Do Higher Salaries Lead to Higher Performance? Evidence from State Politicians*

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Abstract

The control of moral hazard in government via incentives is a central theme in political economy. Are politician wages an important component of the incentive structure? This paper studies this question using six decades of data on all state legislators and governors in the United States. Using both a fixed effects analysis and a spatial discontinuity analysis of electoral districts straddling borders, we find that the effect of politician salary on most governmental outcomes is small. Higher salary is associated with statistically significant, but economically small increases in electoral competitiveness, and may slightly increase political productivity and decrease shirking. Salary has no effect on measures of politician quality (e.g., politician schooling levels). We provide evidence that strong political parties may contribute to the small impact of salary; the effects of politician salary are higher in states where political parties are weaker, suggesting that parties may serve as barriers to entry. Increased wages may have adverse side effects; politician time-use data reveals that politicians in higher wage states spend greater time fundraising. Taken together, our results lend caution to claims that increasing politician salary would increase the quality of government in the United States, and support the view that formal wages are not the main driver of incentives for politicians.

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1 Introduction

The control of moral hazard is central in almost all organizations, public and private. In seeming contrast to agency theory, many workers are paid a flat wage or salary. This does not mean these workers do no face incentives. When workers face the risk of losing their job, high salaries may incentivize effort, since higher salaries mean workers have more to lose relative to their outside option. Outside of effort, higher salaried jobs can increase performance because they may draw in higher ability job-seekers. Despite the large theoretical literature on this issue, there is relatively little empirical work on whether higher salary increases worker performance.

One of the most important organizational settings for controlling moral hazard is government. Political leaders can have very large impacts on policy and economic growth (Jones and Olken, 2005) and designing institutions that promote talented talented people to run for office and to govern well is a central issue in political economy (Barro, 1973). A large literature focuses on understanding how incentives regarding re-election (e.g. term limits) affect politician effort (e.g. Besley and Case, 1995). Another potentially important, but much less studied institutional feature is a politician's salary. How does politician salary affect who runs for office and, once elected, whether politicians exert effort? In addition to importance for theory, how salary affects political performance is important for policymakers. In the U.S., this is particularly true in state politics, where there is wide variation in salaries, and there is significant concern of low performance by politicians.

In this paper, we study whether politician salary increases political performance using new data on all U.S. state legislators and governors over the last 60 years. Using the large variation in politician alary across states and over time, and employing difference-in-difference, selection on observables, and spatial discontinuity research designs, we find consistent evidence that politician salaries have statistically significant, but economically very small positive impacts on different measures of political performance.

Concerns about sub-optimal politician salaries arise frequently in discussions about the quality of U.S. state government. U.S. states are responsible for funding or providing many public services including education, prisons, and health care. Given the importance of the functions they administer, a common concern has been that salaries are too low. The Council of State Governments, a national organization representing state government and government officials, in particular, has argued that low legislative compensation has deleterious consequences. According to Keon Chi, editor-in-chief of the Council of State Government's *Book of the States*, "If legislators are not paid adequately, then candidates are drawn from a smaller pool. ...You can't expect to attract good candidates with pay that is lower when compared to other jobs and professions."[1] Our paper helps address this important policy issue.

To fix ideas, we begin by presenting a simple model of how political salary may impact perfor-

[1]Quoted in "Legislators' pay falling behind" by Eric Kelderman, February 13, 2007, article on Stateline.org.

mance. Building on the citizen candidate model of Besley and Coate (1997) and Shubik, citizens choose whether to run for office by weighing the gains from office against their outside option. Higher ability workers have higher outside options, so increasing salary makes higher ability workers want to work in politics instead of as lawyers and businesspeople. In addition, since a politician's chance of getting re-elected depends on them exerting effort to provide public goods, higher salaries mean that politicians become more concerned with getting re-elected, and thus exert more effort. Theory by itself, however, can determine the likely magnitude of these effects, nor assess how these magnitudes compare with alternative countervailing forces.[2]

We test the model using the large variation across states and over time in salary for state legislator and governors. We find that increasing state legislator salary by 50% is associated with a one percentage point increase in the probability an election is contested and increases the number of candidates in the election by 0.025. It increases by share of bills approved by the legislature by 0.7 percentage points and decreases the probability of a missed roll call vote by 1 percentage point. These effects are statistically significantly different from zero and are precisely estimated. The effects on state legislature salary on the share of legislators who have college degrees or who are women or minorities are statistical zeros. These effects are very small compared with the variation in these measures over time or across states. In terms of governors, we find that politician salary appears to have almost no impact on running for office or on performance.

An important concern is that politician salaries are not randomly assigned. For example, states may be likely to increase wages when times are good, leading to unobservables economic differences to correlate with changes in politician salary. Although we control for state GDP, a state that experiences a positive shock in the labor market for lawyers may be more likely to increase wages. To address this, we use a spatial discontinuity design, comparing legislative districts on either side of state borders. While California and Nevada may have very different markets for lawyers, it may be the case that the market is more similar comparing a district in eastern California with a bordering one in western Nevada. By using the spatial discontinuity design, we are able to take advantage of these types of bordering districts so that our regressions compare, for instance, elections in an eastern California district to elections in a western Nevada district

Another significant concern is that changes in politician salary may be correlated with other institutions in the state. Although we collected a large amount of data on changes in state legislative institutions over time, it is certainly possible that changes in salary may correlate with unobserved changes in institutions. To address this, we consider a selection-on-observables research strategy where we control for various aspects of legislature professionalism.

We consider different mechanisms for our results. Politician salaries in many states are low relative to other corporate and professional jobs, and many politicians are independently wealthy. It

[2]At least one paper, Mattozzi and Merlo (2008), argues that increasing political wages could decrease political quality on average. Mattozzi and Merlo (2008) show this can occur if higher quality politicians receive higher financial payoffs after serving in office; increasing the political wage may reduce their comparative advantage.

could simply be the case that differences in politicain salary we observe are too small to really affect politician incomes or affect their behavior. We show, however, that politician salaries do comprise a substantial portion of earnings for politicians and that salaries have a significant impact on whether politicians work outside of politics. Another possibility is that politicians are intrinsically motivated; the effort they exert is because of a "calling" and not because of a desire to get re-elected. Using a unique dataset on politician time-use, we show that when politicians receive higher salaries, they spend more time on fund-raising and on helping constituents with problems, as opposed to on developing legislation. Rather than increasing performance, differences in politician salary may cause politicians to re-allocate their time from general political tasks to tasks that increase their chance of being re-elected. Just as in the literature on multi-tasking with incentive pay, when higher pay can lead workers to divert attention from one activity to another, so too can higher salary have small impacts on desired performance when there are multiple dimensions of performance, and workers can switch effort from tasks that do not affect keeping the job to those that do. We also provide evidence that strong parties may play a role in the small impacts of salaries, with politicians in strong party states showing much less response to salary than those in weak party states.

Compared to several other recent papers on the impact of politician salary (Ferraz and Finan, 2010; Gagliarducci and Nannicini, 2010; Fisman et al., 2011), the impacts on political performance we estimate are an order of magnitude smaller. Ferraz and Finan (2010) and Gagliarducci and Nannicini (2010) study the impact of politician salary for mayors in Brazil and Italy using similar research designs. In Brazil and Italy, the salary of mayor changes discontinuously with city population, allowing for regression discontinuity estimates of the impact of politician salary on politician selection and performance. Fisman et al. (2011) study politician performance in the European Union, exploiting a recent pay equalization policy that significantly increased salaries for politicians from certain countries. All three papers find very large impacts on performance. While it is of course possible that politicians in the U.S. may simply be "different" than politicians in other countries, or that differences in methods between the papers are important, we believe that it may be useful to consider differences in political institutions. In the Brazilian municipalities studied by Ferraz and Finan (2010), politics is highly decentralized and political parties are very weak. In contrast, the two main political parties in the United States are very strong. Using differences across states. There is also substantial recent theoretical work analyzing the impact of politician salary including Besley (2004), Caselli and Morelli (2004), and Mattozzi and Merlo (2008).

Within the United States, however, we know of very little prior empirical work on the impact of politician salary.[3] We suspect that part of the absence may be due to data limitations. There is no central database on politician salary, and collecting the data required significant hand-collection of data. In economics, the only work we are aware of is by Diermeier et al. (2005) and Keane and

[3]There is at least one stream of literature in Political Science that uses politician salaries to estimate the relationship between legislature professionalization and political outcomes Berkman, 1994; Squire, 1997 but the primary focus of these papers has not been politician salary itself.

Merlo (2010). These two papers estimate structural models of career decisions for U.S. congressmen. Their counterfactual simulations include an investigation of how changes in congressional wages affect congressional career decision-making. By analyzing the impact of politician salary using wage variation across states, our analysis complements their counterfactual results.

In addition to workers increasing effort to avoid getting fired and being more attracted to higher salaries, workers may work harder to salaries they perceive as gifts (Akerlof and Yellen, 1988, 1990). The last 20 years has seen a great deal of work testing gift exchange exchange theory using lab experiments and field experiments (e.g. Falk, 2007; Fehr and Gächter, 2000; Gneezy and List, 2006).

To summarize, our analysis makes several contributions. First, it provides the first comprehensive analysis of the effects of politician salaries in the United States. Second, we analyze a very wide range of outcomes, larger (to our knowledge) than has been studied for other countries. We analyze the effects on outside labor income, electoral competitiveness, partisan electoral advantage, politician quality (as measured through politician schooling and other characteristics), politician productivity (as measured by bill-passing), shirking (as measured by missed roll call votes), and politician time use. Third, we show that strong political parties may play an important role in dampening the impact of politician salary on outcomes.

Section 2 provides background on compensation for state politicians in the United States. Section 3 provides a very preliminary model of how salary affects political behavior. Section 4 describes the data and estimation strategy. Section 5 shows the estimation results. Section 5.4 offers an explanation for our findings. Section 7 concludes.

2 Politician Salary in U.S. State Governments

There is large variation in the salary of state politicians in the United States, both legislators and governors. Table 1 shows the real salary in 1960 and 1990 for legislators and governors. For legislators, pay in some states has been persistently very low. Information over time is shown graphically in Figure 1.

Politician pay is determined differently for governors and for legislators. For governors, pay is determined by a state's upper assembly. The amount is frequently adjusted. Further details on the process of compensation for governors are given in Di Tella and Fisman (2004). While governors and legislators serve in two different branches, they are both important and interesting to study. Governors are more like CEOs whereas legislators are one of many and it is plausible that salaries impact them differently.

Pay for state legislators is set in several different ways. In some states, pay is set by the constitution. For example, the New Mexico state constitution specifies that legislators will receive no pay (except for some expenses). While New Mexico is exceptional in having a pay for legislators of zero over time, other states also have pay that is constitutionally determined. In these states, the

pay remains at a level for some period of time, and is changed only if the constitution is amended. In Texas, for example, the pay for legislators was at $4,800 for a long period of time before the constitution was amended and pay changed to $7,200. In other states, pay for legislatures is determined by a state compensation commission. Salaries are adjusted frequently, usually annually, to account for changes in the cost of living and to be commensurate with the pay of other governmental officials and bureaucrats. In other states, pay for legislators is set by statue, either a law outside of the constitution, or in some cases the legislators can essentially set their own pay. In some cases, legislators vote on their own pay, but the increases only take effect for the next term.[4]

One issue in analyzing the effects of compensation on selection and productivity for state legislators is that the nature of the legislature differs substantially across states. In some states, like California and Michigan, the legislature is in session every year for a large part of the year. In other states, legislatures often meet for 3 to 6 months. In other states, legislatures will only meet every other year. Meeting every other year used to be common. As of 2010, only five legislatures meet every other year: Montana, Nevada, North Dakota, Oregon, and Texas.

The form of legislative compensation also differs across states. In some states, legislators are paid a yearly annual salary. For example, in California legislators made $125,000 per year in 2008. This amount is paid irrespective of the number of days the legislature meets. In other states, legislators are paid a daily wage.[5]

The existence of the variation in legislative session length and in the form legislative means that we need to be careful in our analysis of the effects of legislative compensation. By using state and year fixed effects, we focus on the "within legislature" effects of changes in compensation. Thus, our results will not be driven by New Hampshire having short session lengths, or Montana meeting only every other year. In addition, we convert daily compensation into an annual compensation figure by multiplying the daily rate by the average number of days a legislature meets for over time. we also control for session length as a time-varying right-hand side variable.

