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Abstract

What are the fiscal consequences of legislative term limits? To answer this question, we first study how the average seniority of a legislature affects government spending. We develop a legislative bargaining model that predicts a U-shaped relationship between average seniority and spending: the amount of government spending decreases as the average seniority of the legislature increases from low to moderate, while it increases as the average seniority increases from moderate to high. Our model also predicts that the equilibrium level of seniority is moderate. Building on these predictions, we hypothesize that the adoption of term limits resulting in a small reduction in average seniority in the legislature has little impact on government expenditures because average seniority remains moderate. In contrast, the adoption of term limits that dramatically reduces average seniority of the legislature will increase the amount of government spending because average seniority changes from moderate to low. We test the predicted relationship between seniority, term limits, and government spending using panel data for US state legislatures between 1980 and 2004.

Keywords: Legislative Term Limits; Seniority; Legislative Bargaining; Fiscal Spending

JEL classification: D72, H11, H72

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1 Introduction

Numerous studies in political science and economics have shown that institutional designs exert a strong influence on policy choices in democracies by constraining the actions of elected officials. For instance, electoral systems produce incentives for elected officials to represent certain constituencies and to allocate particular types of resources (Persson and Tabellini, 2003). Other types of institutional features (e.g., the forms of government and the degree of decentralization) have also been shown to produce significantly different incentives for elected officials, which then result in different policy outcomes (Lijphart, 1999).

Recent research suggests that term limits on elected officials are another important institutional design that can affect policy choices. Besley and Case (1995) find that US governors facing a binding term limit tend to increase taxes and expenditures (see also Alt, Bueno de Mesquita, and Rose (2011)). According to the authors, the adoption of executive term limits deemphasizes the importance of political reputation for chief executives who are ineligible for reelection, and they have fewer incentives to serve the interests of voters in their last term. Johnson and Crain (2004) find a similar result using cross-national data.[1]

Less is known about the impact of *legislative* term limits on policy choices. Scholars and political observers have debated the fiscal consequences of legislative term limits in the US, where, as of January 2012, term limits are imposed on the legislatures of 15 states. Some supporters of term limits claim that the introduction of term limits should end pork-barrel politics and ultimately decrease the total amount of government expenditures because long-serving incumbents who are fiscally liberal or more experienced in pork-barrel politics would be replaced with freshmen who are considered to be fiscally conservative or

[1]However, see Dalle and Ricciuti (2011) for more recent work that finds no impact of executive term limits on fiscal policies.

more "clean"(e.g., Payne, 1992).[2] Recent empirical analysis with data from US states for the period 1977–2001, however, reports a result contrary to the above expectation: the amount of total government spending *increased* after legislative term limits were introduced (Erler, 2007). In short, the literature on legislative term limits leaves us with an important puzzle: How and why does the adoption of legislative term limits affect government spending? Does it matter for policy outcomes as an institutional design?

To address the above questions, we first seek to fill an important gap in the literature on the role of seniority in legislative organizations. The adoption of term limits is expected to affect government spending because it changes the overall distribution of seniority of individual legislators within a legislature. Term limits lead to junior members replacing senior members, resulting in a reduction in the average seniority of the legislature. What is not clear from the existing evidence is how the shift in average seniority affects legislative activities. A variety of studies suggest that legislators' political views and skills change as they gain seniority (Dick and Lott, 1993; Lazarus, 2010; Levitt and Poterba, 1999; McKelvey and Riezman, 1992; Payne, 1992), implying that the change in average seniority of the legislature generates a shift in the aggregate preference toward fiscal policy or experiences in pork-barrel politics. We argue that the distribution of seniors and juniors in the legislature is a crucial determinant of legislative activities because it shapes the way legislators bargain over distributive benefits, which would then affect the amount of spending. This paper shows that a legislature whose members are all long-serving seniors generates different spending patterns from one composed of many junior members, not only because their

[2] Payne (1992) argues that senior legislators who remain in office for a long time are exposed to the culture of excessive spending and as a consequence, become more liberal fiscally. Garand, Myers, and Renegar Renee (2011) report that senior members of Congress are more likely to support greater spending than their junior colleagues. Furthermore, senior members of Congress are known to deliver more distributive benefits to their own constituents (Lee, 2003; Lazarus, 2010).

aggregate preferences and experiences differ, but also because the bargaining processes among them are different.

We elaborate on the above discussion by developing a simple model of legislative bargaining over distributive benefits among legislators with different levels of seniority.[3] We consider a legislature that is composed of senior and junior legislators. We assume that senior legislators are (1) more efficient than junior legislators in the way they bring distributive benefits to their districts, and (2) more likely to be a party leader or committee chair and thus capable of imposing discipline on junior legislators. The first assumption implies that senior legislators are capable of delivering more benefits to their districts compared with junior legislators, and the second assumption means that senior legislators possess the power to cut the amount of distributions allocated to junior legislators' districts.

Building on these assumptions, our model predicts a U-shaped relationship between the average level of seniority in the legislature and the amount of government spending. The amount of government spending decreases as the average seniority in the legislature increases from low to moderate because when the legislature has more seniors, they can discipline junior members in order to reduce the amount of distributions allocated to junior members' districts. When the legislature is occupied mostly by junior members (i.e. a low level of seniority), there is no such disciplinary behavior in the bargaining process. In contrast, the amount of government spending increases as the average seniority increases from moderate to high because senior members do not discipline each other, allowing themselves to spend as much as possible. We test these predictions drawn from a model using

[3]Our model differs from similar models such as Dick and Lott (1993), Glaeser (1997), Herron and Shotts (2006), and McKelvey and Riezman (1992). McKelvey and Riezman (1992) analyze the role of seniority in legislative bargaining, but their model generates no prediction on fiscal consequences. Dick and Lott (1993) and Glaser (1997) analyze the consequences of term limits for social welfare in the presence of the seniority system in the legislature, but their models offer no clear implication for the level of government spending.

panel data for 46 US state legislatures between 1980 and 2004. The level of seniority is measured by the average length of legislators' terms in the chamber. Our estimation results confirm that the relationship between seniority and spending is indeed quadratic and U-shaped.

