dependent Variable: Log of Governor's Wage. Column (6) limits the sample to 1966-1990 and Column (7) limits the sample to 1950-1964. Robust standard errors in parentheses.

Table 3B: Bureaucratic Wage Regressions, 48 US States, 1950-90

	(8)	(9)	(10)	(11)
Log Inc per Capita	0.272 (0.026)	0.282 (0.025)		0.274 (0.025)
Log Population		0.044 (0.011)	0.041 (0.012)	0.054 (0.011)
Log Taxes per Capita			0.047 (0.009)	0.038 (0.008)
Year Fixed effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
No of Observations	960	960	960	960
Adj. R ²	0.99	0.99	0.99	0.99

Note: Dependent Variable: Log of Average Bureaucrat's Wage. Robust standard errors in parentheses.

Table 4A: Health Commissioner's Pay Regressions, 48 US States, 1950-90

	(12)	(13)	(14)	(15)
Log Inc per Capita	0.527 (0.115)			0.564 (0.117)
Proportion Age >65		-0.240 (0.823)		-1.027 (0.872)
Log Taxes per Capita			-0.000 (0.039)	-0.022 (0.041)
Log Population				-0.001 (0.061)
Year Fixed effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
No of Observations	960	960	960	960
Adj. R ²	0.95	0.95	0.93	0.94

Note: Dependent Variable: Log of Health Commissioner's Wage. Robust standard errors in parentheses.

Table 4B: Noise Elasticity of Gubernatorial Pay, 48 US States, 1950-90

	(16) 2SLS	(17) OLS	(18) 2SLS	(19) OLS
Instrument	Neighbors' Income		Neighbors' Taxes	
Log Inc per Capita	0.573 (0.149)	0.349 (0.172)		
Neighbors Inc. per Capita		0.200 (0.199)		
Log Taxes per Capita			-0.033 (0.285)	-0.109 (0.365)
Neighbors Taxes per Capita				0.018 (0.088)
Year Fixed effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
No of Observations	960	960	960	960
Adj. R ²	0.93	0.93	0.92	0.93

Note: Dependent Variable: Log of Governor's Wage. Robust standard errors in parentheses.

Table 5A: Accountability and the Electoral Cycle, 48 US States, 1950-90

	(20)	(21)	(22)	(23)
Log Inc per Capita	0.532 (0.117)		0.528 (0.146)	
Log of Taxes per Capita		-0.049 (0.043)		-0.083 (0.041)
Log of Population	0.201 (0.047)	0.153 (0.049)	0.208 (0.055)	0.154 (0.057)
In Power ≥ 2	-0.027 (0.013)	-0.026 (0.013)		
Lame Duck			-0.029 (0.020)	-0.030 (0.020)
In Power ≥ 2 * Log Inc per Capita	-0.044 (0.042)			
In Power ≥ 2 * Log Taxes per Capita		-0.046 (0.024)		
Lame Duck * Log Inc per Capita			-0.026 (0.051)	
Lame Duck * Log Taxes per Capita				-0.003 (0.027)
Year Fixed effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
No of Observations	960	960	960	960
Adj. R ²	0.93	0.93	0.93	0.93

Note: Dependent Variable: Log of Governor's Wage. Robust standard errors in parentheses. Both income and tax data are demeaned, to allow for the interpretation of coefficients on *Lame Duck* and *Opposition* as the effect on an observation with an average level of income or taxes.

Table 5B: The Role of the Opposition, 48 US States, 1950-90

	(24)	(25)
Log Inc per Capita	0.442 (0.121)	
Log of Taxes per Capita		-0.082 (0.041)
Log of Population	0.213 (0.046)	0.153 (0.048)
Opposition	0.006 (0.015)	0.504 (0.171)
Opposition * Log Inc per Capita	-0.141 (0.052)	
Opposition * Log Taxes per Capita		-0.084 (0.041)
Year Fixed effects	Yes	Yes
State Fixed Effects	Yes	Yes
No of Observations	929	929
Adj. R ²	0.93	0.93

Note: Dependent Variable: Log of Governor's Wage. Robust standard errors in parentheses. Both income and tax data are demeaned, to allow for the interpretation of coefficients on *Lame Duck* and *Opposition* as the effect on an observation with an average level of income or taxes.