3 Model

We develop a simple model to analyze how politician wages affect the number of candidates for an office, the quality of candidates and politicians, politician productivity, and public goods provision. For ease of comparison, we use much notation in common with

We consider a 2 period economy with no discounting in which politicians are citizen-candidates endowed with quality θ, with θ distributed across the population with distribution function $F(\cdot)$. The size of the population is set to unity, and the number of candidates running is given by N.

[4]Per the 27th amendment to the US constitution passed in 1992, this is the method use by the US congress in setting its compensation.

[5]In Vermont, legislators receive a weekly wage.

Politicians receive a wage of w per period in office, whereas working in the private sector leads to a wage of r per period. While in office, politicians choose a costly effort (productivity) level e, with a convex cost function $c(\cdot)$. Effort and quality lead to public goods G_t, with $G_t = G_t(e_t)$, $G' > 0$, and $G'' < 0$. Politicians can serve for two periods so those who are elected in the first period can be re-elected for the second period but cannot run again after the second period. Politicians are re-elected with probability π, where this probability increases in the amount of public goods provided and $\pi^{''} \leq 0$. If an incumbent loses, the new politician is selected randomly from among the challengers. Running for office is assumed to be costless. We consider the case of an office that has been newly created with no incumbent going into the first period. In the first period, one candidate is randomly selected to serve from all those who run.

We deal with two cases.

3.1 Reservation Wage Increases in Quality

This first case parallels that in

Proposition 1 *Suppose that the reservation wage increases with politician quality. Then an increased wage leads to more candidates, higher quality candidates and politicians, higher politician productivity, and more public goods.*

Proof. If a politician has been re-elected for a second period in office, there's no chance of re-election. Therefore, the politician will optimally exert 0 effort.

In the first period, if a politician has been elected, the politician will choose effort to maximize $\pi(G_1(e_1))w + (1 - \pi(G_1(e_1))r(\theta) - c\,(e_1)$, leading to a first order condition of $C = \pi'(G_1)G_1' * (w - r) - c' = 0$. Applying the Implicit Function Theorem leads to

$$\frac{\partial e}{\partial w} = -\frac{-\frac{\partial C}{\partial w}}{\frac{\partial C}{\partial e}} = -\frac{\pi^{'} G'}{\pi'' G'^2 * (w - r) + \pi^{'} G'' * (w - r) - c''} = +$$

which is positive because of the assumption of convex costs and a weakly concave effect of public goods provision on the re-election probability and of effort on public goods. Higher effort leads to greater public goods.

Politicians run for office in the first period if $(1 + \pi)w > 2r\,(\theta)$. The number of candidates is given by $N = \Pr((1 + \pi)w - 2r(\theta) > 0) = F(r^{-1}(\frac{(1+\pi)w}{2})$,which is increasing in w because $\frac{d\pi}{dw}$ is positive and r is increasing in θ. Average candidate quality, $\overline{\theta}$, is equal to $\int_{-\infty}^{r^{-1}\frac{(1+\pi)w}{2}} \theta f(\theta) d\theta$, and $\frac{d\bar{\theta}}{dw} = r^{-1}\frac{(1+\pi)w}{2} f(r^{-1}\frac{(1+\pi)w}{2}) \frac{dr^{-1}\frac{(1+\pi)w}{2}}{dw}$, which is positive. A higher wage leads to higher average politician quality. ■

In the empirical results, we show that there the relationship between wage and the number of candidates is very small. One possibility, that we now illustrate, is that in states with strong

political parties, entry is decided by the party. As a result, potential candidates are less able to respond to salary increases.

3.2 Political Party Strength as Barrier to Entry

We now consider a different case. We assume that citizens who would like to run for office have to convince the party to allow them to run. In order to do so, they must invest some time or money into the party prior to running. This investment, $\tau < 1$, is a party tax on politician salary. The stronger the political party, the more investment potential candidates have to put into the party to convince the party that they should be be allowed to run. This captures the idea that the incentives of parties may differ from the incentives of an individual candidate and stronger parties are more able to control who runs.

Proposition 2 *Suppose the party tax is increasing in state party strength. Then, an increase in party strength leads to fewer candidates.*

Proof. Politicians run for office if $(1-\tau)(1+\pi)w > 2r(\theta)$. The number of candidates is given by $N = \Pr((1-\tau)(1+\pi)w - 2r(\theta) > 0) = \Pr((1-\tau)(1+\pi)w - 2r(\theta) > 0) = F(r^{-1}(\frac{(1-\tau)(1+\pi)w}{2}))$ which is decreasing in τ because r is increasing in θ. ■

4 Data and Empirical Strategy

4.1 Empirical Strategies

Our baseline specification is a fixed effects model:

$$y_{est} = \alpha_0 + \alpha_1 w_{st} + X_{st}\beta + f_s + f_t + \epsilon_{est}$$

where y_{est} is an outcome variable for election e in state s in year t, w_{st} is the salary in state s in year t, X_{st} is a vector of covariates, f_s and f_t are state and year fixed effects, and ϵ_{est} is an error.[6] we estimate equations of this form for both state legislators governors. The outcome variable y will include measures of outside-politics labor supply, electoral competitiveness, candidate quality, legislative productivity, shirking, public goods provision, and time allocation toward politics versus fundraising. We cluster standard errors at the state level following Bertrand et al. (2004).

In these regressions, the identifying assumption is that politician salary is uncorrelated with error term conditional on the spatial fixed effects, the time fixed effects, and other controls. This assumption may be violated given that politicians' salaries are not randomly determined across

[6] Our initial estimates use fixed effects for states instead of for electoral districts. Estimating using electoral districts fixed effects is somewhat challenging due to the fact that electoral districts change over time due to re-distributing. It is not conceptually difficult, however, to use electoral district-year fixed effects as we do later on in our analysis of electoral districts straddling state boundaries.

states over time. The direction of any resulting bias depends on the outcome of interest and the wage-setting process in the state. In states where the wage is determined by the constitution, political pressure will not affect the wage, unless pressure rises to a sufficient level so that constitution is amended. State compensation boards are intended in part to be free from the possibility of political manipulation, but it is unclear to what extent this is the case. The simplest possibility for bias seems to occur when politicians set their own pay; perhaps the other form of pay-setting can be viewed as situations which may approach a situation of politicians' own wage-setting given the right circumstances.

How does one expect the bias to occur? In arguably its simplest form politicians may set wages to conform to voter's beliefs about what the appropriate compensation should be given politicians' quality and their behavior. For example, low quality politicians may be reluctant to give themselves a high wage if there is a widely accepted definition of quality that the public is aware of. Similarly, politicians who expect to shirk and have a very unproductive legislative session may choose not to vote themselves a higher wage for the coming year, as otherwise the popular backlash will be twofold, one over the politicians' lack of productivity and again over a salary increase.

In general, these possibilities seem to suggest that fixed effect regressions may overstate the key of salary on key political economy outcomes. However, it is certainly possible to think of situations where the bias could go in the opposite direction.[7] These biases can be roughly classified as *endogenous wage setting.*

Another class of biases to consider may be roughly referred to as *correlated trends and shocks.* It is clearly possible that other changes, either to aspects of being a state politician or to a state's political equilibrium, may be occurring at the same time as a wage change. One example is that states may change non-wage job amenities at the same time as wage changes, for example, by changing legislative responsibilities or by renovating the capital building or living quarters for legislators. The late 1960s and 1970s saw a large increase in the "professionalization" of state legislatures, where wages were increased, along with other changes such as lengthening legislative sessions and providing increased legislative staff Fiorina (1994). We attempt to disentangle salary changes from changes in other amenities by controlling for legislative session length over time and by controlling for time-varying measurements of a legislator's staff. There are many other examples of time-varying unobserved shocks. In our model, a key component of political competition is a prospective politician's outside wage, for example, the economic opportunities for lawyers in a local area. We can attempt to control for shocks to a politician's outside option by including wage controls, but it seems likely that there are local economic shocks that will not be picked up by these controls. If politician wages are changed at the same time as an unobserved shock to a politician's outside option, the estimated effects of politician salary will be biased. It is unlikely, however, that economic shocks would respect state borders. Rather, two districts on opposite sides of a state

[7]For example, Gagliarducci and Nannicini (2010) describe how high quality politicians may not wish to set themselves a high wage, as not raising their wage is an outcome of being a good leader.

border are probably more likely to face similar shocks to politicians' outside opportunities.

Shocks of this type are the motivation for the use of spatial discontinuity methods, where we analyze pairs of electoral districts straddling state borders. For this analysis, we consider regressions of the firm:

$$y_{p(d)dst} = \alpha_0 + \alpha_1 w_{st} + X_{st}\beta + f_s + f_{p(d)t} + \epsilon_{p(d)dst}$$

where $p(d)$ refers to a border district pairing and $f_{p(d)t}$ is a border district pair-year fixed effect we perform the above regression in a sample restricted to electoral districts that lie on state borders, including all pairs to which a given district belongs. Thus, districts that belong to multiple pairings will be included multiple times. As discussed by Naidu (2009), to correct the standard errors for this, multi-way clustering is used (Miller et al., 2009), clustering both across states and over the electoral district times year fixed effects.

To highlight the use of the spatial discontinuity strategy, consider a year where the wage is raised in California, but not raised in Nevada. Electoral districts in California may have also changed in other ways besides the wage change. However, it may be the case that the political equilibrium in a district in eastern California experienced many different shocks than a bordering district in western Nevada. By including the border district pair-year fixed effects, our regressions focus, for instance, on comparing elections in a district in eastern California with elections in a district in western Nevada.

4.2 Data Sources

Data on wages for legislators and governors comes from *The Book of the States.* The data on legislator wages was hand-collected from the book. We use the data from Di Tella and Fisman (2004) for the governor wage from 1950 to 1990, and hand-collected the data from 1990 to 2008. Following Di Tella and Fisman (2004), we ignore non-pecuniary benefits that politicians receive (e.g. living *per diems*, transportation expenses, etc). Governors all receive an annual salary. For legislators, we create a single annual salary figure for each state by annualizing the relevant time frame. Salaries that are given for biennial legislative sessions are divided by two to obtain an annual salary figure. Daily salaries are multiplied by the average number of days a legislature is in session over time. Information on legislative session length and legislative staff was also collected from *The Book of the States.*

Data on state legislature elections comes from ICPSR 21480, containing almost all state legislature general elections from 1967 to 2003. It includes information on the number of candidates, the margin of victory, and office term length for each contested office.[8] Data on gubernatorial primaries are from Ansolabehere et al. (2007) and were kindly provided by James Snyder. Information on

[8]Term length is believed to be a potentially important determinant of political performance. For a recent exploration of the effect of term length on politician productivity in Argentina, see Dal Bo and Rossi (2010).

term limits was obtained from the website of the Council of State Governments for state legislators and from List and Sturm (2006) for governors.

Information on electoral border districts were obtained from the website of the US census. The website provides coordinates for all state lower-house and upper-house districts, which were then read into ArcGIS. Using ArcGIS, a map was created of all districts which lay on a state boundary. These districts were then paired with the legislative districts bordering these districts in other states.

Information on characteristics of state legislatures were kindly provided by Kathleen Bratton, and are an extension of characteristics given in Bratton and Haynie (1999). This data contains information on legislators in 11 states during the last 30 years. Characteristics from governors were collected from the biographies on the website of the National Governor's Association. This information was given in paragraph form and coded into attributes by hand. The attributes of interest including gender, age, having a college degree, having a law degree, and having military experience were chosen (1) because they were straightforward to measure and (2) because they were similar to the variables provided by Bratton. Gender was coded by use of gender-specific pronouns in the biography (e.g. "he", "wife", and "her"). Age was coded up using the information on the governor's date of birth, and was defined as the governor's age upon entering office. Information on having a college degree or law degree was coded up based on the mention of this information in the biographical paragraph. Information on legislative productivity, that is, the number of bills proposed and passed was hand-collected from the Book of the States. Information here is given in terms of the number of bills during regular sessions and during special sessions (there is no division by upper and lower house). Most of our analysis focuses on using the data on bill introduction during regular sessions. Data on the partisan composition of state legislatures over time was kindly provided by Ernesto Dal Bo. Roll call voting was used from Wright (2004). Information on state spending comes from the Annual Survey of Governments from 1977 to 2001, as compiled by Greenstone (2003).