We then extend our theory and empirical evidence to reexamine the effects of legislative term limits on government spending. The U-shaped relationship between the average level of seniority and government spending shown in the first part of the paper offers an important theoretical implication for the fiscal consequence of term limits. Our analysis of the electoral choice of voters indicates that the equilibrium level of seniority in the legislature without term limits is moderate, which minimizes the amount of government spending. Accordingly, the adoption of term limits that dramatically reduces the average seniority will increase the amount of government spending because the average seniority changes from moderate to low. In contrast, the adoption of term limits resulting in a small reduction in the average seniority has little impact on government expenditures because the average seniority remains to be moderate. Using the same data set for US states, we estimate the impact of term limits on government spending. Our analysis shows that government spending increases only when the adoption of term limits dramatically reduces the level of seniority in the legislature.

This paper ultimately contributes to the literature on legislative studies in two major ways. First, this paper constitutes the first study to demonstrate that average seniority in a legislature plays an important role in policy outcomes. Prior research examined how the seniority of individual legislators affects policy choices (Lazarus, 2010; Levitt and Poterba, 1999), or why the seniority system evolved in the legislature (Holcombe, 1989; McKelvey and Riezman, 1992), yet only a limited number of studies have explored how the overall level of seniority in the legislature affects policy choices.[4] Using a new measure of overall seniority in US state legislatures, our analysis finds that the overall level of seniority in the legislature is indeed an important determinant of fiscal policies.

Second, we show theoretically and empirically that term limits are another institutional determinant of economic policies. In contrast to previous studies that show that government spending always expands as a result of term limits (Erler, 2007; Besley and Case, 1995; Alt, Bueno de Mesquita, and Rose, 2011), our research shows that the relationship between term limits and the amount of government spending depends crucially on the level of seniority in the legislature, and thus is more complicated than supposed previously. Substantively, our findings offer an important implication for states and nations that are considering adopting term limits.

The paper proceeds as follows. The next section analyzes formally and empirically the relationship between average seniority of a legislature and government spending. The third section first draws an implication from the second section regarding the fiscal consequences of term limits and then verifies it empirically. The final section offers some concluding remarks.

2 Seniority and Government Spending

This section develops a model of legislative bargaining among legislators with different levels of seniority and predicts the amount of government spending. It then tests the predic-

[4]A recent study by Sobel and Ryan (2011) examines the effect of overall seniority on legislative production. Unlike our paper, Sobel and Ryans' study offers only a brief theoretical explanation for why average seniority of the legislature matters. Furthermore, as their empirical analysis uses data only from one legislature (the U.S. Congress), their study does not adequately control for the underlying characteristics of the legislature. This paper uses data from state legislatures, and exploits variations over time, while taking into account the attributes of state legislatures.

tion using data from US states.

2.1 The Model

Our model considers a single legislative session where (1) voters choose a single representative of their district before the session begins, (2) elected legislators negotiate the allocation of distributive projects, and (3) distributive projects approved by the legislature are implemented. In each district, there are $n > 0$ voters. Voters choose either an incumbent or a new challenger. We call reelected incumbents *senior*, who are denoted as S, and new legislators *junior*, denoted as J.

Suppose that the legislature consists of three legislators. Each legislator is elected from district i with $i \in \{1,2,3\}$. Denote as s the number of senior legislators in the legislature. Elected legislators negotiate over the allocation of distributive projects to their districts. Distributive projects in our model are continuous units with several possible projects in the district. The amount of distribution for each distributive project allocated to district i is defined as d_i, which equals the benefit district i receives from this project. Only district i is eligible to receive the benefit from the project. If m distributive projects are allocated, the total amount of distributions and benefits that district i receives is equal to md_i. If only the proportion $1-p$ of m distributive projects are implemented, the total amount is equal to $(1-p)md_i$. Without loss of generality, we suppose $m = 1$.[5] That is, we focus on the proportion of projects implemented $(1-p)$ and ignore how many projects $((1-p)m)$ are implemented.

The cost of projects, $c(d_i)$, is spread evenly across all districts, and each district pays $c(d_i)/3$. We assume $c(d_i) = \lambda d_i^2 + k$, where each district bears a fixed cost, $k > 0$, to imple-

[5]When $m > 1$, we simply multiply the equations for the amount of spending and payoffs by m. This assumption does not affect our propositions or main results.

ment distributive projects. If the projects are not implemented, the fixed cost is zero. The variable cost function is quadratic, which means that there are additional costs to incur d_i. The value of λ represents the amount of variable costs incurred in implementing the distributive project. We assume that $\lambda = 1$ if district i elects a senior legislator, while $\lambda > 1$ if district i elects a junior legislator. This assumption means that senior legislators can supply distributive benefits with lower costs compared with junior legislators (Dick and Lott, 1993; Levitt and Poterba, 1999). This assumption seems plausible because senior legislators have more staff and larger research budgets and are likely to know more about their districts, which allows them to be more efficient in the way they spend distributive benefits on their districts.[6] Both voters and legislators prefer a higher payoff for their district.

The allocation of projects is chosen via a simple ultimatum legislative-bargaining model developed by Baron and Ferejohn (1989). One of three legislators is chosen as an agenda setter. The agenda setter proposes which district receives distributive benefits. If the majority of legislators (i.e., two legislators) approve the proposal, distributive projects are implemented. We assume that legislators in the majority maximize the total payoffs they receive. That is, they consider the amount of costs incurred by their own district and the other legislators' districts in the majority. This is because the majority can be interpreted as a government party, a coalition government, or a faction in the legislature that should maximize its total payoff, rather than as an individual by adjusting the interests of the members. That is,

[6] Even if we do not assume that senior legislators can implement projects with lower costs than junior ones (i.e., even if we assume that $\lambda = 1$ for both types), the main results of this paper do not change (in fact, they become even more robust). We employ this assumption because supporters of legislative term limits emphasize this point as the problem associated with having more senior legislators, as mentioned in the introduction. Later in the paper, we show that legislative term limits may increase the amount of spending even if we assume that $\lambda = 1$ for both types.

$$d_i = \arg\max_d d - \frac{2}{3}(\lambda d^2 + k). \quad (1)$$

If the legislature does not approve the proposal, no distributive project is implemented. Hence, $d_i = 0$ for all i.

