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Empirical Determinants of Chief Political Officer Pay

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First Draft, October 23, 2000. Comments Welcome

This Draft: December 12, 2000

Abstract

Contrary to widespread assumptions, there is substantial variation, both across states and across time, in the salaries of politicians. In this paper, we examine the empirical determinants of Chief Political Officer (CPO) pay guided by the literature on executive compensation. Using data for 1950-94 for the US, and controlling for fixed effects, we find that gubernatorial wages respond to increases in state income per capita and taxes. The economic effects are large. Governors receive a 4.4 percent increase in pay for each ten percent increase in income per capita in their states and a 5% pay cut for each percentage point increase in income tax rates. We then test 'pay for performance' versus rent-extraction models of pay determination. The evidence suggests that the income elasticity is driven by rent extraction considerations, while the tax elasticity is governed by a (very primitive) pay for performance model. Lastly, we find document several patterns that suggest that that "democracy" plays a role in shaping CPO pay.

Keywords: Bureaucratic pay, politician pay, rent-extraction, incentives.
JEL: J3, H7.

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I. Introduction

An important question in economics and politics concerns the motivation of politicians. A traditional starting point is that politicians, in contrast to private sector managers, are socially motivated. That is, 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 it allows politicians to subsist at a reasonable level, pay should not affect their actions. This perspective, however, does not sit well with our intuitions as researchers, or as human beings. In response, over the last 50 years or so, economists and political scientists have considered more realistic formal models of political economy. In these models, politicians seek to maximize their chances of re-election rather than social welfare, try to expand the size of the organizations they manage, and even accept bribes. However, once politicians have some pecuniary motivation, it would seem that a natural starting point in trying to understand their conduct is the study of politician pay. The primary purpose of this paper is to take a first step in analyzing the officially sanctioned financial compensation of politicians.

Economists often assume that non-private sector workers face flat pay schedules and low powered incentive schemes. A case in point is bureaucratic compensation.[1] 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)). Although we know of no fully-fledged model of politician pay, a reasonable first approach to these issues suggests that, similar to the 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.[2] Yet, in any particular year, there are large differences in Chief Political Officer (CPO) pay. 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. Furthermore, there are also large differences in CPO pay, in real terms, over time.

[1] The title of a recent paper on executive compensation is "Are CEO's really paid like Bureaucrats?" (Hall and Liebman, 199x). This paper simply takes as obvious that bureaucrats have low-powered incentives.
[2] The arguments presented in Tirole (1994), for example, justify this s;tatement.

Average pay for governors (in 1982 dollars) went from $48,090 in 1950 up 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 of over time and across states. So, one important contribution of this paper is simply documenting some of these basic patterns. Furthermore, we go on to analyze the relationship between the governor's wage and state performance, using data for 48 states over the period 1950-92. Our empirical strategy follows the approach developed in the executive compensation literature and applies it to politician pay (see Murphy (1985)). Our key findings suggest that, controlling for state and year fixed effects, there is a statistically significant association between CPO pay and state per capita income. The elasticity is unexpectedly large, in excess of 0.4.

Two alternative theories can explain the relationship between wages and income. In a principal agent model, the public implicitly provides incentives for politicians so that they put forward effort in the design and implementation of good policies. Since good policies are assumed to increase income, the public rewards the governor when they experience higher income with higher wages. This can be called "pay for performance". An alternative theory maintains that politicians are rent-seekers. They take as much in salary as they can, constrained by the public's patience and the cultural stigma attached to greedy public servants. This can be called "rent-extraction". The two theories can be distinguished by examining 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. The most obvious example is aggregate income. If governors receive higher salaries as a result of increases in income that originate in the aggregate economy, then we can reject pay for performance in CPO pay. Our approach is in many ways similar to that taken recently in the executive compensation literature by Bertrand and Mullainathan (2000) (see also Aggarwal and Samwick (1998)). The evidence is one sided: most of the income sensitivity of CPO pay seems to fall in the category of rent-

extraction.[3]

Inspired by theories describing voters as fiscal conservatives, we include the state's tax rate as a second measure of performance (see Peltzman (1992)). We find a strong and robust negative effect of taxes on CPO pay. We find that governors suffer a 5% pay cut for each percentage point increase in income tax rates, or equivalently, a one standard deviation increase in the personal income tax rate brings about a decline of 20% of a standard deviation in CPO pay. In other words, governors get a similar pay increase if they raise income per capita of their voters by 10% or if they reduce income tax rates by one percentage point. It is harder to frame the results on tax rates in terms of rent extraction, as it is difficult to come up with shocks to a state that would allow for an exogenous reduction in tax rates, that did not operate through changes in income.[4] Furthermore, the strong correlation between tax rates and gubernatorial salaries derives primarily from salary increases of governors that have been in office for more than a year, suggesting that voters (and legislatures) may, in fact, be rewarding governors for fiscal discipline (or, symmetrically, punishing governors for fiscal irresponsibility). This is at least suggestive that, in addition to rent extraction, at least some form of pay for performance *could* be governing gubernatorial wages.