To measure the strength of political parties, we use the measures constructed by the political scientist David Mayhew, first given in Mayhew (1986). His work performs a detailed state-by- state analysis on whether political parties have historically been powerful, focusing on the degree to which local politics are run by organized party machines. All states are given a 'Total Party Organization' score from 1 to 5, and states are divided into Organization States and Non-Organization states. For our analysis, we focus on a simple binary comparison of strong and weak party states. Following the discussion in Mayhew (1986), strong party states are ones with a Total Party Organization score of 4 or 5, whereas weak party states have a Total Party Organization score of 1, 2, or 3. This is also the classification system used by Primo and Snyder (2010).[9]

[9] We are working on obtaining more updated measures of the strength of political parties.

5 Results

5.1 Effects on Electoral Competitiveness and Partisan Advantage

Table 3 shows OLS results of the effect of politician on different measures of electoral competitiveness. The effect of Log Salary on an election being contested and on the number of candidates is positive and statistically significant, though the effect is small. The coefficient on 0.025 in column 1 means that a 100% increase in the salary is associated with a 2.5 percentage point increase in the chance that the election is contested (73% of elections are contested overall). A 100% increase in salary is also associated with an increase in the number of candidates by 0.05 (the average number of candidates is 1.93). A higher salary for politicians is also associated with a smaller margin of victory and a lower chance the incumbent is re-reelected, but the effect is not statistically significant. We are able to precisely estimate the effect of salary on the number of candidates, but the effect is small compared to the effect of other variables and compared to effects observed in other countries. For example, a 100% increase in state population is associated with 0.28 more candidates. For Brazil, Ferraz and Finan (2010) find that an increase of 100% in politician salary is associated with 2.7 more candidates per election (where the baseline number of candidates per seat is 6.1).

Panels B and C of Table 3 separately examine the effects of politician salary for upper and lower house elections. Politician salary only has a statistically significant effect in lower house elections. This could occur for several reasons. For example, political parties may exercise more control over upper house election, and better be able to regulate which candidates run. In addition, there may be greater non-salary returns for running for the upper house of a state legislature compared to the lower house; thus, the calculus for citizens of whether to run or not hinges less on the official salary.

Other results in Table 3 are also of interest. First, there are statistically significant effects on politician salary on whether a Democrat is more likely to win an election. This trend was also pointed out in the earlier work of Fiorina (1994). Second, there are mechanical effects of term limits in the expected direction; term limits increase the number of contested election and the number of candidates running for election, and decrease margins of victory. Third, there does not appear to be any effect of term length on electorial competitiveness.

In all these regressions, we use log wage as the independent variable of interest. We have also run the regressions in un-logged form, using instead the salary in terms of tens of thousands of dollars. The effects of politician salary on electorial competitiveness decline in significance in their un-logged form.

Table 4 examines the same relationships using the border district methodology described above. The coefficients are positive and a little bit larger than the coefficients from the basic fixed effects analysis. The standard errors are also larger. The general pattern is basically similar to the results from the fixed effects analysis. Increased politician salary is associated with slightly greater electoral

competitiveness.

In Table 5, we analyze the effect of politician salary in gubernatorial primaries. Since the general elections for governors often have exactly two major candidates (one Democrat and one Republican), we focus on the results for gubernatorial primaries. The data shows no systematic relationship between gubernatorial salary and electoral competitiveness. The estimates are close to zero, though the standard errors are larger than before. It is important to keep in mind, however, that there is far less variation in salaries for governors than there is for state legislators. An increase in 100% for gubernatorial salary is thus a very large amount.

Table 6 turns to analyzing the impact of politician salary on various politician characteristics including candidate diversity, candidate education and occupation, and past political experience. As discussed above, the measures are used simply because they are what can be observed and clearly do not represent all relevant measures of quality. Panel A shows the effect of log salary on the characteristics of state legislators. There are no statistically significant correlations. Politician salary is actually negatively (though insignificantly) associated with the probability of the politician having a college degree. The coefficient of -0.014, and the standard error of 0.025 means that we can rule out an effect of greater than 3.6% at the 95% confidence level (in the baseline, the share of college graduates if 77%). In contrast, the estimates of Gagliarducci and Nannicini (2010) indicate that a 100% increase in salary to be associated with an Italian mayor having an additional 2.7 years of schooling.

5.2 Effects on Legislator Productivity

Table 7 presents the effect of politician salary on legislative productivity. The results are presented both with and without session length, the issue being whether one wishes to interpret session length itself as possibly reflecting productivity. [10] The effect in the different specifications is positive, but generally not statistically significant. For example, the elasticity of 0.05 estimated in column 3 indicates that a 100% increase in salary is associated with a 5 percentage point increase in the number of bills approved. The effect on the share of bills approved is positive and statistically significant, and it is not affected much by the inclusion of session length.

The outcome variables in Table 7 on bill-passing depend on factors that are likely outside the control of effort exerted by legislators. The number of bills passed likely reflects the need for passing legislation at different times; if the state government is functioning well, it may be the case that there is little need for passing new laws. The number of bills passed likely also reflects the political balance in the legislature, outside even of the share of the legislature that is Democratic or Republican. If a legislature is shapely ideologically divided, it may be difficult to pass legislation,

[10] Since session length is chosen by the legislators, one might imagine that very unmotivated legislators might choose to have short session lengths. Thus, controlling for session length, there may be no effect of log salary on session length, even though the salary is affecting their productivity.

even if all politicians exert effort.[11]

5.3 Effects on Shirking: Roll-Call Voting

Table 8 examines the effect of salary on an outcome that legislators have strong control over, namely, whether or not they miss a roll call vote. Other studies have examined whether politicians miss roll call votes or have examined similar measures of basic effort (e.g. whether or not they attend sessions of the legislature), and include Gagliarducci et al. (n.d.) and Lott (1990), with a review article given in Bender and Lott (1996). Column 2 indicates a statistically significant negative association of salary on whether legislators miss the vote. Note that this regression is based only on roll call votes from a cross-section; thus, there are no time effects, and since salary varies at the state level, there are no year fixed effects. The coefficient os -0.02 means that a 100% increase in int he salary is associated with a two percentage decrease in the probability that a legislator will miss their roll call vote (compared to a baseline missed vote percentage of 9 percent).

5.4 Threats to Identification

Above, we used a spatial discontintuity methodology to address the possibility that unobserved shocks (e.g. shocks to local lawyer salaries) may not be captured by a state's overall economic measure. By comparing an Eastern California district to a Western California district within a given year, we attempt to provide more robust comparisons of different districts.

A different threat to identification arises if changes in politicain salaries are accompanied by unobserved changes state institutions. As discussed earlier, legislatures have become more "professional" over time, with longer sessions, more staff, and full-time legislators. Although we hand-collected data on staff and session length and control for these vraiables, it is possible that other variables may have also changed, e.g. the capital buildings or the facilities inside. While we cannot eliminate this concern altogether, we use a selection on observables model (Altonji et al., 2005, 2008) as a robustness test. This model allows us to estimate the degree to which our results are driven by unobservable determinants of political selection and productivity. It relies on the assumption that politician salary has the same relationship with the part of our dependent variables that are related to our observables as it does with the part of our dependent variables that are related to any unobservables. This approach is similar to an approach used in (Gentzkow et al., 2012) in that we assume that the correlation between state-year unobservable shocks and election competition and outcomes is the same as the correlation between state-year observable shocks and our outcome variables. Given that our concern is about changes in state-year legislative unobservables, we use legislative observables to estimate the model. In particular, we use measures of legislative staff and aides, the number of meetings per year and the length of meetings. Comparing the estimate

[11] We still need to add the data on partisan control of legislatures.

of the effect of salary on the nunber of candidates when we include the full set of controls to the estimate of this effect when we do not include any controls, we find that the amount of selection on unobserved variables would have much higher than the amount of selection on observable controls. Similar ratios are found for other dependent variables.

6 Interpretation

We discuss several explanations and interpretations of our results, including (1) That salaries are too small to be meaningful to politicians, (2) That politicians are driven by intrinsic motivations, and (3) That the small impacts of salary on entry and performance are driven by political parties serving as a barrier to entry. While not conclusive, the evidence is suggestive of multi-tasking and parties serving as a barrier to entry.

Politician Salaries are too Small to be Meaningful. One explanation for our results is that politician salaries are too small to be expected to have any influence on outcomes. Potential politicians are reasonably well-educated, high-ability people, so differences in several hundred or thousand dollars are unlikely to have any significant impact on their houshold's finances, let alone their behavior as politicians.

Table 9 provides evidence of the impact of politician salary on politician's self-report income and outside labor supply. Panel A shows that politicians salaries are reflected significantly in politician family income. On average, formal salaries comprise 24% of household income and an additional dollar of household income shows up almost one-for-one in self-report earnings.

Panel B shows that increased salary decreases the chance that the politician has an outside job, which we interpret as a measure of politician labor supply. This finding is consistent with "Moonlighting Politicians" by (Gagliarducci et al., n.d.).

Intrinsic Motivations. An important body of work shows that workers are often driven primarily by intrinsic motivations instead of extrinsic rewards. The relatively small impact of salary on behaviors is consistent with this view. We show, however, that salary is strongly correlated with the way that politicians spend their time, suggesting that politicians are responsive to an important degree motivated by external incentives.

Table 10 shows results from regressions analyzing state legislator survey-reported time use. If politician salary increases political quality or accountability, one might expect that this would cause politicians to devote more time toward crafting legislation and serving constituent needs. The responses are self-reported. In addition, the scale is purely ordinal; politicians are asked to report how much time they actually spent on one of several activities going from 1='Hardly Any' to 5='A Great Deal.' Table 10 divides results into the effects of time use on non-campaign activities and campaign activities. In states where the wage is higher, politicians are actually slightly less likely to spend time studying proposed legislation, but the difference is not statistically significant.

Politician in high-wage states do report spending more time trying to address the concerns of their constituents.

One of the most striking results here, seen in Panel B of Table 10, is the positive relationship between politician salary and fundraising: In states where the wage is higher, politicians are much more likely to report spending more time fundraising. It is noteworthy that a higher wage is associated with spending more time fundraising on campaigns and fundraising for oneself. There is no relationship between the wage and fundraising for others. This is suggestive that the positive relationship between wage and fundraising is not simply an artifact of there being more fundraising opportunities in high-wage states.

Strong Political Parties. A possible mechanism for our findings is that strong political parties can act as a barrier to entry. In particular, in states with strong parties, potential candidates may not be able to respond to salary increases because, for instance, the party might decide who runs and who doesnt in addition to driving political effort and other outcomes. As a result, while individual politicians may be responsive to salary changes, the decisions of a strong party may override these incentives. Table 11 performs the regressions on electoral competitiveness and adds an interaction between log salary and an indicator for whether or not a state has strong political parties. We focus for now on two measures: The number of candidates running and the probability that the incumbent is re-elected. The results suggest that in states with weak political parties, there is a positive relationship between log salary and the number of candidates while this relationship is almost zero for strong political parties. Similarly, in weak party states, there is a negative (though insignificant) relationship between the likelihood an incumbent is re-elected and this relationship is positive (though insignificant) in strong party states. These results are consistent with strong parties being a barrier to entry.

7 Conclusion

In this paper, we examine how politician salary affects political selection and behavior in the United States. We estimate that some effects are small and positive significant, and that some effects are statistical zeroes. The main message is that effects, if they are there, are likely to be small.Comparing across electoral districts straddling state borders, there is scant evidence that an increased salary for politicians is associated with increased legislative competitiveness. Higher salary politicians are only slightly more productive than lower salary ones. This evidence is consistent with the simulations from structural models (Diermeier et al., 2005; Keane and Merlo, 2010), which also find that the effect of increasing politician salary on selection and performance is likely be small for the United States. A limitation of this paper is that the data is decidedly non-experimental; wages are not randomly assigned to different states in the United States. However, our result that politician salaries have small effects remains consistent across fixed effect and

spatial discontinuity specifications. Moreover, the amount of selection on unobservables would have to be very large to explain our results.