The probability of a legislator being an agenda setter is determined by seniority. Senior legislators tend to be leaders of the party, legislature, or committees because their lengthy career allows them to accumulate legislative skills and receive better committee assignments, as discussed by McKelvey and Riezman (1992).[7] Accordingly, to simplify our discussion, we assume that no junior legislator can ever become an agenda setter in the presence of at least one senior legislator in the legislature.[8] Each senior legislator has the same probability of being an agenda setter ($1/s$). If all legislators are junior, one of them will be an agenda setter with probability 1/3.

Furthermore, we assume that a senior agenda setter is capable of disciplining a junior legislator who belongs to the majority. This assumption is equivalent to party discipline. If there are both senior and junior members in the legislature, the senior is more likely to be a party leader or a committee chair (i.e., an agenda setter). Then, the legislature has a hierarchical structure, and the budget process will be centralized. In this case, the party

[7]Squire and Moncrief (2010) note that seniority plays an important role in the selection of leaders and committee chairs in US state legislatures.

[8]Even if we relax this assumption, the main result does not change significantly as long as senior legislators have a sufficiently higher probability of being an agenda setter than junior legislators. However, if the probability of becoming an agenda setter is not significantly different between senior and junior legislators, the equilibrium discussed in Subsection 3.1 may change, and all districts elect junior legislators in the equilibrium. This is because the probability that senior legislators are in the majority becomes very low because the agenda setter prefers not to include senior legislators, who cannot be disciplined and who demand larger distributions than junior legislators. Then, voters prefer not to reelect senior legislators. However, it is unrealistic to assume that senior legislators tend not to be included in the majority, and thus it is more reasonable to assume that a senior legislator is much more likely to be the leader of the legislature, party, or faction (i.e., the agenda setter). In addition, the comparative statics on the total amount of distributions D_i, discussed in Subsection 2.2.4, do not change significantly even if senior and junior members have similar probabilities of being an agenda setter.

or the committee can have the gate-keeping authority to adjust the amount of spending.[9] Put differently, a senior agenda setter can choose the proportion of distributive projects, $1-p$, that will be implemented in a district with a junior legislator. The junior legislator is allowed to deliver only $1-p$ of distributive projects to the district. Depending on the size of p, the junior member decides whether or not to approve the proposal made by the senior agenda setter. However, if all legislators are the same type, there is no hierarchical relationship between legislators and the budget process is likely to be decentralized. Accordingly, the power of party leaders and committee chairs decreases, and the party or committee discipline becomes less coercive.[10] Thus, we assume that a senior agenda setter is incapable of disciplining other senior legislators, and a junior agenda setter is incapable of disciplining either junior or senior legislators.

Finally, we set the following assumptions.

Assumption 1 $\frac{27-9\lambda}{32\lambda} > k > \frac{3}{16}$ *and* $\lambda < \frac{9}{5}$.

If $\frac{27-9\lambda}{32\lambda} > k$, a district whose legislator is in the majority receives a nonnegative payoff regardless of the number of senior legislators in the legislature and the types of legislators in this district. If not, no one has an incentive to implement any distributive projects in their own district because all distributive projects bring negative benefits. Furthermore, if $k > \frac{3}{16}$, distributive projects are socially inefficient because the aggregate payoff of all districts becomes negative. We focus on such inefficient projects because distributive policies are analyzed typically as a tragedy of the commons or a prisoner's dilemma and also because

[9] Cox and McCubbins (1993) show that party leaders of the US House of Representatives exercise disciplinary power over their party members, and Clucas (2001) and Squire and Moncrief (2010) argue that legislative leaders in the state legislatures also possess formal and informal power to discipline other members.

[10] This point has actually been observed in the legislative process after the introduction of term limits. Term-limited legislatures decentralize the budget process by weakening the power of legislative leaders (Carey et al., 2006; Farmer et al., 2007; Little and Farmer, 2007). That is, term limits lead to a legislature that is composed of many junior legislators who cannot discipline each other.

those projects tend to be locally efficient but socially inefficient (e.g., Weingast, Shepsle, and Johnson, 1981). To have $\frac{27-9\lambda}{32\lambda} > \frac{3}{16}$, λ should be lower than 9/5.

2.2 Relationship between Seniority and Government Spending

This subsection computes the total amount of government spending on distributive projects as the overall level of seniority changes from low to high. In our setting, there are four possible levels of seniority, $s = 0, 1, 2, 3$. We refer to the case with $s = 0$ as *low seniority*, with $s = 1$ or 2 as *moderate seniority*, and with $s = 3$ as *high seniority*.

2.2.1 Low Seniority ($s = 0$)

All legislators are junior when $s = 0$. One of the junior legislators is chosen as an agenda setter. Because this junior agenda setter cannot discipline other legislators, the agenda setter proposes implementation of all possible distributive projects (i.e., $p = 0$) for two districts (including the agenda setter's district). From (1), the amount of distributions and the cost of all possible distributive projects in one district are equal to $d_i = \frac{3}{4\lambda}$ and $c(d_i) = \frac{9}{16\lambda} + k$, respectively. Districts where all of the distributive projects are implemented receive the benefits and pay the costs. The payoff is $\frac{3}{8\lambda} - \frac{2}{3}k$. This payoff is positive when $\frac{9}{16\lambda} > k$, which is true because $\frac{9}{16\lambda} > \frac{27-9\lambda}{32\lambda} > k$ from Assumption 1. Because the payoff is positive, a legislator in the majority has an incentive to approve the proposal. On the other hand, the remaining districts where no distributive project is allocated receive no benefit but pay the costs of the other two districts, which are $-\frac{3}{8\lambda} - \frac{2}{3}k < 0$. The legislator whose district receives distributive benefits approves the proposal, while the other junior legislator does not approve it. Accordingly, this proposal is approved in the legislature. The aggregate payoff of all districts is $2\left[\frac{3}{16\lambda} - k\right]$. From Assumption 1, $k > \frac{3}{16} > \frac{3}{16\lambda}$, which indicates that the aggregate payoff is negative.