Table 5C: The Role of Voter Initiatives, 48 US States, 1950-90

	(26)	(27)
Log Inc per Capita	0.469 (0.109)	
Log of Taxes per Capita		-0.058 (0.041)
Log of Population	0.228 (0.049)	0.188 (0.052)
Voter Initiative	-0.053 (0.040)	-0.093 (0.039)
Voter Initiative * Log Inc per Capita	-0.143 (0.052)	
Voter Initiative * Log Taxes per Capita		-0.094 (0.027)
Year Fixed effects	Yes	Yes
State Fixed Effects	Yes	Yes
No of Observations	929	929
Adj. R ²	0.93	0.93

Note: Dependent Variable: Log of Governor's Wage. Robust standard errors in parentheses. Both income and tax data are demeaned, to allow for the interpretation of coefficients on *Voter Initiative* as the effect on an observation with an average level of income or taxes.

Appendix A: Definition of Variables

Log of Governor's Wage: The logarithm of the governor's wage (benefits not included), in 1982 dollars. Source: *Book of the States*

Log Inc per Capita: The logarithm of state income per capita, in 1982 dollars. Source: *Statistical Abstract of the United States*

Log Taxes per Capita: Log of total state taxes per capita. This includes income, sales, and corporate taxes. Derived from *Statistical Abstract of the United States*

Log Age: The logarithm of the governor's age in the current year. Source: *Book of the States*

Log Population: The logarithm of total state population. Source: *Statistical Abstract of the United States*

Log of Health Commissioner's Wage: The logarithm of the Health Commissioner's wage (benefits not included), in 1982 dollars. Source: *Book of the States*

Proportion Age > 65: Percentage of the population that is greater than 65 years of age. Source: *Statistical Abstract of the U.S.*

Log of Bureaucratic Wages: The logarithm of the average annual wage of state and local bureaucrats, in 1982 dollars. Source: *Statistical Abstract of the U.S.*

Log of Neighbors Inc per Capita: Log of the average level of State income per capita of the states that are geographically adjacent.

Log of Neighbors Taxes per Capita: Log of the average level of Taxes per Capita of the states that are geographically adjacent.

In Power ≥ 2 : Dummy variable taking on a value of 1 if the governor was in power in the previous observed time period, i.e., two years prior.

Opposition: Dummy variable taking on a value of 1 if the governor's party has below a certain threshold in the state Senate (cutoffs of 30, 40, and 50 percent).

Lame Duck: Dummy variable taking on a value of 1 if the governor is prohibited by law from running for reelection.

Voter Initiative: Dummy variable taking on a value of 1 if policy may be set through direct voter initiative.

Appendix B: *Summary Statistics*

	Mean	Std. Dev.	Min.	Max	Obs.
Governor's Wage	65,346	23,713	16,619	203,275	960
Log of Governor's Wage	11.03	0.35	9.72	12.22	960
Age of Governor	51.53	7.72	34	73	960
State Income Per Capita	8,785	2,642	2,917	18,808	960
Log(State Income Per Capita)	9.03	0.32	7.98	9.84	960
State Population (1000's)	4,131	4,281	163	28,100	960
Log(State Population)	14.76	1.01	12.00	17.15	960
State Taxes Per Capita	435.58	215.72	70.44	1157.23	960
Log(State Taxes Per Capita)	5.94	0.55	4.25	7.05	960
Health Commissioner's Wage	55,904	15,614	18,835	108,751	960
Log(Health Commissioner's Wage)	10.89	0.30	9.84	11.60	960
Average Bureaucrats' Wage	17,202	4,067	7,129	28,279	960
Log(Avg Bureaucrats' Wage)	9.72	0.25	8.87	10.25	960
Log of Neighbors' Income per Capita	10.74	0.49	8.95	11.76	960
Log of Neighbors' Taxes per Capita	7.28	0.68	4.61	8.50	960
Opposition	0.36	0.47	0	1	929
In Power ≥ 2	0.64	0.48	0	1	960
Lame Duck	0.31	0.46	0	1	960
Voter Initiative	0.48	0.50	0	1	960

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