A central task in future research is to explore why this appears to be the case. We have provided suggestive evidence that in states classified by political scientists has having strong political parties that the effects of political parties tend to be smaller. Future work understanding how political parties affect rents for politicians and how parties regulate the political selection process would be worthwhile.

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Figure 1: Average Salary of Legislators Over Time

Figure 2: Legislator Pay Over Time By State, In Nominal Terms

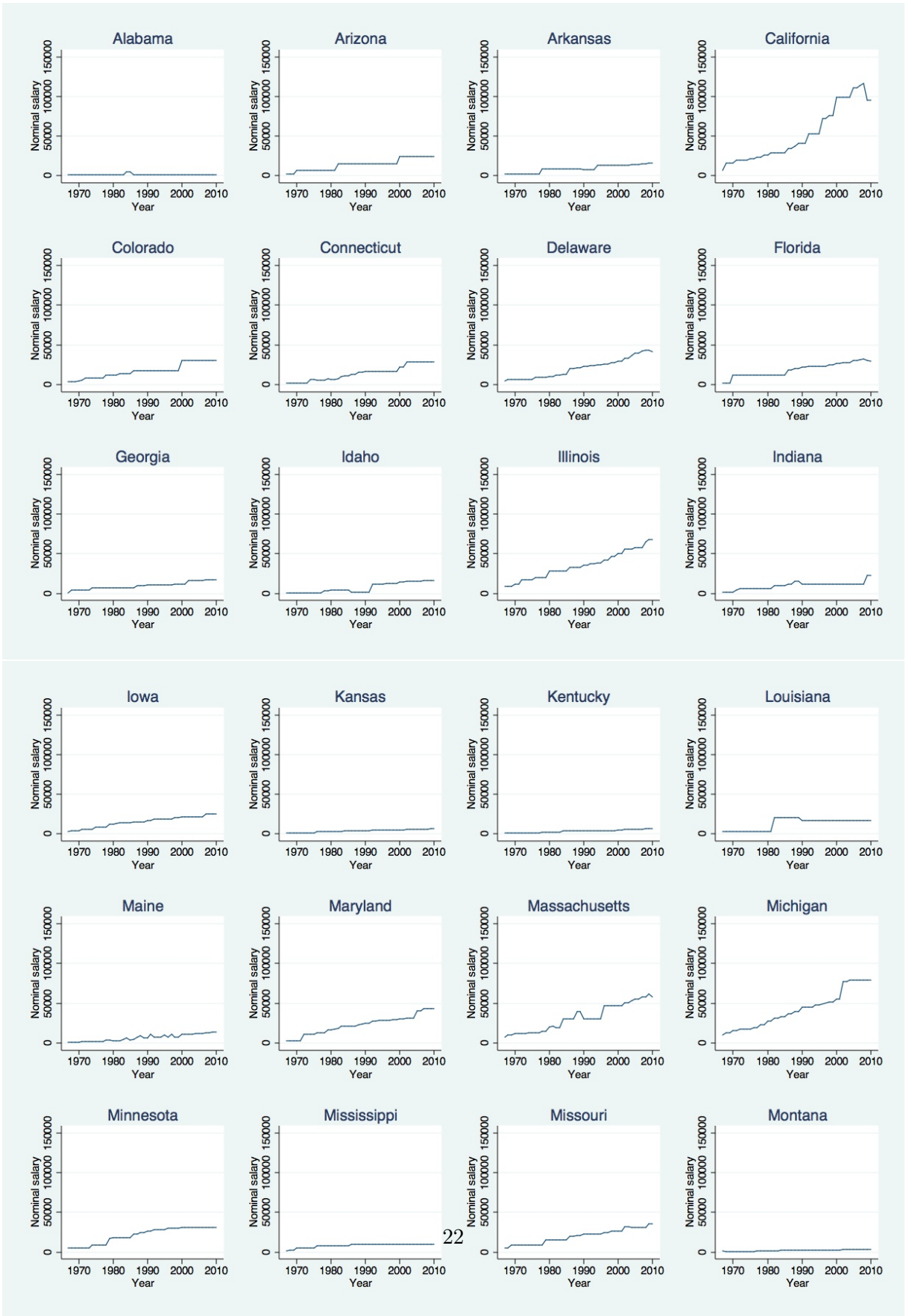


Figure 2: Legislator Pay Over Time By State, In Nominal Terms (Cont.)

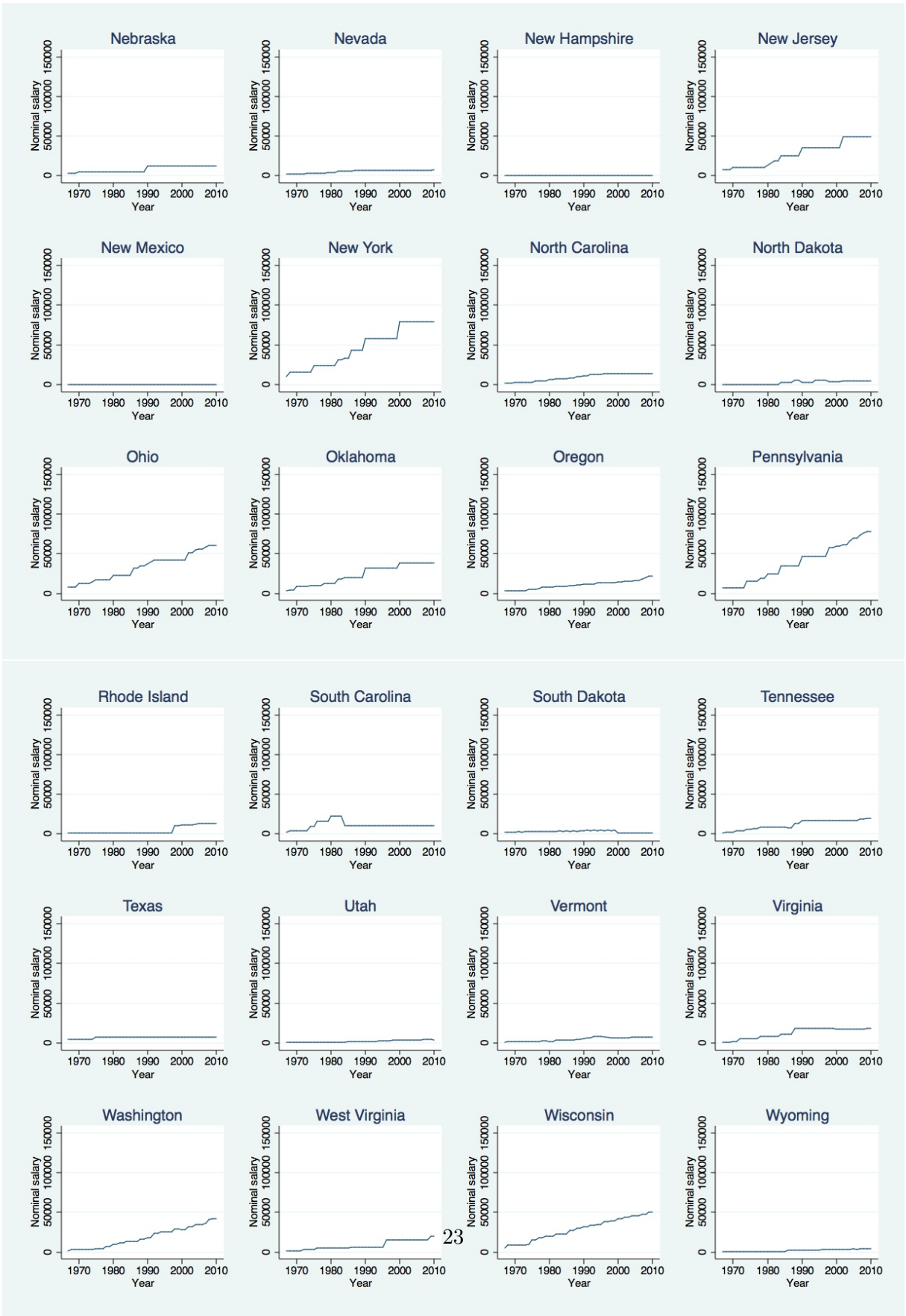
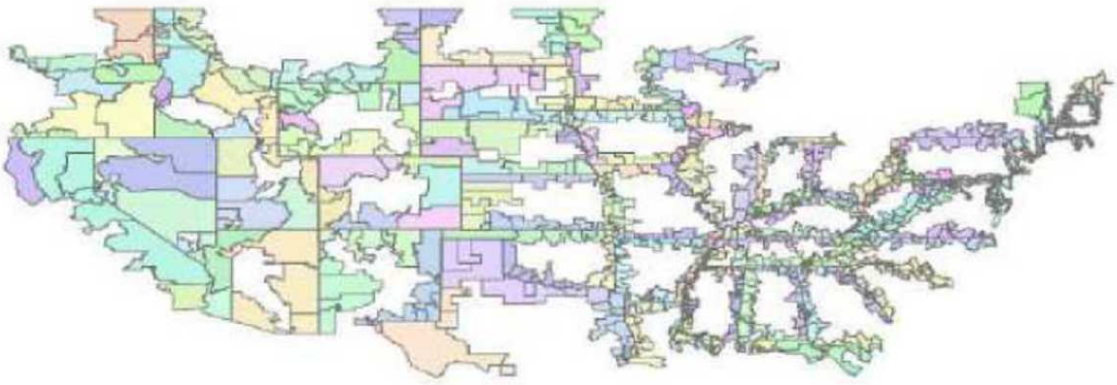


Figure 3: Lower House State Legislative Districts Lying Along State Boundaries



Source: 2006 US Census cartographic boundary file.

Table 1: Real Salary for Governors and State Legislators Over Time (1982 Dollars)

	Di Tella and Fisman (2004)		Book of the States	
State	**Governor Salary in 1950**	**Governor Salary in 1990**	**Legislator Salary in 1967**	**Legislator Salary in 2008**
Alabama	24928	53744	1142	177
Arizona	41547	57400	5389	11147
Arkansas	41547	26787	5566	6995
California	103867	65054	17964	53923
Colorado	41547	53574	9581	13934
Connecticut	49856	59696	4865	13005
Delaware	31160	61227	13473	19856
Florida	49856	77209	3593	14831
Georgia	49856	68017	1146	8055
Idaho	31160	42093	1771	7485
Illinois	49856	71380	26946	30354
Indiana	33237	55974	2038	2719
Iowa	49856	55487	7270	11612
Kansas	33237	55974	2038	2719
Kentucky	41547	53368	2398	2738
Louisiana	49856	50586	7279	7803
Maine	41547	53574	2994	5905
Maryland	16619	65054	7186	20204
Massachusetts	83094	57400	22455	27049
Michigan	93480	81654	29940	36994
Minnesota	49856	79488	14371	14463
Mississippi	41547	57859	4491	4645
Missouri	41547	67764	14371	14463
Montana	31160	39578	4444	1615
Nebraska	41547	44390	7186	5574
Nevada	31576	54229	5709	3033
New Hampshire	24928	57977	277	93
New Jersey	83094	65054	22455	22759
New Mexico	41547	68880	0	0
New York	103867	99494	29940	36925
North Carolina	62320	94136	3673	6480
North Dakota	24928	49897	485	1955
Ohio	54011	49747	23952	28139
Oklahoma	27005	53574	9220	17835
Oregon	41547	59314	8982	9235
Pennsylvania	103867	65054	21557	35375
Rhode Island	62320	52808	1082	6079
South Carolina	31160	64975	5389	4830
South Dakota	35315	46547	4491	557
Tennessee	49856	65054	1423	8417
Texas	49856	71507	14371	3344
Utah	31160	53567	1497	1835
Vermont	35315	58012	2838	3379
Virginia	62320	65054	1617	8193
Washington	62320	74008	3593	19173
West Virginia	41547	55104	4491	6967
Wisconsin	51934	65933	16168	22022
Wyoming	33237	53574	976	1893