Denote as V_s^t the expected payoff before an agenda setter is chosen. In V_s^t, t represents the type of legislator (i.e., S or J) elected in district i, and s is the number of senior legislators in the legislature. When $s = 0$ and $t = J$, the expected payoff is

$$V_0^J = \frac{1}{8\lambda} - \frac{2}{3}k.$$

This expected payoff is negative because $k > \frac{3}{16} > \frac{3}{16\lambda}$ from Assumption 1. However, after an agenda setter is chosen, the legislators in the majority prefer to approve the proposal because the ex post payoff from distributive projects is positive.

Finally, denote as $D_s = \sum_{i=1}^{3} d_i$ the total amount of spending for distributive projects when there are s legislators in the legislature. When $s = 0$, it is

$$D_0 = \frac{3}{2\lambda}. \tag{2}$$

2.2.2 High Seniority ($s = 3$)

If all legislators are senior ($s = 3$), one of them is chosen as an agenda setter. The agenda setter cannot discipline other senior legislators. The agenda setter proposes implementation of all possible distributive projects for two districts, one of which is the agenda setter's district. Thus, an almost identical situation emerges as in the case of low seniority in the previous subsection, except that $\lambda = 1$. The amount of distribution is $d_i = \frac{3}{4}$, and the cost of distributive projects is $c(d_i) = \frac{9}{16} + k$. Both of them are larger than those in the case of low seniority because $\lambda > 1$. This means that senior legislators are better equipped at rent-seeking from other districts and that they spend more money on their districts than junior legislators do. The payoff for the district with distributive projects is $\frac{3}{8} - \frac{2}{3}k$, and the aggregate payoff from distributive projects is $2\left[\frac{3}{16}-k\right]$. From Assumption 1, $\frac{9}{16} > \frac{27-9\lambda}{32\lambda} > k > \frac{3}{16}$, so the payoff of the district with distributive projects is positive, and this project is socially inefficient. Accordingly, this proposal is approved by the legislature. The expected payoff is

$$V_3^S = \frac{1}{8} - \frac{2}{3}k.$$

The total amount of spending for distributive projects is

$$D_3 = \frac{3}{2}.$$

2.2.3 Moderate Seniority ($s = 1$ or 2)

Suppose that at least one senior and one junior legislator are elected. Recall that junior legislators are never chosen as an agenda setter, and that senior legislators become an agenda setter with probability $1/s$. To maximize the payoff, a senior agenda setter chooses a junior legislator rather than a senior legislator to build the majority. This is because senior legislators spend more on their own districts than a junior legislator, and also because the senior agenda setter can discipline junior legislators. Thus, the costs paid by a senior agenda setter are lower when the majority is formed with a junior member than with a senior member. If $s = 1$, a senior legislator becomes an agenda setter with certainty, and one of the remaining junior legislators is included in the majority with probability 1/2. If $s = 2$, a senior legislator becomes an agenda setter with probability 1/2, and the sole junior legislator is included in the majority with certainty.

As all possible distributive projects are implemented in the district that elected a senior agenda setter, all districts must pay at least $-\frac{3}{16} - \frac{k}{3}$ in total if the proposal is approved. At the same time, the district with a junior legislator who is in the majority and disciplined receives the proportion $1-p$ of distributive projects. Thus, this district obtains $(1-p)\left[\frac{3}{4\lambda}-\frac{3}{16\lambda}-\frac{k}{3}\right]=(1-p)\left[\frac{9}{16\lambda}-\frac{k}{3}\right]$. The senior agenda setter ensures that the junior legislator in the majority approves the proposal by providing at least a zero payoff. The junior legislator in the majority rejects the proposal if the payoff is lower than zero. To maximize the payoff, the senior agenda setter sets p such that the payoff of the junior legislator in the majority becomes exactly zero. That is, p should satisfy $(1-p)\left[\frac{9}{16\lambda}-\frac{k}{3}\right]-\frac{3}{16}-\frac{1}{3}k=0$. After some calculations, we can show that it is

$$p^* = \frac{27-9\lambda-32\lambda k}{27-16\lambda k}. \tag{3}$$

As $\frac{27-9\lambda}{32\lambda} > k$ from Assumption 1, p^* is positive. The denominator is higher than the numerator; therefore, $0 < p^* < 1$. p^* decreases as the variable costs (i.e., λ) and fixed costs (i.e., k) of distributive projects increase. As a result, the senior agenda setter's payoff is $\frac{9}{16}-(1-p^*)\frac{3}{16\lambda}-\frac{k}{3}(2-p^*)$. This is positive because $\lambda > 0$ and $p^* < 1$. The payoff of the legislator who does not belong to the majority is $-(1-p^*)\frac{3}{16\lambda}-\frac{3}{16}-\frac{k}{3}(2-p^*)$, regardless of the type of legislator.

Taken together, when $s=1$, before an agenda setter is chosen, the expected payoffs of senior and junior legislators are

$$V_1^S = \frac{9}{16}-(1-p^*)\frac{3}{16\lambda}-\frac{k}{3}(2-p^*).$$

$$V_1^J = -\frac{1}{2}\left[\frac{3}{16}+(1-p^*)\frac{3}{16\lambda}+\frac{k}{3}(2-p^*)\right].$$

When $s = 2$, the expected payoffs are

$$V_2^S = \frac{3}{16} - (1-p^*)\frac{3}{16\lambda} - \frac{k}{3}(2-p^*).$$

$$V_2^J = 0.$$

The total amount of spending for distributive projects is

$$D_1 = D_2 = \frac{3}{4} + (1-p^*)\frac{3}{4\lambda}. \tag{4}$$

2.2.4 Comparison of the Total Amount of Spending

We now compare the total amount of spending for distributive projects across legislatures with different levels of seniority. First, $D_3 = \frac{3}{2} > D_0 = \frac{3}{2\lambda}$ because $\lambda > 1$. Second, $D_3 = \frac{3}{2} > D_1 = D_2 = \frac{3}{4} + (1-p^*)\frac{3}{4\lambda}$ because $\lambda > 1$ and $0 < p^* < 1$.