In a firm, managers' salaries are set, at least in theory, by the shareholders of the firm. Analogously, voters may be seen as ultimately setting the salaries of politicians, and may have some scope to do so through various political institutions. Unfortunately, economists have paid too little heed to such issues: As Wittman (1989) warned, economists give too small a role to democratic institutions in the formulation of policy. In his view, economists routinely construct models where a perfectly competitive market for goods exists beside a very imperfect market for votes. He goes on to assert that this asymmetry exaggerates the information and coordination problems (amongst others)

[3] In analogous work, concurrent with our own, Wolfers (2000) finds that in elections, governors are also rewarded for luck. Using the methodology of Bertrand and Mullainathan (2000), he finds that exogenous shocks to state income increase the likelihood of re-election.

[4] One possibility is that demographic shifts, such as an increased proportion of elderly or young in the population of the state, could require shifts in tax rates, because of changes in expenditures on health care, and so forth. This is problematic, since health-care expenditures are largely covered by transfers from the federal government. Furthermore, empirically, we do not find that such demographic shifts lead to significant changes in tax rates, after state income has been properly controlled for.

present in voting markets that, when properly functioning, tend to yield "policy-efficient" outcomes. Accordingly, we investigate if "democracy" plays a role in controlling the rent-extraction activities of politicians. Since our sample consists of the US over the last 40 years, heterogeneity of democratic practices is a relative term. First, similar to Besley and Case (1995), we exploit variations in gubernatorial term limits and reelection opportunities to provide some evidence on the role of accountability. Second, we look at the way in which having the state senate controlled by the opposition affects the determination of CPO pay in the state. Our results provide some evidence that "democracy" plays a role in the determination of Chief Political Officer pay.

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.

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 principal agent models, where there is incentive-based pay, or rent-extraction models. Lastly, we check if democracy limits the amount of rent-extraction.

II.A. Basic Estimates of the Performance-Elasticity of Pay

The basic regression takes the form

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

Where $Wage_{it}$ is the governor's wage in year t and state i, $Perform_{it}$ is a measure of performance such as the *Log of GDP per Capita* or the *Tax Rate*, $Controls_{it}$ is a set of controls that include the governor's age or 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. The hypothesis that politicians are paid like bureaucrats (i.e., compensation is not tied to performance) is equivalent to testing for $\alpha>0$. This coefficient can then be compared with those obtained in similar

regressions in the literature on executive compensation, as well as comparable regressions that use bureaucratic wages as the dependent variable.

II.B. Testing Pay-for-Performance versus Rent-Extraction Models

Second, we investigate if this is evidence of pay for performance or of rent extraction by politicians. A first, simple test is provided by examining regressions of the determinants of Chief Health Officer (i.e., State health commissioner) pay. The strategy is to examine the pay of the member of the executive branch whose effort is least likely to affect performance. Accordingly, a principal agent model predicts that his/her pay should not be based on state income per capita.

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 canonical principal agent model predicts that the presence of noise reduces the power of incentive schemes (see, for example, Holmstrom (1979)). Recent empirical work in executive compensation has focused on this feature of the principal agent model (see, for example, Aggarwal and Samwick (1999) and Bertrand and Mullainathan (2000); see Wolfers (2000) 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. It consists of re-estimating regression (1) with two-stage-least-squares techniques using the log of average GDP for the state's neighbors (*AVG GDP*). Since *AVG GDP* is observable, and presumably reflects a regional shock that cannot be attributed to the governor's performance, it should not affect pay, under a pay-for-performance 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.[5] In other words, the hypothesis is that, once instrumented, the state's income is should not affect politician pay.

[5] It is also possible to include AVG GDP directly into regression (1). But as stressed in Bertrand and Mullainathan (2000), this approach is uninformative. In general, finding a coefficient on AVG GDP that is not equal to the negative of the coefficient on the state's GDP will not be enough to reject pay for performance. It could well be that GDP and AVG GDP have a very low level of correlation.

We also report results using a second source of exogenous variation, utilized by Wolfers (2000): the interaction of the price of oil with industry shares in each state.[6] The price of oil is likely beyond the control of state governors,[7] and it is hard to imagine how the oil price would affect gubernatorial salaries in any way other than through its effect on aggregate state income. To get variation across states, we take advantage of the fact that some sectors of the economy will be more adversely affected by shifts in the price of oil than others. For example, manufacturing industries will suffer more relative to service industries. Hence, states that are dependent primarily on manufacturing will suffer more relative to service-oriented states as a result of oil price increases. Thus, the interaction of state sector intensity and oil prices should serve as an appropriate source of exogenous variation in state income.

In the final section of the paper we test whether democracy broadly conceived, helps limit the rent-extraction activities of politicians. The tests we explore are of two basic types. First, we study the role of term limits. As in Besley and Case (1995), we check for different behavioral responses of our basic model when the governor can seek re-election versus situations when they are legally impeded from doing so. This approach unfortunately has significant shortcomings, since we expect two counteracting effects. Governors without the discipline of future elections might be expected to try to extract greater rents. On the other hand, the shortened expected time in office resulting from an imminent departure from office will reduce incentives to fight for increased pay.

Perhaps more compelling, we check if the income sensitivity of CPO pay is lower when the opposition party controls the state senate. The idea is that the public takes 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 takes gubernatorial pay decisions, we focus on the role of this section of the legislative. 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.

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[6] We thank Justin Wolfers for kindly providing us with these data.
[7] Wolfers (2000) addresses this concern directly, and finds no evidence that this assumption is problematic.