Table 2: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
	Panel A - State Legislators				
Legislature & Election Characteristics					
Nominal salary	84,592	15420.23	15609.71	0	99,000
Contested election	86,401	0.73	0.43	0	1
Number of candidates	86,401	1.93	0.74	1	20
Number of candidates, 6 or fewer candidates	86,378	1.92	0.70	1	6
Margin of victory (percentage points)	84,043	47.04	35.51	0	100
Incumbent is re-elected	86,222	0.68	0.46	0	1
Incumbent runs for re-election	86,212	0.74	0.44	0	1
Incumbent re-elected conditional on running	63,510	0.93	0.26	0	1
Incumbent re-elected conditional on running an facing an opponent	41,312	0.90	0.30	0	1
Election won by a Democrat	85,889	0.59	0.49	0	1
Election for term-limited seat	86,404	0.06	0.24	0	1
Election for seat with four-year term length	86,404	0.18	0.38	0	1
Election for seat with two-year term length	86,404	0.82	0.38	0	1
Election for seat where pay is set by constitution	71,182	0.16	0.36	0	1
Election in a border district	86,404	0.20	0.40	0	1
Legislator Characteristics					
Female legislator	12,052	0.21	0.41	0	1
Black legislator	12,052	0.10	0.30	0	1
Latino legislator	11,978	0.06	0.23	0	1
Legislator age	11,313	49.61	11.44	19	94
College Degree	11,012	0.77	0.42	0	1
Graduate Degree	11,012	0.44	0.50	0	1
Lawyer	11,041	0.23	0.42	0	1
Has political experience	11,204	0.39	0.49	0	1
Legislature Productivity					
Number of bills introduced	1,771	2054.12	2339.15	6.00	21435.00
Number of bills introduced per legislator	1,305	13.87	12.50	0.06	101.59
Number of bills approved	1,771	467.91	337.56	0.00	2361.00
Number of bills approved per legislator	1,305	3.51	2.53	0.05	17.51
Share of bills approved	1,771	0.31	0.17	0.00	0.97
Miss a roll-call vote	3,282,096	0.09	0.28	0	1
Other					
Strong State Party	48	0.27	0.45	0	1

Table 2: Summary Statistics, Continued

Variable	Obs	Mean	Std. Dev.	Min	Max
		Panel B - State Governors			
Real Salary (in 1982 dollars)	1,326	61,035	19,714	16,598	172,414
Gubernatorial Primary Election Characteristics					
Contested election	1,323	0.80	0.40	0	1
Number of candidates	1,325	3.12	2.17	1	18
Number of candidates, 6 or fewer candidates	1,232	2.70	1.43	1	6
Margin of victory (percentage points)	1,325	0.46	0.36	0	1
Margin of victory (percentage points), contested election	1,062	0.33	0.27	0	1
Election for term-limited seat	1,326	0.50	0.50	0	1
Governor Characteristics					
Female governor	344	0.03	0.16	0	1
Governor age	344	48.30	8.03	33	71
College degree	344	0.95	0.22	0	1
Lawyer	343	0.55	0.50	0	1
Has military experience	344	0.58	0.49	0	1
Born out of state	344	0.30	0.46	0	1
Worked in private sector after office	231	0.44	0.50	0	1
Worked in public sector after office	231	0.60	0.49	0	1
Retired after office	231	0.05	0.21	0	1
Gubernatorial Candidate Characteristics					
Female candidate	600	0.05	0.21	0	1
Candidate age					
College degree	429	0.95	0.23	0	1
Graduate degree	379	0.66	0.47	0	1
Lawyer	423	0.52	0.50	0	1
Has military experience	417	0.56	0.50	0	1
Born out of state	427	0.34	0.47	0	1
Worked in private sector after office	310	0.69	0.46	0	1
Worked in public sector after office	382	0.52	0.50	0	1
Retired after office					

Table 3: The Effect of Legislative Salary on Electoral Competitiveness and Electoral Outcomes

	All Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.026**	0.050**	-0.747	-0.015	0.066**
	(0.013)	(0.020)	(1.199)	(0.013)	(0.025)
Upper house	0.070***	0.114***	-3.546**	-0.017	-0.013
	(0.021)	(0.031)	(1.526)	(0.011)	(0.022)
Session length in election year (in hundreds of days)	0.011	0.015	-0.191	0.008	0.020
	(0.014)	(0.028)	(0.948)	(0.010)	(0.012)
Election for term-limited seat	0.068**	0.109*	-3.494	-0.142***	0.019
	(0.032)	(0.062)	(2.708)	(0.030)	(0.035)
Election for seat with four year term length	-0.023	-0.026	-0.576	-0.110***	0.018
	(0.023)	(0.033)	(1.665)	(0.016)	(0.026)
Observations	82,533	82,447	80,248	82,353	82,027
R-squared	0.161	0.175	0.162	0.141	0.143
Mean dep var	0.734	1.933	47.04	0.685	0.590

	Lower House Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.039**	0.070***	-1.041	-0.020	0.071**
	(0.017)	(0.026)	(1.615)	(0.016)	(0.033)
Session length in election year (in hundreds of days)	0.014	0.015	-0.076	0.013	0.024*
	(0.017)	(0.032)	(1.088)	(0.010)	(0.013)
Election for term-limited seat	0.088**	0.131*	-4.831	-0.143***	0.020
	(0.034)	(0.067)	(2.965)	(0.033)	(0.035)
Election for seat with four year term length	-0.102*	0.251**	-9.551	-0.173***	0.407***
	(0.053)	(0.114)	(12.284)	(0.061)	(0.149)
Observations	62,733	62,673	60,870	62,579	62,325
R-squared	0.168	0.181	0.167	0.141	0.137
Mean dep var	0.719	1.908	48.30	0.706	0.597

	Upper House Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.006	0.019	-0.388	-0.003	0.053***
	(0.011)	(0.019)	(1.424)	(0.012)	(0.019)
Session length in election year (in hundreds of days)	-0.001	0.014	-1.039	0.004	0.008
	(0.014)	(0.029)	(1.224)	(0.017)	(0.015)
Election for term-limited seat	-0.006	0.020	1.000	-0.133***	0.022
	(0.037)	(0.060)	(3.480)	(0.033)	(0.039)
Election for seat with four year term length	-0.026	-0.022	0.837	0.005	0.023*
	(0.026)	(0.038)	(1.007)	(0.030)	(0.013)
Observations	19,800	19,774	19,378	19,774	19,702
R-squared	0.145	0.167	0.150	0.149	0.175
Mean dep var	0.782	2.011	43.05	0.617	0.565

Notes: This table anlayzes the effect of legislative salary on candidate selection using US state legislative elections from 1967-2003. An observation is an election. Robust standard errors clustered by state in parentheses. All regressions include state and year fixed effects. The contested election variable is a dummy for whether the election had more than one candidate. Column 2 is restricted to elections with 6 or fewer candidates. Log salary is the logarithm of the real salary in 1982 dollars.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: The Effect of Legislative Salary on Electoral Competitiveness and Electoral Outcomes, Analysis for Border Districts

	All Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.060	0.060	-4.075	0.042	0.049
	(0.046)	(0.071)	(3.269)	(0.047)	(0.043)
Session length in election year (in hundreds of days)	0.036	0.030	1.494	0.014	-0.015
	(0.046)	(0.059)	(2.748)	(0.034)	(0.045)
Election for term-limited seat	0.146*	0.209**	-10.796	-0.260***	-0.098
	(0.077)	(0.081)	(7.819)	(0.076)	(0.087)
Election for seat with four year term length	0.048	0.096	-8.793	-0.035	0.008
	(0.056)	(0.069)	(6.360)	(0.065)	(0.103)
Observations	39,078	39,021	38,133	39,007	38,908
R-squared	0.789	0.823	0.805	0.799	0.809
Mean dep var	0.720	1.917	48.47	0.685	0.611

	Lower House Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.084	0.113	-6.630	-0.004	0.048
	(0.069)	(0.092)	(5.347)	(0.039)	(0.064)
Session length in election year (in hundreds of days)	0.036	0.009	2.024	0.022	-0.011
	(0.040)	(0.055)	(2.788)	(0.037)	(0.047)
Election for term-limited seat	0.194**	0.266***	-13.073	-0.261***	-0.089
	(0.079)	(0.086)	(8.098)	(0.085)	(0.098)
Election for seat with four year term length	0.029	0.156	46.796	-0.253	-0.181
	(0.625)	(0.756)	(38.294)	(0.302)	(0.659)
Observations	26,113	26,084	25,340	26,063	25,995
R-squared	0.772	0.801	0.790	0.773	0.791
Mean dep var	0.697	1.874	49.78	0.714	0.625

	Upper House Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.037	-0.012	-0.611	0.129**	0.038
	(0.049)	(0.074)	(4.673)	(0.060)	(0.055)
Session length in election year (in hundreds of days)	0.031	0.123	-0.503	-0.036	-0.007
	(0.081)	(0.139)	(5.295)	(0.095)	(0.080)
Election for term-limited seat	0.010	0.015	-3.800	-0.214**	-0.149
	(0.126)	(0.184)	(14.057)	(0.093)	(0.130)
Election for seat with four year term length	0.000	-0.018	4.827	0.037	0.002
	(0.082)	(0.114)	(5.452)	(0.120)	(0.097)
Observations	12,965	12,937	12,793	12,944	12,913
R-squared	0.842	0.873	0.851	0.846	0.863
Mean dep var	0.765	2.003	45.86	0.626	0.584

Notes: This table anlayzes the effect of legislative salary on candidate selection using US state legislative elections from 1967-2003, restricting to elections in districts on state borders. An observation is an election. Robust standard errors clustered by state in parentheses. All regressions include border district pair-year fixed effects (e.g. fixed effect for elections in District A in eastern California and District B in western Nevada in 1970) and state fixed effects. The contested election variable is a dummy for whether the election had more than one candidate. Column 2 is restricted to elections with 6 or fewer candidates. Log salary is the logarithm of the real salary in 1982 dollars.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: The Effect of Legislative Salary on Electoral Competitiveness and Electoral Outcomes, Gubernatorial Elections

	All Primaries			
	(1)	(2)	(3)	(4)
	Contested Election	Number of Candidates	Margin of Victory (in percentage points)	Margin of Victory for Contested elections (in percentage points)
Log salary	0.006	0.061	0.427	0.014
	(0.084)	(0.212)	(7.895)	(5.270)
Democratic primary	0.072	0.373***	-8.336**	-4.962**
	(0.047)	(0.124)	(4.084)	(2.140)
Election for term-limited seat	0.062	0.409**	-10.801**	-6.578
	(0.053)	(0.155)	(5.335)	(5.723)
Observations	895	895	895	645
R-squared	0.206	0.298	0.181	0.182
Mean dep var	0.743	2.564	48.40	32.16

	Democratic Primaries			
	(1)	(2)	(3)	(4)
	Contested Election	Number of Candidates	Margin of Victory (in percentage points)	Margin of Victory for Contested elections (in percentage points)
Log salary	0.021	-0.068	-2.810	-3.637
	(0.096)	(0.289)	(9.338)	(6.565)
Election for term-limited seat	0.084	0.355**	-11.853	-6.165
	(0.074)	(0.146)	(9.456)	(10.312)
Observations	463	463	463	352
R-squared	0.331	0.415	0.303	0.230
Mean dep var	0.768	2.713	44.92	29.84

	Republican Primaries			
	(1)	(2)	(3)	(4)
	Contested Election	Number of Candidates	Margin of Victory (in percentage points)	Margin of Victory for Contested elections (in percentage points)
Log salary	-0.015	0.240	3.329	-2.784
	(0.143)	(0.293)	(11.130)	(8.956)
Election for term-limited seat	0.028	0.402	-8.262	-5.539
	(0.099)	(0.258)	(12.929)	(11.819)
Observations	432	432	432	293
R-squared	0.273	0.361	0.254	0.296
Mean dep var	0.716	2.406	52.10	34.82

Notes: This table anlayzes the effect of legislative salary on candidate selection using gubernatorial primary elections from 1950-1994. An observation is an election. Robust standard errors clustered by state in parentheses. All regressions include state and year fixed effects. The contested election variable is a dummy for whether the election had more than one candidate. Salary is given in terms of 1982 prices.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: State Politician Salary and Politician Characteristics