Some calculations show that $D_0 = \frac{3}{2\lambda} > D_1 = D_2 = \frac{3}{4} + (1-p^*)\frac{3}{4\lambda}$ if $p^* > \lambda - 1$. From (3), this condition means $\frac{27 - 9\lambda - 32\lambda k}{27 - 16\lambda k} > \lambda - 1$. This condition can be rewritten as

$$\frac{27 - 18\lambda}{\lambda(24 - 8\lambda)} > k. \tag{5}$$

The left-hand side decreases as λ increases when Assumption 1 holds ($1 < \lambda < 9/5$). In other words, the amount of spending under moderate seniority ($s = 1$ or 2) is lower than under low seniority ($s = 0$) if the variable costs (i.e., λ) and fixed costs (i.e., k) of distributive projects in a district electing a junior legislator are sufficiently low.

The value of k plays some role in the total amount of spending. It has no influence on the amount of spending under low seniority. On the other hand, as k increases, the cost of distributive projects increases. To motivate a junior legislator to approve the proposal made by a senior agenda setter, the senior agenda setter has to allow implementation of a higher proportion of distributive projects in the junior legislator's district. Accordingly, p^* decreases, and the amount of spending under the moderate level of seniority increases as k increases.

From (2), if λ increases, the amount of spending decreases under low seniority. On the other hand, $D_1 = D_2 = \frac{3}{4} + (1 - p^*)\frac{3}{4\lambda}$ increases as λ increases. Even though a higher λ decreases the distribution amount (i.e., d_i) in a district that elected a junior legislator who is in the majority, it also decreases the benefits that this district receives (i.e., $\frac{9}{16\lambda} - \frac{k}{3}$). Thus, to induce a junior legislator to approve the proposal of a senior agenda setter, the senior agenda setter needs to allow implementation of a higher proportion of distributive projects in the junior legislator's district. That is, p^* decreases, so the amount of spending under moderate seniority increases as λ increases.

Proposition 1 *Consider Assumption 1. The amount of spending under low seniority is higher than the amount of spending under moderate seniority when the variable costs (λ) and fixed costs (k) of a distributive project in a district with a junior legislator are sufficiently low such that (5) is satisfied.*

When (5) is satisfied, $D_3 > D_0 > D_1 = D_2$.[11] Thus, the relationship between the amount of government spending and the level of seniority is U-shaped, as shown by Figure 1, where k is fixed at 0.2. The amount of spending under high seniority is always $D_3 = 1.5$. If the legislature is composed of one or two senior legislators and λ is sufficiently low (= 1.1), $D_1 = D_2 \fallingdotseq 1.14 < D_0 = 1.36$, and the relationship becomes U-shaped. If the legislature is

[11] If we do not assume that senior legislators have lower costs than junior ones (i.e., if we assume $\lambda = 1$ for both types), (5) is always satisfied from Assumption 1.

composed of one or two senior legislators and λ is sufficiently high (= 1.5), $D_1 = D_2 = 1.16 > D_0 = 1$, and the amount of spending increases as the level of seniority increases.

[Figure 1 Here]

We next show empirically that the relationship between the level of seniority within a legislature and government spending is curvilinear and U-shaped. This implies that actual values of λ and/or k are likely to be sufficiently small.

2.3 Empirical Analysis

To test the predicted relationship between seniority and spending, we develop a panel data set of 46 US states between 1980 and 2004. States and years are chosen on the basis of data availability, as explained below. The total number of observations included in our analysis is 1150. We omit Alaska, Hawaii, Nebraska, and Vermont because seniority data for those legislatures are unavailable.

We examine the predicted relationship using the following model:

$$\begin{aligned} [Spending]_{it} = \quad & \beta_1 [Seniority]_{it-1} + \beta_2 [Seniority]^2_{it-1} + \beta_3 [V.Seniority]_{it-1} \\ & + \lambda \mathbf{w}_{it-1} + \delta \mathbf{x}_{it} + \rho_i + \phi_t + \epsilon_{it}, \end{aligned} \tag{6}$$

where $[Spending]_{it}$ denotes the size of total government expenditures per capita in state i in year t. $[Seniority]_{it-1}$ is a measure of seniority within a legislature in state i in year $t-1$, while $[Seniority]^2_{it-1}$ is its squared term. $[V.Seniority]_{it-1}$ is a variance of seniority within state i's legislature in year t. $\mathbf{w}_{it-1}$ includes all time-varying political variables that may have an impact on the level of seniority in a legislature and $[Spending]_{it}$. We take the lag of these variables to address the gap between the budget year and the election year.[12] $\mathbf{x}_{it}$ includes all time-varying socioeconomic variables. ρ_i denotes a state fixed effect that captures all time-invariant characteristics of state i. ϕ_t denotes a year fixed effect that captures any time-specific shock at the national level. Finally, ϵ_{it} is a state-year specific error term.

All time-invariant characteristics of state i are captured by the state fixed effect, ρ_i. Time-invariant characteristics include stable institutional designs and potentially unobservable cultural norms that could be related to the level of seniority and government expenditures. As we include the fixed effect for each state in our model, our estimation exploits variations within each state. Thus, the comparison is not made across states but, rather, within each state.

Any time-specific shock is captured by the year fixed effect, ϕ_t. Year fixed effects capture the effects of election years, national economic conditions, and any other major events that occurred in a particular year that might be associated with the level of seniority and government expenditures. The omission of the year fixed effect would cause a bias in the coefficient of primary interest.

The outcome variable, $[Spending]_{it}$, is measured by total government expenditures per capita in dollars. We assume that the size of spending for distributive projects is correlated strongly with the amount of total government spending because the allocation of distributive benefits is determined independently from other necessary expenditures. The government expenditures per capita are reported in constant 1982 dollars. The data come from State Government Finances compiled by the US Census Bureau.[13]

The main explanatory variable, $[Seniority]_{it-1}$, equals the average length of terms of state

[12]For example, legislators who won the 1998 election are expected to influence the budget year beginning July of 1999.