III. Data Sources and Descriptive Statistics

Our basic outcome variable, the level of pay of state governors, is taken from *Book of the States*, a publication of the *Council of State Governments.* Since this is only a biannual publication, our regressions are limited to observations from even years. This publication has comprehensive coverage of the salaries of all constitutional officers and senior bureaucrats from each state, and was also the source of our salary data for the Chief Health Officer (usually 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).[8] We also collected data on the average salary of a bureaucrat in each state, taken from the *Statistical Abstract of the U.S.*[9]

Our primary 'performance' measure is state income per capita (again, in 1982 dollars), taken also from the *Statistical Abstract of the U.S.* In later specifications, we also include tax rates as a measure of performance, focusing on income taxes. Our measure of tax rates is simply the average income tax rate, given by total income taxes per capita divided by income per capita.

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.[10] A parallel argument also applies in the case of governors: the casual cross-sectional correlation between state population and governor's salary is, not surprisingly, very high (=0.63 for 1992). Since population also tends to be correlated with income and wealth, it will be important to include state population as a control. Since life-cycle considerations might also be important for the governor in seeking pay increases, we will 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 pay for performance, we also define a variable that takes on a value of one in

[8] Since most of our regressions will have a log linear specification with year fixed effects, this deflation will be irrelevant.
[9] Unless specified, all data below are taken from the *Statistical Abstract the U.S.*
[10] 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.

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 variable that takes on a value of zero if the governor is of the same political party as the majority in the state Senate, and one otherwise (data on the political affiliations of state senators come from the *Book of the States*).[11] A related hypothesis below looks at the disciplining effect of re-election; for this, we define the variables Lame Duck as a binary variable that takes on a value of one if the governor is in his last term of office, as dictated by gubernatorial term limits (*Book of the States*); and Upcoming Election, which takes on a value of one if there is an election before the next observation at t=y+2.

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[12]). In order to utilize the tax data of Case and Besley, our series ends in 1988. Since, as mentioned above, we only have biannual observations for our salary data, we are limited to looking at even years. Hence, our data set consists of 20 years and 48 states for a total of 960 observations. 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 pay in government.

Table 1 shows gubernatorial salaries, by state, for 1950 and 1988, in 1982 dollars. The median salary over this period has increased by only about 33 percent, from 48,090 to 64,157, while real average bureaucratic wages increased by 114 percent over the same time period.[13] It is also striking to note that, while the average increased during 1950-88,

[11] While we consider 50 percent to be a natural cutoff in the definition of this variable, it is important to note that our results are in no way sensitive to this choice. In fact, if we choose a lower threshold of 45 percent, our results are considerably stronger. Choosing a higher cutoff (55 percent) attenuates our results slightly.

[12] This has the additional benefit of excluding the two states that do not have any neighbors, and would therefore have to be excluded from our 2SLS regressions.

[13] Other top state officials experienced pay increases that, while somewhat lower than the average bureaucratic rate of increase, was nonetheless approximately double that of the governor. For example, average treasurer salaries increased by 64 percent, and average Health Commissioner salaries increased by 68 percent.

the variance across states actually declined by about half, indicating a very strong convergence of salaries during the period.

Figure 2A shows the median level of annual salaries of our three types of government officials for each year during 1950-1988, in 1982 dollars. Perhaps not surprisingly, there is considerable co-movement in the salaries of the governor and the Commissioner of Health.[14] This is consistent with the idea that compensation is for the entire 'team'. 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.[15] It is also worth noting that there is much greater smoothness in the salaries of average bureaucrats 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.

It is also interesting to note that there are periods over which governors' salaries decline in real terms. There are, however, almost no nominal declines in salaries (only 6 of any magnitude in our data, one of which is accounted for by the Massachusetts governor donating a third of his salary to charity); hence, almost all salary declines come from periods where salaries remained constant or increased at a rate lower than inflation. This is illustrated in Figure 2B, which shows the median level of government officials' salaries in nominal terms. Since, in many states, increasing the governor's salary requires legislative approval, it is not surprising that there are many years in our data where nominal wages remained unchanged (511 out of 912 observations). Thus, gubernatorial salaries increase, on average, less than once every four years. That the frequency of salary increases happens to coincide with the frequency of gubernatorial elections seems unlikely to be pure coincidence: this belief is further reinforced through Figures 2A-D. In Figure 2A, which shows the average percent change in governors' salaries over the preceding two years, it is apparent that salaries 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. That peaks in the figure coincide with years in which there had

[14] More generally, we find that the salaries of constitutional officers and senior bureaucrats in each state move together.

[15] Furthermore, *changes* in salaries are not so highly correlated: the correlation between changes in gubernatorial salaries and the salaries of Health Commissioners is only about 0.15.

been recent gubernatorial elections. 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 2B,2C). Moreover, when we look at the difference between these two groups, we find that salary increases are uniformly much higher for governors not facing imminent elections. While these results are highly suggestive of certain political economy explanations, we will defer further interpretations to the result section below, where we may further examine these patterns while appropriately controlling for other factors.

Finally, to aid the interpretation of our regression results below, we list the summary statistics for our data in Appendix B.

IV. Empirical Results

III.A. Basic Estimates of the Performance-Elasticity of Pay

In this section we estimate the basic relationship between CPO pay and two measures of performance. The first is simply the (log of) income per capita of the state. Regression (1) in Table 2A, shows the simplest specification. The coefficient on income per capita is positive and comfortably significant. A one-percent increase in income per capita is associated with a 0.39 percent increase in the governor's wage. This is a large elasticity: to a first approximation it is as large as the estimates obtained CEO compensation literature (see, for example Murphy (1999)). 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.[16] This effect is precisely analogous to the positive correlation between revenues and CEO compensation that is reported among both for profit and non-profit organizations.