Panel A - State Legislative Salary and Legislator Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Female	Black	Latino	Age	College Degree	Has Political Lawyer	Experience
Log salary	0.024	-0.017	0.027	-0.615	-0.019	0.015	0.016
	(0.015)	(0.010)	(0.023)	(0.775)	(0.024)	(0.021)	(0.027)
Election for term-limited seat	-0.029	-0.004	0.026	-3.110***	-0.009	0.000	0.040
	(0.022)	(0.012)	(0.024)	(0.755)	(0.016)	(0.013)	(0.029)
Session length in election year	-0.005	0.001	0.004	0.133	0.001	-0.021*	-0.018
(in hundreds of days)	(0.010)	(0.005)	(0.011)	(0.424)	(0.020)	(0.010)	(0.021)
Observations	9,904	9,903	9,839	9,286	8,981	9,000	9,094
R-squared	0.034	0.017	0.076	0.077	0.025	0.032	0.084
Mean dep var	0.208	0.100	0.0571	49.61	0.771	0.235	0.391

Panel B - Governor Salary and Governor Characteristics

	(1)	(2)	(3)	(4)	(5)
	Female	Age	College Degree	Lawyer	Has Political Experience
Log salary	-0.016	4.267*	-0.040	-0.153	0.202
	(0.048)	(2.228)	(0.053)	(0.176)	(0.155)
Election for term-limited seat	-0.060	-1.492	0.026	-0.013	0.229
	(0.043)	(3.274)	(0.063)	(0.243)	(0.169)
Observations	326	326	326	325	326
R-squared	0.180	0.215	0.254	0.170	0.217
Mean dep var	0.0262	48.30	0.948	0.545	0.581

Notes: Panel A anlayzes the effect of legislative salary on candidate selection using US state legislative elections from 1967-2003. Paenl B analyzes the effect of gubernatorial salary on candidate selection using gubernatorial primaries from 1950-1990. An observation is one candidate. Panel A is restricted to data from 11 states, whereas Panel B contains data from all states. Robust standard errors clustered by state in parentheses. All regressions include state and year fixed effects.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: The Effect of Legislative Salary on Legislative Productivity

	Log(Number of Bills Introduce)		Log(Number of Bills Approved)		Share of Bills Approved	
	(1)	(2)	(3)	(4)	(5)	(6)
Log salary	0.017	0.004	0.047	0.034	0.013*	0.013*
	(0.036)	(0.037)	(0.040)	(0.040)	(0.007)	(0.007)
Session length in election year (in hundreds of days)		0.215*		0.242**		0.012
		(0.119)		(0.114)		(0.012)
Election for term-limited seat	0.047	0.084	0.343***	0.378***	0.080***	0.081***
	(0.077)	(0.079)	(0.101)	(0.106)	(0.019)	(0.019)
Observations	1,467	1,463	1,466	1,462	1,467	1,463
R-squared	0.777	0.783	0.639	0.648	0.679	0.680
Mean dep var	7.269	7.269	5.897	5.897	0.309	0.309

Notes: This table anlayzes the effect of legislative salary on legsiative productivity using data from 1968-2007. Robust standard errors in parentheses. All regressions include state and year fixed effects. An observation is a legislature-year. Observations are missing for some states in some years due to missing data on bills introduced and enacted. Robust standard errors clustered by state in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Legislative Salary and Missed Roll Call Votes

	Missed Vote	
	(1)	(2)
Log salary	-0.008	-0.023***
	(0.008)	(0.006)
Session length in election year (in hundreds of days)		0.008
		(0.016)
Biennial session frequency		-0.087***
		(0.016)
Any personal staff		0.031*
		(0.017)
Any shared staff		0.048**
		(0.019)
Any district staff		0.018
		(0.021)
Observations	3,282,096	3,282,096
R-squared	0.002	0.025
Mean dep var	0.0897	0.0897

Notes: This table analyzes the effect of legislative salary on missed roll call votes using OLS. Standard errors clustered by state in parentheses. An observation is a roll call vote for one legislator in 1999-2000. The roll call vote data does not indicate whether the vote took place in 1999 or 2000; the salary date is from 2000, and is merged to all observations from a corresponding state. South, Northeast, and Midwest are census regions (West is excluded).

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: Legislative Salary, Family Income, and Outside Labor Supply

Dep Var:	Family Income			
	(1)	(2)	(3)	(4)
Total salary (in dollars)	0.643***	0.413***	0.589***	0.356***
	(0.120)	(0.133)	(0.127)	(0.130)
Session length in election year (in hundreds of days)		-3,588.274*		-2,394.751
		(2,119.146)		(1,933.785)
Year fixed effects	No	No	Yes	Yes
Observations	5,703	5,703	5,703	5,703
R-squared	0.04	0.11	0.05	0.11
Mean dep var	101394	101394	101394	101394
Dep Var:	Outside Job			
	(1)	(2)	(3)	(4)
Total salary (in thousands of dollars)	-0.006***	-0.004***	-0.006***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Session length in election year (in hundreds of days)		-0.042**		-0.052**
		(0.020)		(0.021)
Year fixed effects	No	No	Yes	Yes
Observations	5,539	5,539	5,539	5,539
R-squared	0.07	0.09	0.07	0.09
Mean dep var	0.651	0.651	0.651	0.651

Notes: OLS regressions with standard errors clustered by state in parentheses. The data is from the surveys of state legislators done by Carey et al. (1995) and Carey et al. (2002).

Table 10: Politician Salary and Time Use

Panel A: Legislative Activities

	(1)	(2)	(3)	(4)
	Studying proposed legislation	**Developing new legislation**	**Building coalitions within party**	**Building coalition across parties**
Total salary (in thousands)	-0.023	0.034	-0.011	-0.041***
	(0.017)	(0.021)	(0.016)	(0.015)
Session length in election year	-0.008	-0.129**	0.029	-0.115***
(in hundreds of days)	(0.046)	(0.048)	(0.051)	(0.040)
Observations	2,869	2,859	2,832	2,844
R-squared	0.019	0.053	0.003	0.018
Mean dep var	3.589	3.277	3.309	3.151

Panel B: Constituent Services

	(5)	(6)	(7)
	Keeping in touch with constituents	**Helping constituents with problems**	**Making sure the district gets a fair share**
Total salary (in thousands)	0.040*	0.046*	0.057**
	(0.022)	(0.024)	(0.026)
Session length in election year	0.112*	0.078	0.100
(in hundreds of days)	(0.060)	(0.065)	(0.077)
Observations	2,854	2,859	2,867
R-squared	0.093	0.103	0.104
Mean dep var	3.589	4.042	3.466

Panel C: Fundraising

	(8)	(9)	(10)
	Campaigning and fundraising	**Fundraising for self**	**Fundraising for caucus**
Total salary (in thousands)	0.057***	0.084***	0.031
	(0.020)	(0.027)	(0.028)
Session length in election year	-0.014	0.030	-0.090
(in hundreds of days)	(0.044)	(0.066)	(0.080)
Observations	2,857	2,799	2,735
R-squared	0.087	0.103	0.034
Mean dep var	3.589	2.815	2.070

Note: OLS regressions with standard errors clustered by state in parentheses. The dependent variable in each regression is a measure from 1 to 5 of the amount of time a politician spends with each activity. The question was "How much time do you actually spend on each of the following activities?" with 1=Hardly Any to 5=Great Deal. Data is from the survey of Carey et al. (2002).

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 11: The Effect of Legislative Salary on Electoral Competitiveness and Electoral Outcomes, Effects By Party Strength (Mayhew Ratings)

	All Elections				
	(1) Contested Election	(2) Number of Candidates	(3) Margin of Victory	(4) Incumbent Re-elected	(5) Democrat Wins
Log salary	0.040**	0.066**	-3.062*	-0.025	0.086**
	(0.018)	(0.025)	(1.795)	(0.017)	(0.032)
Strong party * Log salary	-0.034	-0.038	5.396**	0.024	-0.046
	(0.023)	(0.046)	(2.013)	(0.016)	(0.038)
Observations	82,533	82,447	80,248	82,353	82,027
R-squared	0.162	0.176	0.164	0.141	0.144
Mean dep var	0.734	1.933	47.04	0.685	0.590

	Lower House Elections				
	(1) Contested Election	(2) Number of Candidates	(3) Margin of Victory	(4) Incumbent Re-elected	(5) Democrat Wins
Log salary	0.056**	0.097***	-3.401	-0.034*	0.096**
	(0.024)	(0.032)	(2.288)	(0.020)	(0.039)
Strong party * Log salary	-0.038	-0.057	4.916**	0.031*	-0.054
	(0.027)	(0.049)	(2.346)	(0.017)	(0.041)
Observations	62,733	62,673	60,870	62,579	62,325
R-squared	0.168	0.181	0.168	0.141	0.138
Mean dep var	0.719	1.908	48.30	0.706	0.597

	Upper House Elections				
	(1) Contested Election	(2) Number of Candidates	(3) Margin of Victory	(4) Incumbent Re-elected	(5) Democrat Wins
Log salary	0.018	0.021	-2.864	-0.007	0.064**
	(0.016)	(0.024)	(1.802)	(0.016)	(0.026)
Strong party * Log salary	-0.032	-0.004	6.785***	0.012	-0.031
	(0.022)	(0.050)	(1.766)	(0.028)	(0.033)
Observations	19,800	19,774	19,378	19,774	19,702
R-squared	0.146	0.167	0.153	0.149	0.175
Mean dep var	0.782	2.011	43.05	0.617	0.565

Notes: This table anlayzes the effect of legislative salary on candidate selection using US state legislative elections from 1967-2003. An observation is an election. Robust standard errors clustered by state in parentheses. All regressions include state and year fixed effects. The contested election variable is a dummy for whether the election had more than one candidate. Column 2 is restricted to elections with 6 or fewer candidates.

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure A1: Legislator Pay Over Time By State, In Real Terms

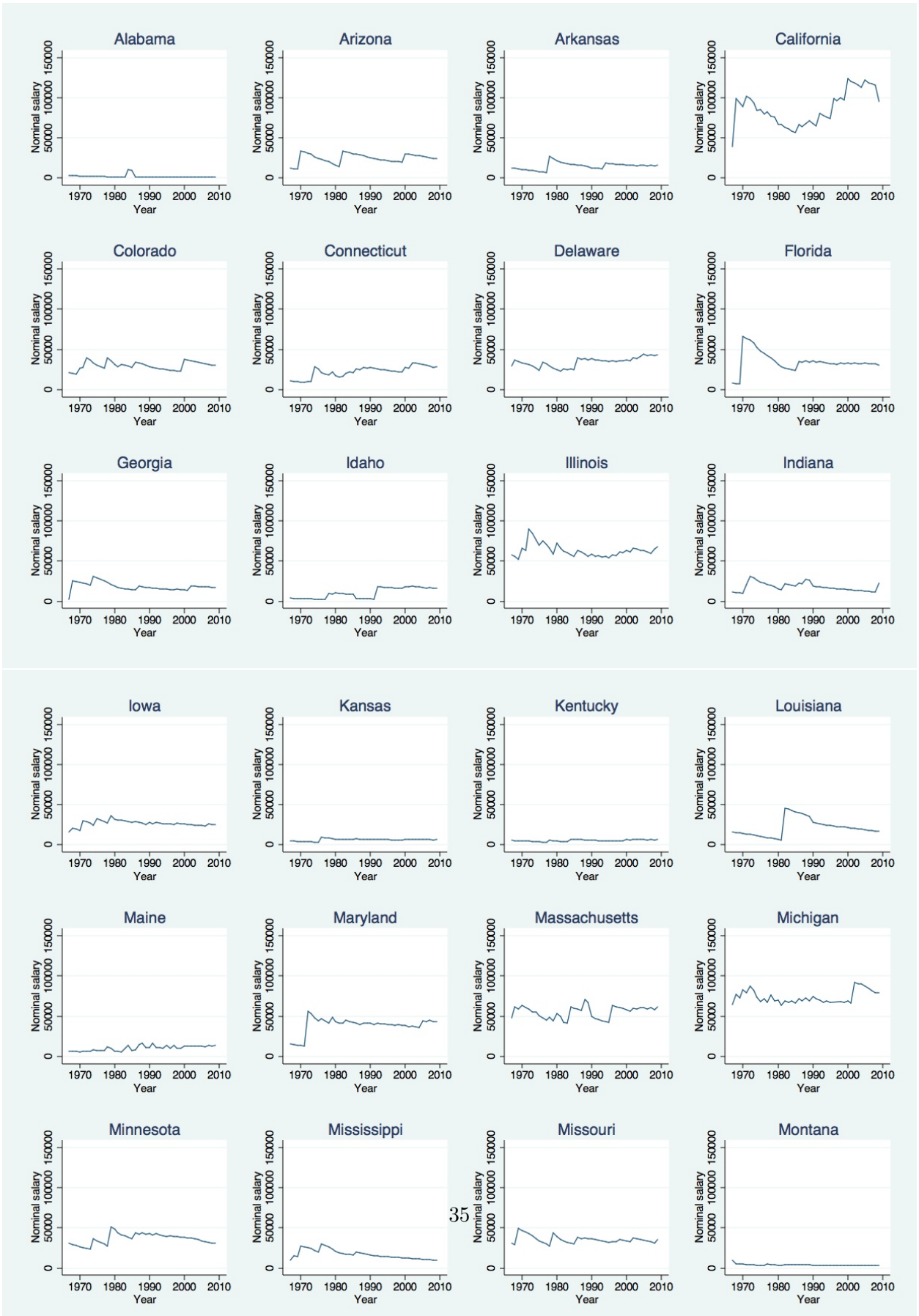


Figure A1: Legislator Pay Over Time By State, In Real Terms (Cont.)