[13]The data are obtained from the web site at `http://www.census.gov/govs/state/`.

senators and state house members. We calculate the values for the $[Seniority]_{it-1}$ variable separately for each chamber. To calculate this variable, for each legislative session, we first count the number of each legislator's terms (only for the office that one is currently holding) using the candidate-level database of State Legislative Election Returns, 1967-2003.[14] We treat the number of election victories in general elections as the same as the number of candidates' terms. We drop the data before 1977 because we cannot count precisely the number of times that legislators have won prior to 1967. We assume that legislators who appear in the dataset after 1977 did not run for the state house or state senate before 1967. We then compute the average number of terms served for all legislators in each chamber. The mean level of seniority in state senates is 2.7, while the mean level of seniority within state houses is 3.5. The correlation between the levels of seniority between the two chambers is 0.60.[15] The distributions of the level of seniority are shown in Figure 2.[16] In the following analysis, we run two different regression models for the two chambers, in order to estimate the effect of the seniority measures on government spending.

[Figure 2 Here]

Figure 3 reports the temporal variation in the average level of seniority in the state sen-

[14]The data are available from the ICPSR data archive.

[15]We assume that the prediction of our model applies to both chambers of the state legislatures in the same way. The upper and lower houses differ in their baseline characteristics such as membership size and culture, yet their budget processes are similar (Squire and Moncrief, 2010). In order to account for their difference, however, we estimate the two chambers separately in the subsequent section.

[16]When we draw the histograms, we include all states regardless of the length of their legislative terms. In most states, the members of state houses have a 2-year term and senators have a 4-year term. However, in five states, both senators and representatives have a 4-year term, while twelve states have a 2-year term for both chambers. States with a 2-year term for the senate have a higher mean of seniority than the top panel in Figure 2, while those states with a 4-year term for the lower house exhibit a lower mean of seniority than the bottom panel. The purpose of these histograms is to show the overall distribution of seniority, rather than showing the the exact location of the mean. While these difference may slightly affect the shape of the histograms, different lengths of legislative terms should have no impact on our estimation because we exploit within-state variations and also because the length of legislative remained constant during the period of our study. As a robustness check, we reestimated the model in Table 2 with standardized seniority measures, using the means and standard deviations of seniority measures calculated separately for 2-year and 4-year terms. The results are similar to those reported in Table 2. The results are available upon request.

ates (shown by dashed lines) and the state houses (shown by solid lines) of the 46 states from 1980 to 2004. Note that vertical lines in the figure denote the first year at which term limits came into effect, meaning that incumbents who had served a certain number of terms were no longer eligible for reelection. Figure 3 shows that the average levels of seniority vary considerably over time and across states.

[Figure 3 Here]

In addition to the average level of seniority and its squared term, we also include the variance of seniority of the legislature in equation (1) as a control. We take into account the possibility that some legislatures show higher variability in their members' seniority than others. For each state, we compute the variance of seniority using the number of terms served for all legislators in each chamber.

The vectors $\mathbf{w}_{it-1}$ and $\mathbf{x}_{it}$ in equation (6) contain control variables for other time-varying political and socioeconomic characteristics of states. State political characteristics are measured by the percentage of Democratic legislators in the chamber, indicator variables for a Democratic governor, and for divided government that takes a value of one unless the same party controls the governor's office and both chambers. The data come from Klarner (2011). In addition, we take into account the presence of the executive term limit. The indicator variable equals one if the term limit on the governor is effective and zero otherwise. The data are obtained from List and Sturm (2006). Socioeconomic characteristics are captured by the unemployment rate, personal income per capita, the gross state product per capita, the population size, and the percentage of the population under 15 years old and over 65 years old. All monetary variables are reported in constant 1982 dollars. We take the natural log of personal income per capita, GSP per capita, and population size. All of the socioeconomic data come from the Statistical Abstract of the United States. Summary statistics are presented in Table 1.

[Table 1 Here]

Table 2 reports the estimation results. Table entities are fixed effects regression estimates with standard errors are in parentheses. The standard errors are estimated using Driscoll and Kraay's (1998) covariance matrix estimator to take into account the potential heterogeneity and autocorrelation within each state and contemporaneous correlations across states. Column (1) shows the result when the seniority and legislative variables for the state senate are included in the model, while column (2) shows the result when the seniority and legislative variables for the state house are included.

[Table 2 Here]

The estimated results in columns (1) and (2) are consistent with the prediction of the model. The coefficients associated with the linear term (i.e., state senate seniority and house seniority) are estimated to be negative, while the coefficients associated with the quadratic term (i.e., state senate seniority squared and house seniority squared) are estimated to be positive. All of these coefficients are statistically significant at the 0.05 level.[17]

Using the estimated results in columns (1) and (2), we plot the relationship between the level of seniority in each chamber and government expenditures per capita. Figure 4 shows the predicted level of spending by the level of seniority with 95% confidence intervals indicated by the dashed lines. As predicted, Figure 4 demonstrates that the relationship is U-shaped. The amount of spending decreases, as the level of seniority approaches the middle of the scale where most of the observed levels of seniority locate as in Figure 2.

[Figure 4 Here]

[17] These results hold even when we take the natural log of the government expenditures per capita.

3 Seniority, Term Limits, and Government Spending

In this section, we examine the fiscal consequences of term limits by extending the theory and empirical evidence of the previous section. The adoption of term limits, by definition, reduces the level of seniority within a legislature. In fact, our data validate this assumption. In Figure 3, the vertical solid line denotes the year in which term limits for the state house became effective, while the vertical dashed line denotes the year in which term limits for the state senate became effective. The graphs show that the average level of seniority drops dramatically in most of those states adopting term limits. Accordingly, the adoption of term limits should change the amount of government spending. However, in contrast to past studies that assume that the effect of term limits on government spending is always positive or negative, the U-shaped relationship between seniority and spending indicates that term limits may increase or decrease the amount of spending, depending on the extent to which term limits affect the overall level of seniority.

In the subsequent subsections, we first analyze the electoral choices of voters and derive the level of seniority in the legislature endogenously. Then we predict the change in the level of spending after the adoption of term limits.

3.1 Election

In our model, voters in each district have two choices: reelect a senior legislator or elect a new (i.e., junior) legislator. Voters care only about the expected payoff, V_s^t.

If we assess each voter's strategy on the basis of Nash equilibria, there will exist too many equilibria because the electoral outcome does not change when there is no pivotal voter. Thus, we employ a coalition-proof Nash equilibrium introduced by Bernheim, Peleg, and

Whinston (1987).[18] Under this equilibrium, we can assume that voters in one district form a coalition and choose the winner as if they were a single player. We analyze only a pure-strategy equilibrium.