Regression (3) in Table 2A uses the average income tax rate in the state, defined as income tax paid per capita divided by per capita personal income, as a measure of performance. The coefficient is negative and well defined. It shows that the state's average tax rate increases by one percentage point, the governor's wage falls by 5 percent.

[16] Using the size of government (revenues or employment) yields qualitatively identical results)

As a benchmark, Table 2B estimates similar regressions for average bureaucratic wages in the state. Regression (6) shows that the basic income elasticity of pay is about 0.16, less than half the CPO pay elasticity.[17] Regression (7) shows that this holds after controlling for the log of state population to control for size effects. Most interesting perhaps, is regressions (8) and (9) which show that the coefficient on state taxes is positive and significant. Hence, in contrast to the results reported in the CPO regressions, an increase in state taxes leads to *higher* average bureaucratic wages (We return to this issue in the next section, where we examine the salaries of chief health officers). This suggests that pay to top political officials is not governed by similar dynamics as average bureaucratic wages.

III.B. Testing Pay-for-Performance versus Rent-Extraction Models

Table 3A presents the results of regressions where the dependent variable is the (log of) the wage received by the chief health officer (i.e., Health Commissioner) in the state. Regression (10) shows there is also a large income elasticity of pay for the health officers. Since the health officer is possibly one of the least likely members of the executive branch to receive incentive pay based on state income, this result is in itself is suggestive of extraction motives. It could still be argued that politicians are part of teams and that the health officer is rewarded on state income, as is the rest of the team. Regression (11) shows that the health officer pay is insensitive to the proportion of the state's population that is over 65 years of age, a variable that is expected to be correlated with the workload of the health officer.[18]

Table 3B studies the effect of predictable changes in state income on CPO pay. Pay for performance models suggest that agents should not be rewarded for changes in performance that are due to observable factors that are outside the agent's influence.[19] Regression (14) shows the simplest two-stage least squares specification using the log of average GDP per capita of the state's geographical neighbors as an instrument. The coefficient on *Log of GDP per Capita* is positive, significant and 51% larger than the

[17] This overstates the difference in a sense, since the standard deviation for bureaucrats' salaries is about 30 percent lower than that of governors.
[18] Ideally we would use here a variable measuring health outcomes such as mortality.

OLS estimate. Regression (15) shows a slightly larger coefficient once the log of the governor's age and the log of the state's total population are included as controls. The identifying assumption is that state's per capita GDP is affected by regional shocks that can be observed by just following the evolution of the neighbor's GDP. The first stage regression is

Log of GDP per Capita	=	0.800	Neighbors GDP per Capita
		(0.032)	

Adj R^2=0.97

No Obs=1056

where Log GDP per Capita (-j) denotes the average GDP per capita in the geographical neighbors, and includes both year and fixed effects.

Regression (16) explores a potential criticism to our identifying assumption. It is possible that neighbor's income might affect governor's pay by other channels, namely by providing some benchmark for relative performance evaluation. In other words, this argument suggests that neighbor's performance belong directly in the CPO pay equation. The hypothesis then is that controlling after for the state's performance, good performance of the neighbors should have a negative impact on CPO pay. The point estimate is positive, however, with a significance level of 11%.

Regressions (17-19) report results using the interaction of industry sector shares and oil prices as the source of exogenous variation.[20] In the first stage regression, these interactions are highly significant (F(8,978) = 22.60), and take on sensible signs (e.g., the interaction of manufacturing with oil price is extremely large and negative). The coefficient on the instrumented state income variable is very high, taking on a value of approximately 1.5, nearly four times the coefficient reported in the OLS regressions. When the industry shares are included together with state income in an OLS regression (19), the coefficient on state income falls by about 25%.

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[19] We are also in the process of collecting more clearly exogenous instruments, such as the interaction of oil dependence and oil prices, and import/export intensity and exchange rates.

[20] See Wolfers (2000), for a complete description of these data, and a discussion of their use.

Returning now to evidence that governors are rewarded for doing well, an important tenet of pay for performance is that agent's are rewarded for performance that is correlated with the actions they take, not the actions taken by their predecessors. In other words, if the income sensitivity of pay reflects pay for performance we expect the point estimate of *Log of GDP per Capita* to be bigger for governors who have been in power for more than one year. Thus we create a variable that takes the value 1 if the governor has been in power more than 2 years (*In Power >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, presumably, they are responsible for those increases. Again identifying rent-extraction motives versus pay for performance is feasible. While a positive interaction effect (*Performance * In Power >2*) is consistent with both extraction and pay for performance when performance is measured using GDP per Capita, a negative coefficient when taxes are used is evidence of pay for performance. This is so because a governor could use his experience in office to entrench him/herself. With taxes as a measure of performance, a negative interaction shows that voters punish (and reward) more governors 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 3C show that tenure has little effect on the income elasticity of pay, but that it has negative significant effects on the tax elasticity of pay. The negative coefficient on taxes is almost doubled when we are dealing with governors that have been in power longer than two years. Again this is consistent with voters using pay for performance when performance is tax rates.