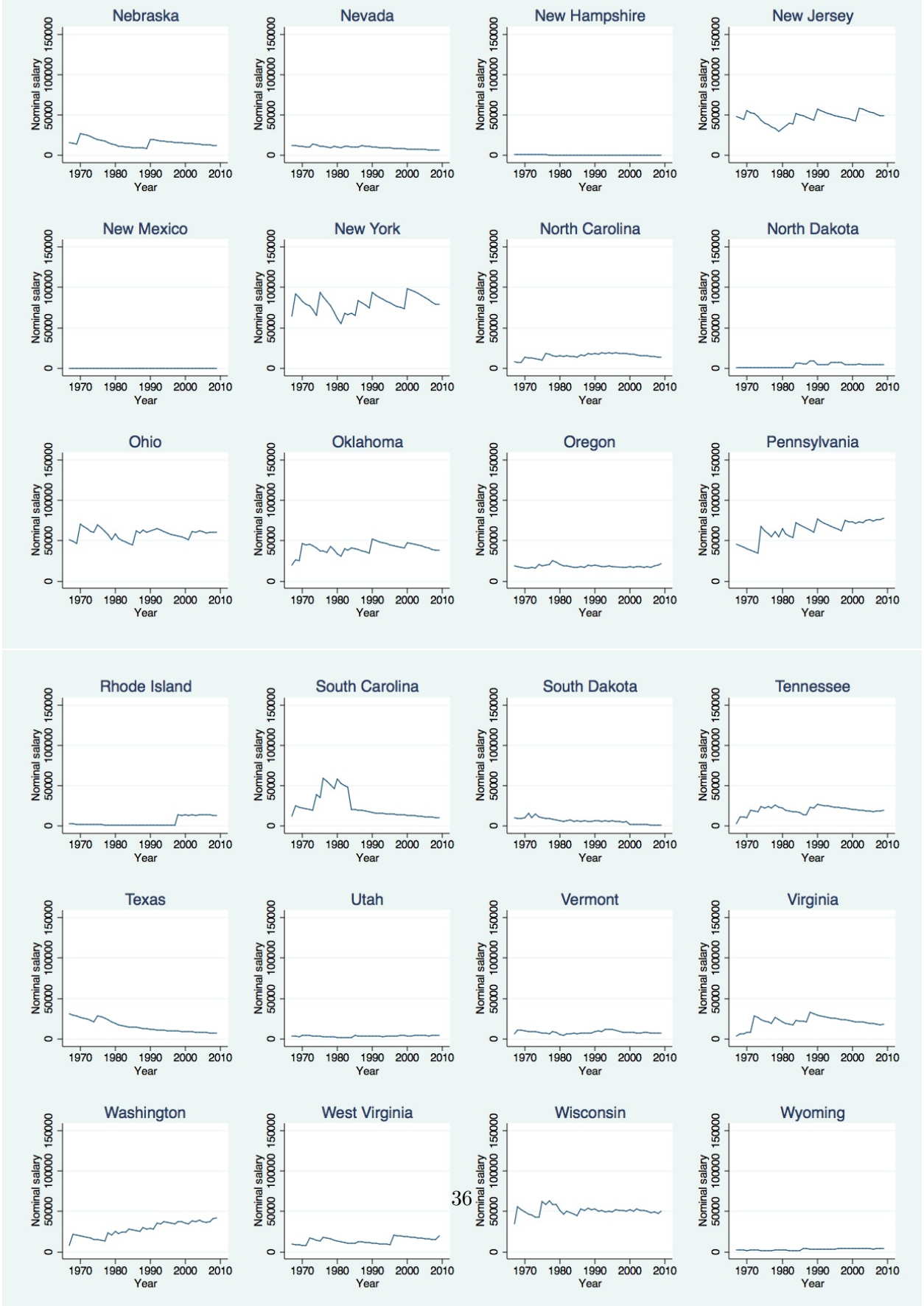


Figure A2: Legislative Session Length Over Time By State

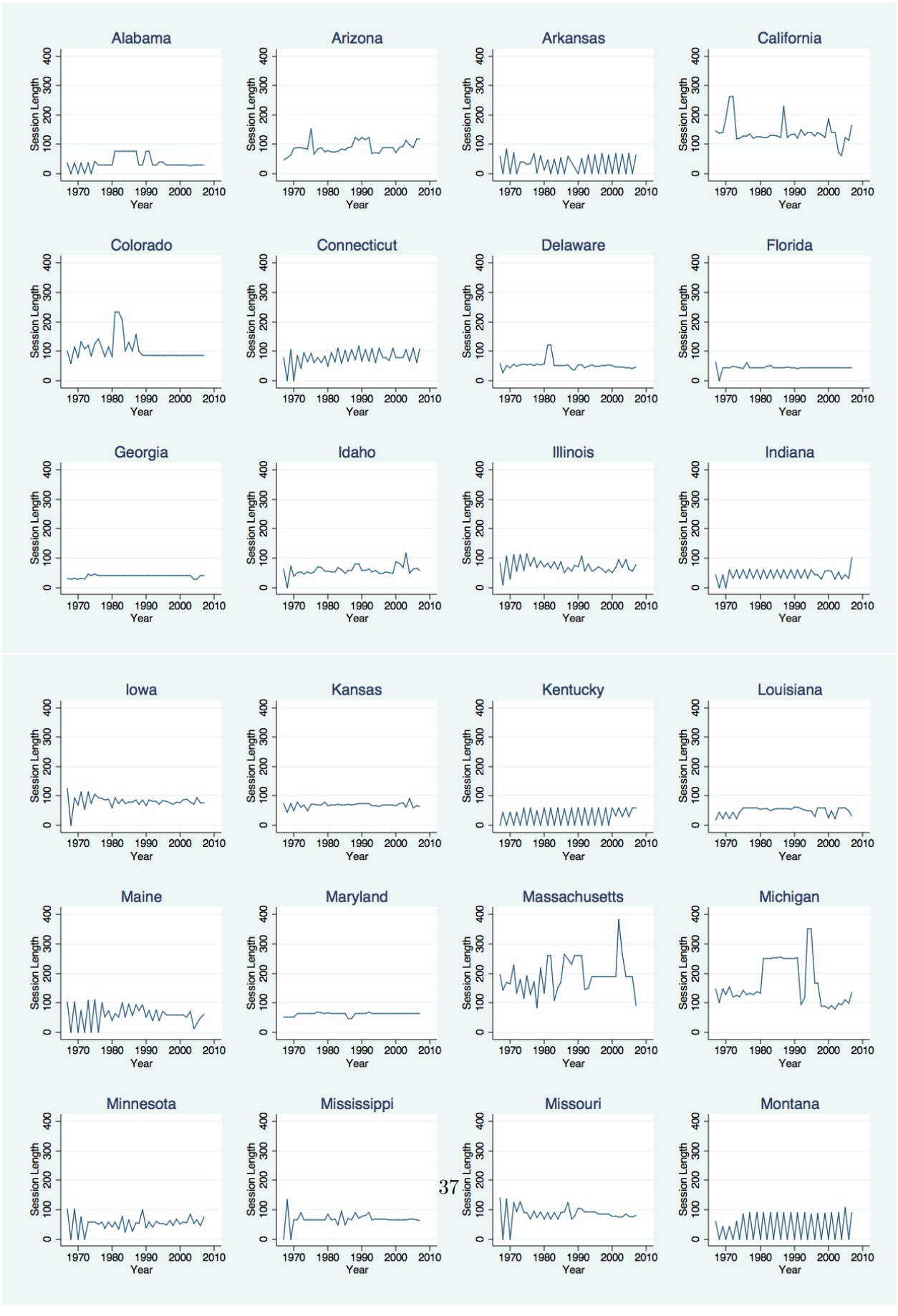


Figure A2: Legislative Session Length Over Time By State (Cont.)

Figure A3: Productivity Over Time, Number Of Bills Introduced and Passed

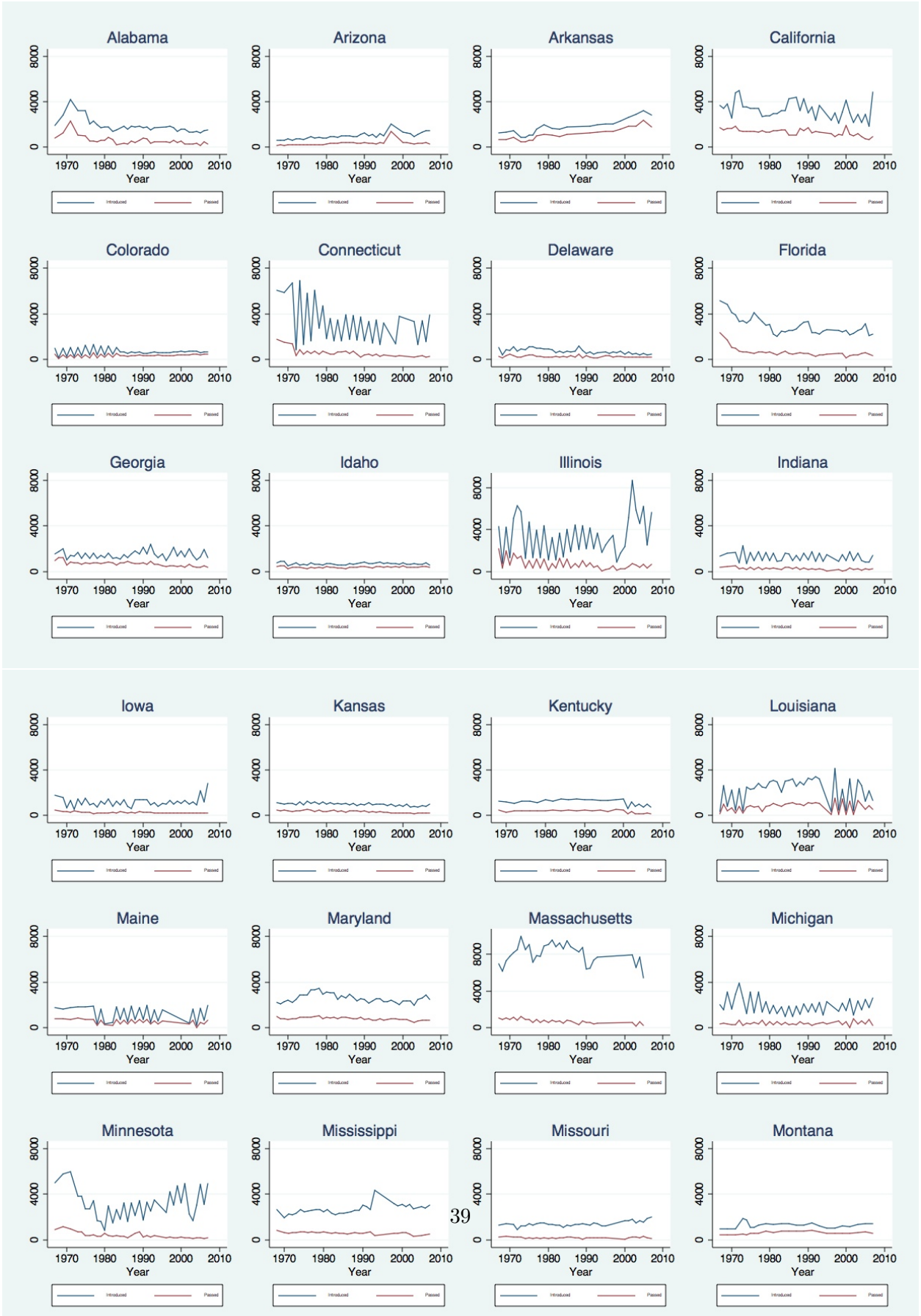


Figure A3: Legislative Productivity Over Time, Number Of Bills Introduced and Passed (Cont.)