When there are two or more junior legislators ($s = 0$ or 1), if voters in a district electing a junior legislator deviate by choosing a senior legislator, they can enjoy the comparative advantages of having a senior legislator in legislative bargaining. Thus, they deviate by re-electing a senior legislator. When all legislators are senior ($s = 3$), they enjoy no comparative advantage, and there is a possibility that this senior legislator is not included in the majority. Thus, voters in a district electing a senior legislator have an incentive to deviate by choosing a junior legislator who is included in the majority with certainty. When there is one junior legislator ($s = 2$), senior legislators still enjoy some advantages, and a junior legislator is included in the majority with certainty. As a result, the unique (pure-strategy) coalition-proof Nash equilibrium is moderate seniority with $s = 2$.[19] The details of the proof are presented in the appendix.

Proposition 2 *Consider Assumption 1. In a coalition-proof Nash equilibrium, the level of seniority is moderate with* $s = 2$.

Importantly, Figure 4 shows that the level of spending is minimized when the overall level of seniority within the legislature approaches the mean of the scale, as predicted by Proposition 2. As discussed previously, the mean level of seniority within the state senates

[18]A coalition-proof equilibrium allows players to communicate prior to playing the game and to reach an agreement to coordinate their actions in a mutually beneficial way. A coalition-proof Nash equilibrium requires that the agreement is not subject to a improving deviation that is self-enforcing by any coalition of players. A deviation is self-enforcing if there is no further self-enforcing and improving deviation available to a proper subcoalition of players. In our model, all voters' payoffs in the same district are identical, so they can form a coalition to improve their payoffs. The following results do not change if we employ the strong Nash equilibrium introduced by Aumann (1959) which does not require self-enforcement.

[19]Note that MacKelvey and Riezman (1992) indicate that voters prefer electing legislators who are more senior under a seniority system, yet our model predicts that not all districts elect senior legislators.

is 2.7, while the mean level of seniority within the house is 3.5. The spending is minimized when the levels of seniority are in the middle of the scales.

3.2 Predicting the Effect of Term Limits

Our analysis of voters' electoral choices indicates that voters prefer moderate seniority ($s = 2$) in the absence of term limits. This means that the size of government spending is minimized in the absence of term limits since the relationship between the level of seniority and the total amount of government spending is shown to be U-shaped. Accordingly, the adoption of term limits will *increase* the size of spending as the level of seniority changes from moderate to low. In Figure 1, the level of spending before term limits are implemented is $D_2 \fallingdotseq 1.14$. It changes to $D_0 = 1.36$ after term limits are implemented.[20] Our model suggests that the adoption of term limits increases government spending because it removes a senior legislator who, as an agenda setter, disciplines a junior legislator and cuts some distributive projects allocated to the junior legislator's district.

An important implication can be drawn from the discussion above. Our model considers only four discrete levels of seniority in a single legislative session. In reality, however, the legislature is composed of legislators with various levels of seniority, as shown in the previous section. This means that the adoption of term limits generates continuous changes in the level of seniority. If the continuous level of seniority decreases significantly from the equilibrium level after term limits are adopted, it is likely to approach the low level. Accordingly, the amount of government spending will increase. In contrast, the adoption of term limits resulting in a small reduction in the continuous level of seniority has little impact on government expenditures because the level of seniority remains moderate.

[20]Our analysis indicates that λ and k are likely to be sufficiently small.

Drawing upon the above discussion, we hypothesize that *the adoption of term limits that leads to a larger reduction in the level of seniority increases the amount of government spending*. Our prediction is related to Erler's (2007, 489-90) informal argument regarding why the adoption of term limits increased state government spending. Erler argues that term-limited legislatures weaken the power of legislative leaders, which results in the decentralization of the budget process. This triggers a collective action problem and consequently leads to an increase in the amount of spending. The weakened power of legislative leaders after the adoption of term limits has indeed been reported in several empirical studies (Carey et al., 2006; Farmer et al., 2007; Little and Farmer, 2007).

3.3 Estimating the Effect of Term Limits

We test the above hypothesis using the same US state panel data. For our test, we develop two empirical approaches, both of which exploit the variation in the reduction of seniority by term limits across states. First, we categorize states that adopted term limits into two groups with a large and small reduction in the level of seniority. We expect that term limits that caused a major reduction in the level of seniority will increase total expenditures because the level of seniority is expected to approach the low level. In contrast, term limits that caused a minor reduction in the level of seniority will have little impact on total expenditures because the level of seniority is expected to remain moderate. The large and small reductions in the level of seniority are measured by comparing the level of seniority before and after the adoption of term limits. More specifically, for each state with term limits, we compute the average levels of seniority before and after the adoption of term limits. To compute the average seniority before the adoption of term limits, we include only the years after 1990 so that we compare the change in the level of seniority just before and after the adoption of term limits. For Maine where term limits were adopted in 1996, for example, we compute the average seniority between 1990 and 1995 and the average between 1996 and 2004 and then take a difference in the averages.

The changes in the average seniority before and after the adoption of term limits are reported in Table 3. All states show a reduction in the level of seniority after term limits are adopted, yet the degree of the reduction varies across states. Furthermore, the sizes of the reductions in the level of seniority between the state house and the state senate are similar. Using the size of changes in the level of seniority in the senate and the house, we separate the state into two groups. For the senate, if the average level of seniority decreased by more than one term after term limits were adopted, we define that states had a large change in the level of seniority by term limits. CA, AR, MI, and MO are included in this group. For the house, if the average level of seniority decreased by more than 1.5 terms after term limits were adopted, we define that the state had a large change in the level of seniority by term limits. CA, AR, MI, OH, and MO are included in this group.[21] We define the remaining states as "states with a small change by term limits" for both the senate and the house. In short, we split the group of states with term limits in half by using the size of reduction in the level of seniority. We predict that the former group will show an increase in the amount of government spending after term limits are adopted.