III.C. The Role of Democracy

To the extent that the democratic process controls rent-seeking by governors, we might expect term limits and imminent elections to play an important role in salary-setting. This is strongly suggested by the patterns illustrated in Figure 2. However, interpretation of these results is contaminated by a number of factors. Most importantly, a number of states (12) explicitly disallow any gubernatorial salary increases prior to the next election. While the remaining states do not have such laws laid out explicitly, it is possible similar norms informally govern wage-setting in these states as well. Furthermore, governors

approaching elections will also be approaching the ends of their terms, so there may be less incentive to push up their own salaries.[21] Thus, while we report regressions that show that governors are less likely to raise salaries in the period immediately preceding an election (see regression 22), the interpretation of this result is problematic.

More promising, perhaps, is looking at the effect of political opposition on the sensitivity of pay to performance. 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. Regressions (22-23) evaluate the hypothesis that governors who face significant political opposition will have their pay respond more to performance. Regression (22) shows that the income elasticity of gubernatorial pay falls by about one third when the governor's party does not have a majority in the senate (*Opposition*). Regression (23) evaluates the equivalent hypothesis for taxes. It shows that when the senate is controlled by the opposition, the tax elasticity of the governor's wage is about 50 percent higher than the tax elasticity when the Senate is controlled by the same party as the governor. Thus, once again, we find the results on tax-setting to be consistent with the idea that controlled and monitored governors must perform well (i.e., lower taxes) in order to increase their own salaries. Hence, political/democratic institutions may indeed serve an important role in imposing discipline on gubernatorial wage-setting.

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. Once this is recognized, we are faced with an important question: what are the instruments we have to control a politician? The traditional approach assumes the key instrument is voting. But if politicians are at least partially motivated by money, a natural starting point is to examine the incentive effects of salary setting (particularly in an environment such as the US, where governors cannot take bribes at will). Although many

[21] Some governors may have pensions that depend on their final salaries, which would obviously provide for a different set of incentives. We are currently collecting data to look into this issue.

theories predict that governmental wages should be low powered, some categories such as gubernatorial wages exhibit large variations, both across states and over time. In this paper we try to explain what determines pay for the top political officers in the US states.

We first examine the basic performance elasticity of gubernatorial pay. We find that governors obtain a 44% increase each time state per capita income is doubled. There are also some size effects: more populous states tend to pay their governors better. The income elasticity of pay is large, both in comparison to the basic elasticity of pay of bureaucratic wages in the state (about 3 times) and compared to the basic estimates in the CEO pay literature (see Murphy (1999) for a review). Another important influence on gubernatorial pay is the tax rate. In accordance to the view of voters as fiscal conservatives presented in Peltzman (1992), governors receive a 5% pay cut for each percentage point increase in taxes.

We then test pay for performance versus rent-extraction models of pay determination. We find that pay to the Chief Health Officer in the state, an employee with arguably a tenuous influence on state income, also has a high income elasticity. Furthermore, we still find high income elasticity of pay after instrumenting state income with the average income of the state's geographical neighbors and with oil prices interacted with state industry shares. Including such observable measures of luck only increases the noise in performance measures (for which agents must be compensated) and does not improve incentives to provide effort. In other words, it is hard to square the evidence with an optimal pay for performance model. However, we do find some support for the notion of performance-related pay in tax-setting.

Finally, we study if democratic forces affect politician pay determination. We find that governors who face a large opposition in the state senate (which is where pay is determined) have very different performance elasticity of pay. The effect of significant opposition in the senate is to cut income elasticity by a third and to increase the tax elasticity of pay by more than 50 percent.

Figure 1: Median Salaries of Government Officers and Bureaucrats, 1950-1988

(in 1982 dollars)