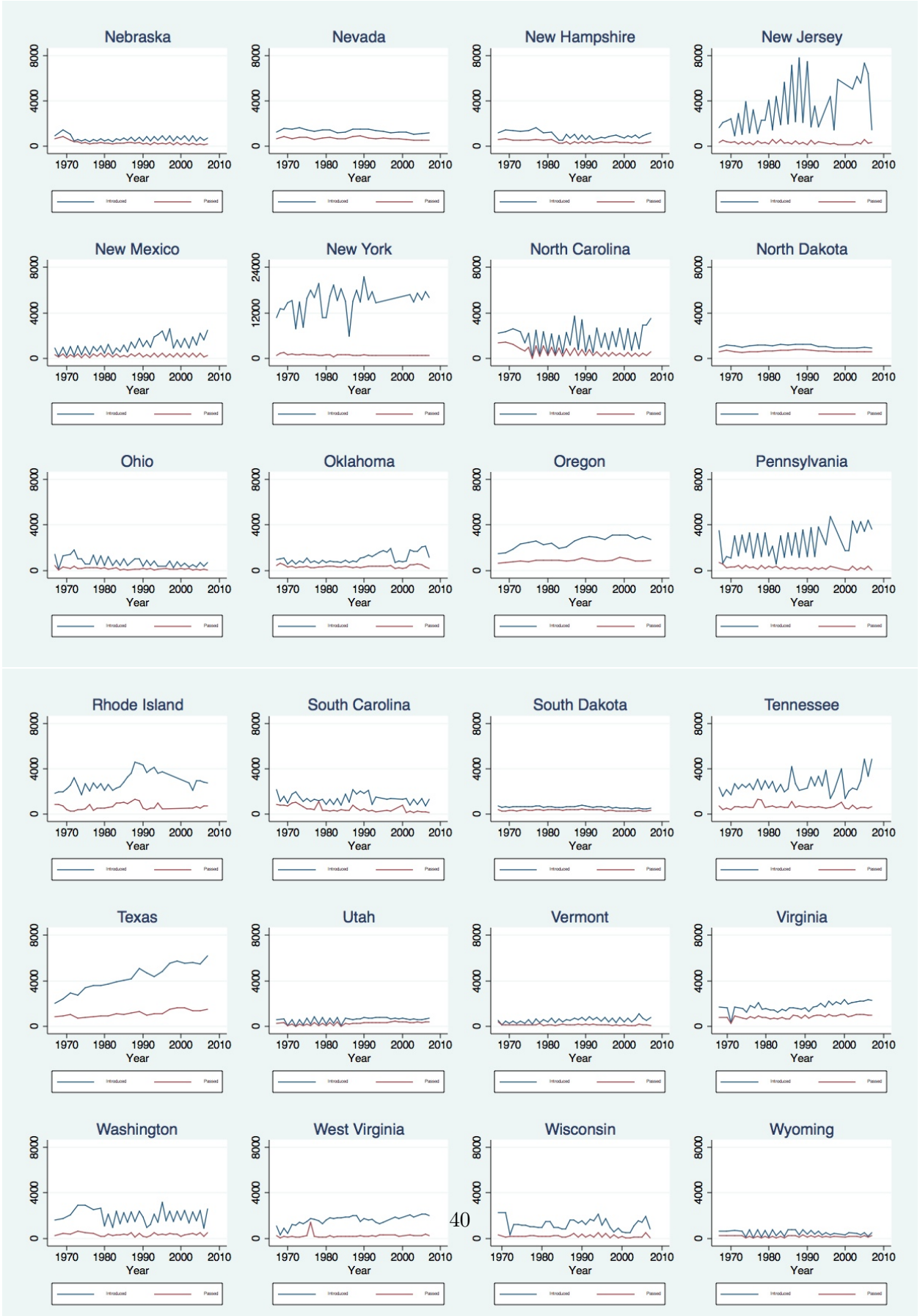


Table A4: The Effect of Legislative Salary on Electoral Competitiveness and Electoral Outcomes with State-Specific Year Trends

	All Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.031**	0.055***	-0.903	-0.007	0.062**
	(0.012)	(0.020)	(1.227)	(0.010)	(0.025)
Upper house	0.070***	0.114***	-3.557**	-0.017	-0.013
	(0.021)	(0.031)	(1.525)	(0.011)	(0.022)
Session length in election year (in hundreds of days)	0.011	0.015	-0.238	0.009	0.019
	(0.014)	(0.028)	(0.950)	(0.010)	(0.012)
Election for term-limited seat	0.070**	0.111*	-3.533	-0.139***	0.018
	(0.032)	(0.062)	(2.726)	(0.030)	(0.035)
Election for seat with four year term length	-0.023	-0.026	-0.561	-0.111***	0.018
	(0.022)	(0.033)	(1.664)	(0.015)	(0.026)
Observations	82,533	82,447	80,248	82,353	82,027
R-squared	0.162	0.176	0.162	0.142	0.144
Mean dep var	0.734	1.933	47.04	0.685	0.590

	Lower House Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.044***	0.074***	-0.957	-0.012	0.067**
	(0.016)	(0.026)	(1.666)	(0.012)	(0.033)
Session length in election year (in hundreds of days)	0.015	0.015	-0.066	0.014	0.023*
	(0.017)	(0.032)	(1.093)	(0.010)	(0.013)
Election for term-limited seat	0.090**	0.132*	-4.803	-0.141***	0.018
	(0.034)	(0.067)	(2.967)	(0.032)	(0.036)
Election for seat with four year term length	-16.077***	-10.029**	-192.811	-22.822***	12.813**
	(3.120)	(4.209)	(281.242)	(2.446)	(4.770)
Observations	62,733	62,673	60,870	62,579	62,325
R-squared	0.168	0.181	0.167	0.142	0.137
Mean dep var	0.719	1.908	48.30	0.706	0.597

	Upper House Elections				
	(1)	(2)	(3)	(4)	(5)
	Contested Election	Number of Candidates	Margin of Victory	Incumbent Re-elected	Democrat Wins
Log salary	0.012	0.027	-0.848	0.004	0.051***
	(0.011)	(0.018)	(1.437)	(0.010)	(0.017)
Session length in election year (in hundreds of days)	0.000	0.016	-1.234	0.006	0.005
	(0.014)	(0.028)	(1.220)	(0.018)	(0.014)
Election for term-limited seat	-0.003	0.024	0.832	-0.129***	0.023
	(0.037)	(0.060)	(3.532)	(0.033)	(0.038)
Election for seat with four year term length	-0.026	-0.022	0.868	0.005	0.024*
	(0.026)	(0.038)	(0.992)	(0.030)	(0.013)
Observations	19,800	19,774	19,378	19,774	19,702
R-squared	0.146	0.167	0.151	0.150	0.177
Mean dep var	0.782	2.011	43.05	0.617	0.565

Notes: This table anlayzes the effect of legislative salary on candidate selection using US state legislative elections from 1967-2003. An observation is an election. Robust standard errors clustered by state in parentheses. All regressions include state and year fixed effects. The contested election variable is a dummy for whether the election had more than one candidate. Column 2 is restricted to elections with 6 or fewer candidates. Log salary is the logarithm of the real salary in 1982 dollars.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table A5: The Effect of Legislative Salary on Legislative Productivity with State-Specific Year Trends

	Log(Number of Bills Introduce)		Log(Number of Bills Approved)		Share of Bills Approved	
	(1)	(2)	(3)	(4)	(5)	(6)
Log salary	0.010	-0.002	0.049	0.014	0.003	0.003
	(0.042)	(0.040)	(0.040)	(0.043)	(0.007)	(0.007)
Session length in election year (in hundreds of days)		0.250*		0.247*		0.002
		(0.127)		(0.126)		(0.010)
Election for term-limited seat	0.042	0.099	0.340***	0.121	-0.001	-0.001
	(0.059)	(0.077)	(0.101)	(0.084)	(0.017)	(0.017)
Observations	1,467	1,463	1,466	1,462	1,467	1,463
R-squared	0.805	0.812	0.640	0.712	0.742	0.742
Mean dep var	7.269	7.269	5.897	5.897	0.309	0.309

Notes: This table anlayzes the effect of legislative salary on legsiative productivity using data from 1968-2007. Robust standard errors in parentheses. All regressions include state and year fixed effects. An observation is a legislature-year. Observations are missing for some states in some years due to missing data on bills introduced and enacted. Robust standard errors clustered by state in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table A6: Robustness to Controlling for Legislature Characteristics

All Elections

	Contested			Number of Candidates			Margin of Victory		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log salary	0.025**	0.026**	0.026**	0.046**	0.052**	0.052***	0.014	-0.730	-0.685
	(0.012)	(0.013)	(0.012)	(0.020)	(0.020)	(0.018)	(1.399)	(1.187)	(1.144)
Session length in election year (in hundreds of days)			0.009			0.022			0.118
			(0.013)			(0.025)			(0.885)
Any personal staff			0.034			0.046			-0.933
			(0.020)			(0.035)			(1.554)
Any shared staff			-0.021			0.008			1.852
			(0.020)			(0.033)			(1.246)
Any district staff			-0.058*			-0.162***			1.769
			(0.030)			(0.054)			(2.315)
Biennial session frequency			-0.009			0.036			2.212
			(0.021)			(0.054)			(1.794)
Other Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	82,992	82,992	82,992	82,992	82,992	82,992	80,707	80,707	80,707
R-squared	0.155	0.161	0.162	0.158	0.164	0.166	0.157	0.162	0.162
Mean dep var	0.734	0.734	0.734	1.933	1.933	1.933	47.04	47.04	47.04

Lower House Elections

	Contested			Number of Candidates			Margin of Victory		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log salary	0.035*	0.039**	0.039**	0.062**	0.071***	0.073***	0.119	-1.014	-0.952
	(0.018)	(0.017)	(0.017)	(0.027)	(0.026)	(0.024)	(1.925)	(1.603)	(1.551)
Session length in election year (in hundreds of days)			0.012			0.017			0.212
			(0.016)			(0.028)			(1.045)
Any personal staff			0.035			0.044			-1.040
			(0.022)			(0.035)			(1.715)
Any shared staff			-0.028			-0.005			2.037
			(0.023)			(0.036)			(1.322)
Any district staff			-0.060*			-0.168***			1.014
			(0.035)			(0.059)			(2.614)
Biennial session frequency			-0.011			0.034			2.057
			(0.025)			(0.059)			(2.181)
Other Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	63,095	63,095	63,095	63,095	63,095	63,095	61,232	61,232	61,232
R-squared	0.164	0.167	0.168	0.169	0.171	0.173	0.163	0.167	0.167
Mean dep var	0.719	0.719	0.719	1.908	1.908	1.908	48.30	48.30	48.30

Notes: This table anlayzes the effect of legislative salary on candidate selection using US state legislative elections from 1967-2003. An observation is an election. Robust standard errors clustered by state in parentheses. The contested election variable is a dummy for whether the election had more than one candidate. Log salary is the logarithm of the real salary in 1982 dollars. Additional controls are the log of state population, adummy for upperhour elections in panel one only, a dummy for elections for term limited seats and a dummy for elections for four-year term lengths term limits.