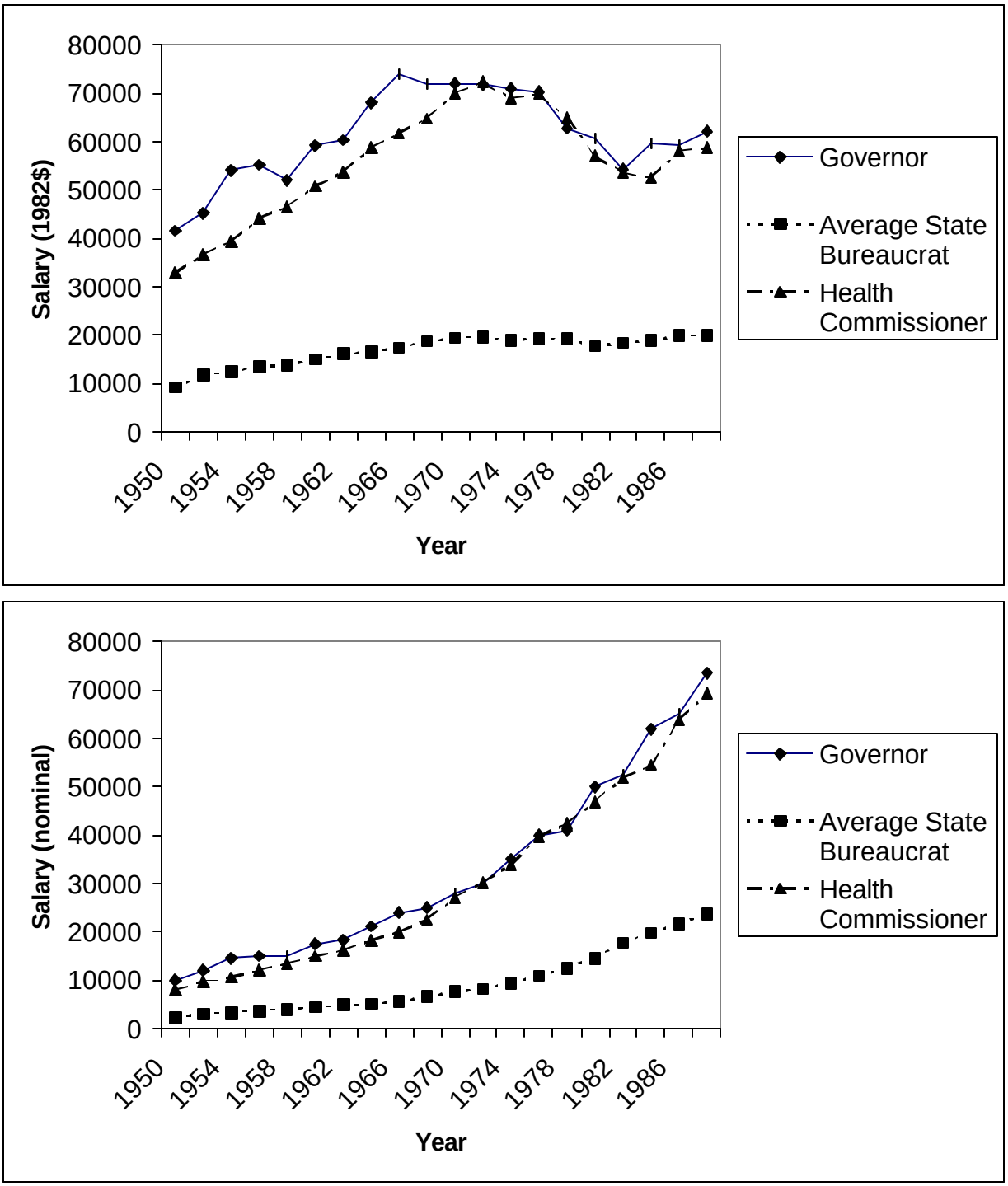

Figure 1A: Average Biannual Salary Increases, all Governors

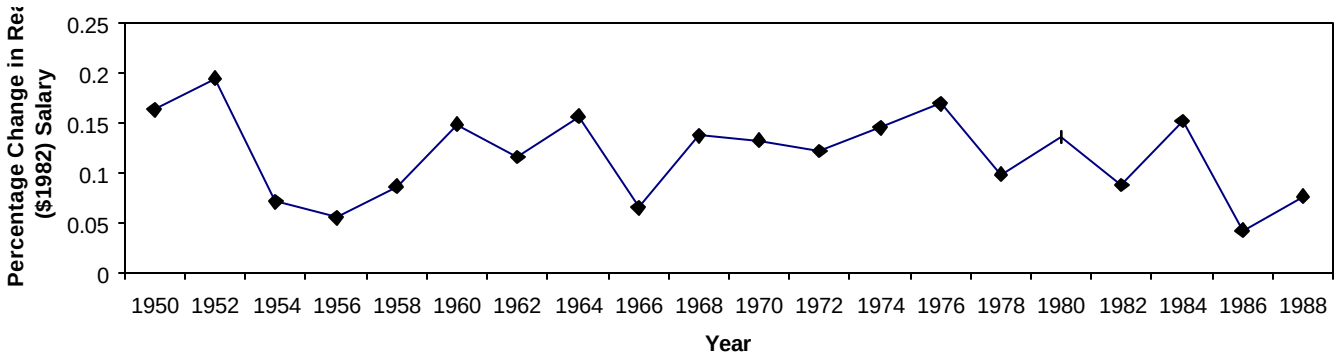

Figure 1B: Average Biannual Salary Increases, Governors not Facing Election

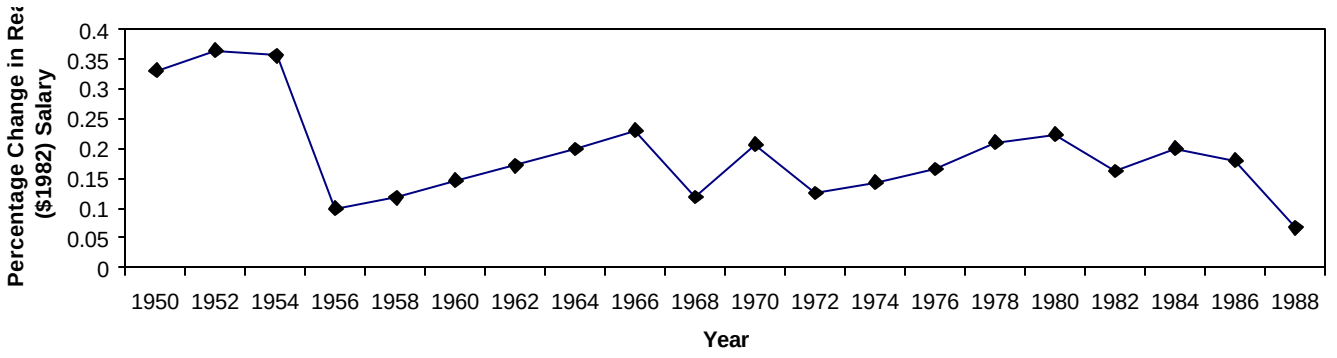

Figure 1C: Average Biannual Salary Increases, Governors with Election within 2 years

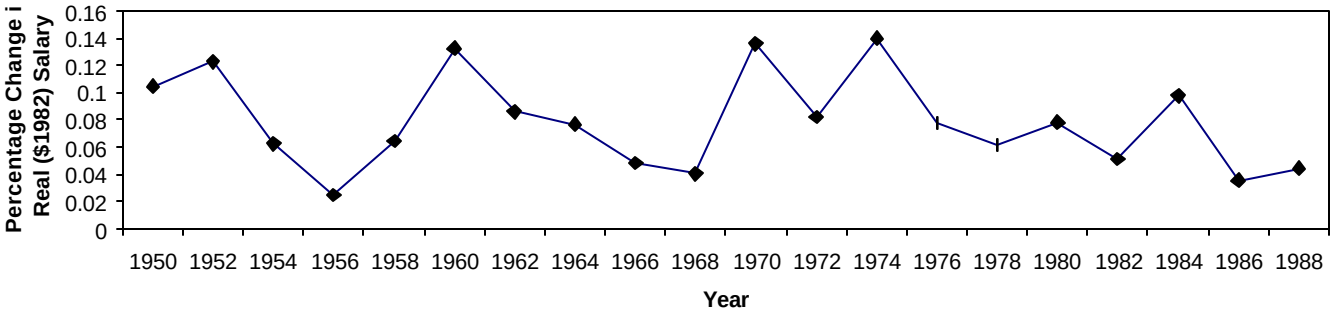

Figure 2D: Difference in percentage change in governor salaries: Those not facing elections minus those facing elections

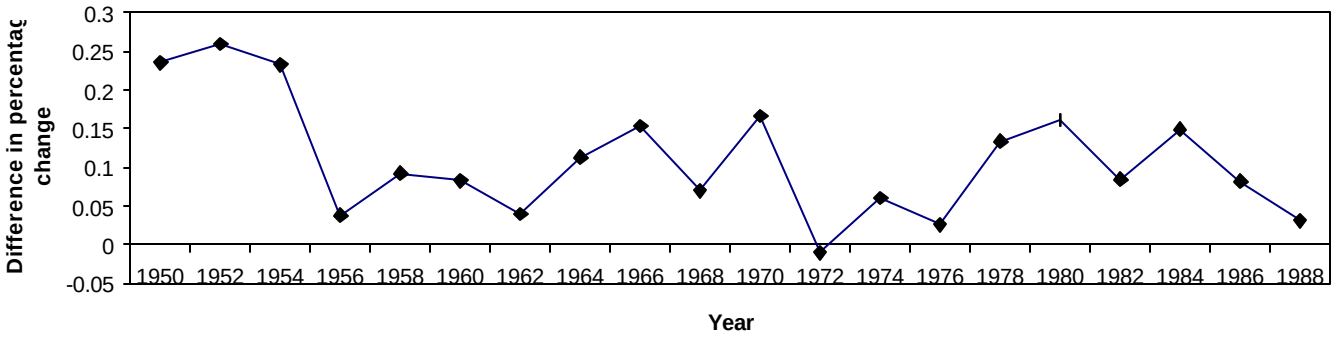

Table 1: Governors' Salaries in 1950 and 1988 (1982 dollars)

State	1950	1988	State	1950	1988
Alabama	24928	59379	Nebraska	41547	49044
Arizona	41547	63419	Nevada	31576	65533
Arkansas	41547	29595	New Hampshire	24928	57504
California	103867	71875	New Jersey	83094	71875
Colorado	41547	59191	New Mexico	41547	53272
Connecticut	49856	65956	New York	103867	109926
Delaware	31160	59191	North Carolina	62320	88786
Florida	49856	81722	North Dakota	24928	51459
Georgia	49856	71531	Ohio	54011	54963
Idaho	31160	46507	Oklahoma	27005	59191
Illinois	49856	78864	Oregon	41547	62150
Indiana	33237	65279	Pennsylvania	103867	71875
Iowa	49856	59191	Rhode Island	62320	59106
Kansas	33237	55549	South Carolina	31160	69000
Kentucky	41547	57807	South Dakota	35315	48472
Louisiana	49856	62066	Tennessee	49856	71875
Maine	41547	59191	Texas	49856	77455
Maryland	16619	71875	Utah	31160	50735
Massachusetts	83094	71875	Vermont	35315	53779
Michigan	93480	84623	Virginia	62320	71875
Minnesota	49856	79657	Washington	62320	70860
Mississippi	41547	53272	West Virginia	41547	60882
Missouri	41547	68492	Wisconsin	51934	72001
Montana	31160	42661	Wyoming	33237	59191

Table 2A: CPO Pay Regressions, 48 US States, 1960-92

	(1)	(2)	(3)	(4)	(5)
Log GDP per Capita	0.390 (0.102)	0.442 (0.098)			0.380 (0.106)
Log Age		0.027 (0.041)		0.0157 (0.044)	0.022 (0.044)
Log Population		0.210 (0.041)		0.122 (0.054)	0.164 (0.054)
Tax Rate			-7.019 (1.577)	-6.053 (1.753)	-4.656 (1.726)
Year Fixed effects	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
No of Observations	1056	1056	960	960	960
Adj. R^2	0.93	0.94	0.92	0.93	0.93

Note: Robust standard errors in parentheses. Dependent variable=log of governor's wage.

Table 2B: Bureaucratic Wage Regressions, 48 US States, 1960-92

	(6)	(7)	(8)	(9)
Log GDP per Capita	0.159 (0.022)	0.172 (0.022)		0.192 (0.023)
Log Population		0.055 (0.014)	0.049 (0.016)	0.071 (0.015)
Tax Rate			0.830 (0.482)	1.542 (0.491)
Year Fixed effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
No of Observations	959	959	959	959
Adj. R^2	0.99	0.99	0.99	0.99

Note: Robust standard errors in parentheses. Dependent variable=log of bureaucratic wages.

Table 3A: Chief Health Officer Pay Regressions, 48 US States, 1960-92

	(10)	(11)	(12)	(13)
Log GDP per Capita	0.468 (0.094)			0.510 (0.100)
Proportion Age >65		-0.3126 (0.790)		-1.020 (0.882)
Tax Rate			0.442 (1.366)	2.137 (1.448)
Log Population				0.048 (0.060)
Year Fixed effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
No of Observations	1056	1056	960	960
Adj. R^2	0.95	0.95	0.94	0.94

Note: Robust standard errors in parentheses. Dependent variable=log of chief health officer's wage.

Table 3B: Instrumenting State Income

	(14) 2SLS	(15) 2SLS	(16) OLS	(17) 2SLS	(18) 2SLS	(19) OLS
Instrument	Neighbors' GDP			Ind-Oil Interaction		
Log GDP per Capita	0.590 (0.141)	0.629 (0.140)	0.326 (0.130)	1.50 (0.291)	1.51 (0.283)	0.316 (0.102)
Log Age		0.028 (0.042)	0.029 (0.041)		0.034 (0.045)	0.029 (0.041)
Log Population		0.223 (0.041)	0.207 (0.041)		0.283 (0.052)	0.197 (0.043)
Neighbors GDP per Capita			0.240 (0.150)			
Ind. Shares interacted with Oil Price Included?	No	No	No	No	No	Yes
Year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No of Observations	1056	1056	1056	1056	1056	1056
Adj. R^2	0.93	0.94	0.94	0.92	0.93	0.94

Note: Robust standard errors in parentheses. Dependent variable =log of governor's wage.

Table 3C: Performance Effects for New versus Older Governors

	(20)	(21)
Log GDP per Capita	0.393 (0.116)	
Tax Rate		-4.838 (1.683)
In Power >2	0.136 (0.400)	0.006 (0.018)
In Power > 2 * Log GDP per Capita	-0.018 (0.044)	
In Power > 2 * Tax Rate		-3.540 (1.223)
Year Fixed effects	Yes	Yes
State Fixed Effects	Yes	Yes
No of Observations	1056	1056
Adj. R^2	0.93	0.94

Note: Robust standard errors in parentheses. Dependent variable =log of governor's wage.

Table 4: Electoral Discipline, The Role of the Opposition

	(24)	(25)	(26)
Log GDP per Capita	0.313 (0.108)	0.2983 (0.113)	0.280 (0.113)
Tax Rate	-6.24 (1.54)	-6.59 (1.64)	-5.76 (1.72)
Election Next Period	-0.045 (0.013)		
Opposition		0.918 (0.511)	0.011 (0.022)
Opposition * Log GDP per Capita		-0.103 (0.056)	
Opposition * Tax Rate			-2.47 (1.33)
Year Fixed effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
No of Observations	960	928	928
Adj. R^2	0.93	0.93	0.93

Note: Robust standard errors in parentheses. Dependent variable=log of governor's wage.

Appendix A: *Definition of Variables*

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

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

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

Neighbors GDP per Capita: The average level of State Income per Capita of the states that are geographically adjacent.

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

Tax Rate: Total state income taxes paid divided by total state income. Derived from *Statistical Abstract of the United States*

Log of Chief Health Officer Wage: The logarithm of the Health Commissioner's salary (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 salary of state and local bureaucrats, in 1982 dollars. Source: *Statistical Abstract of the U.S.*

Opposition: Dummy variable taking on a value of 1 if the governor's party has less than a majority in the state Senate.

Upcoming Election: Dummy variable taking on a value of 1 if there is an election within 2 years.

Lame Duck: Dummy variable taking on a value of 1 if the governor cannot be elected for another term.

Appendix B: Summary Statistics

	Mean	Std. Dev.	Min.	Max	Obs.
Governor's Salary	65345.79	23712.88	16618.73	203274.50	960
Log(Governor's Salary)	11.03	0.35	9.72	12.22	960
Age of Governor	51.52917	7.72974	34	73	960
State Income per capita	8784.92	2642.21	2916.51	18808.32	960
Log(State Income per capita)	9.03	0.32	7.98	9.84	960
State Population (1000's)	4131	4281	163	28100	960
Log(State Population)	14.76	1.01	12.00	17.15	960
Average Income Tax Rate	0.011	0.010	0	0.04	960
Health Commissioner's Salary	55904.14	15614.27	18835.12	108751.80	960
Log(Health Commissioner's Salary)	10.89	0.30	9.84	11.60	960
Average State Bureaucrats' Salary	17202.18	4067.15	7129.43	28279.04	959
Log(Avg State Bureaucrats' Salary)	9.72	0.25	8.87	10.25	959
Opposition	0.34	0.47	0	1	926
Lame Duck	0.31	0.46	0	1	926
Upcoming Election	0.62	0.49	0	1	960

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