[Table 3 Here]

We create two indicator variables using the above two groups for the senate and the house separately. The first indicator variable equals one after term limits that generate a large reduction in the level of seniority became effective in state i and zero otherwise. The second indicator variable equals one after term limits that generate a small reduction in the

[21] The result reported below holds even if we use 1.0 as a threshold.

level of seniority became effective in state i and zero otherwise. The remaining states and years are coded zero. Data of term limits are obtained from the Web site of the National Conference of State Legislatures.[22] We add these indicator variables to equation (6) and reestimate the model.[23] As the model includes the state fixed effect term, we test whether there is a statistically meaningful difference in the amount of government spending before and after term limits came into effect.

The estimated results for the senates are reported in column (1) of Table 4. The coefficient associated with a large change in the level of seniority by term limits is positive and statistically significant. The coefficient indicates that the amount of government expenditures per capita increases by $170 after states adopt term limits that cause a large change in the level of seniority in the senate. In contrast, the coefficient associated with a small change in seniority by term limits is negative but not statistically significant.

[Table 4 Here]

Column (2) of Table 4 reports the result for the house. The coefficient associated with a large change in the level of seniority by term limits is positive and statistically significant. Compared with column (1), the coefficient is larger: government expenditure per capita increases by $257 after states adopt term limits that cause a large change in the level of seniority in the house. The coefficient associated with a small change in seniority by term limits is also positive and statistically significant. According to the estimate, government expenditure per capita increases by $35 after states adopt term limits that cause a small change in the level of seniority in the house. It is clear that term limits that cause a large change

[22] The Web site is found at `http://www.ncsl.org/Default.aspx?TabId=14844`.

[23] Note that we take a lag of the term limit variables to address the gap between the budget year and the election year.

in the level of seniority in the house have a stronger effect on the amount of government expenditures than those that cause a small change.

Second, we categorize states that adopted term limits using the difference in the maximum years of service. Of the 15 states with term limits for the house, three states (AR, CA, and MI) set the limit at six years, while the remaining 12 states set the limit at eight years. We expect that states that adopt stricter term limits (equal to six years) greatly decrease the level of seniority, resulting in an increase in the amount of government spending after the adoption. Note that term limits for the senate show no variation in the maximum years of service in our data. For estimation, we create two indicator variables for the six-year and eight-year term limits for the house. They equal one after term limits became effective in state i and zero otherwise. Other states and years are coded zero. We include these two indicator variables in equation (6) and reestimate the model. Our analysis focuses on the legislative variables of the house because there is no variation in the senate.

The estimated results using these indicator variables are reported in column (3) of Table 4. The coefficient associated with the six-year limit for the house is positive and statistically significant. The coefficient indicates that the amount of government expenditures per capita increases by $279 after states adopt six-year (i.e. stricter) term limits. The coefficient associated with eight-year term limits also indicates that the adoption of the eight-year limit increases government expenditures, but its effect is estimated to be smaller.

The above analysis presents evidence that more restrictive term limits that greatly reduce the level of seniority increase the level of spending, while less restrictive term limits that slightly reduce the level of seniority seem to have a positive but smaller effect on the level of spending.[24] Our model indicates that the level of seniority before the adoption of

[24] These results hold even when we take the natural log of the government expenditures per capita.

term limits is about moderate. More restrictive term limits are likely to change the level of seniority from moderate to low, which in turn leads to an increase in the total amount of spending. On the other hand, less restrictive term limits have a small impact on the level of seniority, which in turn leads to a small change in the total amount of spending.

4 Conclusion

This paper first examines the relationship between average seniority within a legislature and the amount of government spending. We develop a new model that shows a U-shaped relationship between the average level of seniority and government spending. The model indicates that the amount of government spending decreases as the average level of seniority increases from low to moderate, while it increases as the average level of seniority increases from moderate to high. We test this prediction drawn from the model using panel data for 46 US states between 1980 and 2004. As predicted, our analysis shows that the relationship between the level of seniority within the senate and the house and government expenditures is U-shaped. The same pattern is found for both the senate and the house.

We then extend the U-shaped relationship to reexamine how the adoption of term limits affects government spending. Prior research has revealed mixed views on the fiscal consequences of term limits. The U-shaped relationship between overall seniority and government spending predicts that the adoption of term limits resulting in a moderate level of seniority has little impact on government expenditures because the equilibrium level of seniority is predicted to be moderate. In contrast, the adoption of term limits that dramatically reduces the level of seniority will increase the amount of government spending because the level of seniority changes from moderate to low. Our empirical analysis reports that term limits that reduce the level of seniority to a greater extent increase the amount of government spending.

This paper offers evidence that is consistent with Erler's (2007) findings, yet our model now explains why the adoption of term limits increases government spending, in contrast to the popular wisdom that it decreases spending by removing senior legislators who tend to spend more for pork projects. We show formally and empirically that the relationship between term limits and the amount of government spending depends crucially on the level of seniority in the legislature.

In addition to the contribution to the literature on term limits, our study helps us understand the role of overall seniority in a legislature. To our knowledge, this paper is the first to show that the composition of legislators with different levels of seniority affects legislative bargaining and ultimately policy choices.

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Appendix: Proof of Proposition 2

First, suppose $s = 0$. Voters' expected payoff is V_0^J. If voters in one of the districts deviate by choosing a senior legislator, the number of senior legislators increases by one and the expected payoff changes to V_1^S. Thus, if $V_1^S > V_0^J$, voters have an incentive to deviate. From some calculations, if $p^* > \frac{15-27\lambda}{9+16\lambda k}$, $V_1^S > V_0^J$. As $15-27\lambda < 0$, it is always satisfied. Thus, $s = 0$ is not an equilibrium.

Second, suppose $s = 1$. Voters' expected payoff is V_1^J when they choose a junior legislator. If voters in one of two districts deviate by choosing a senior legislator, the number of senior legislators increases to two and the expected payoff changes to V_2^S. If $V_2^S > V_1^J$, voters have an incentive to deviate. From some calculations, $V_2^S > V_1^J$ if

$$\frac{27\lambda - 9(1-p^*)}{32\lambda - 16\lambda p^*} > k.$$

The left-hand side is higher than $\frac{27-9\lambda}{32\lambda}$, so the above condition is always satisfied from Assumption 1. Thus, $s = 1$ is not an equilibrium.

Third, suppose $s = 2$. As $V_2^S > V_1^J$, voters who elect a senior legislator have no incentive to deviate by choosing a junior legislator. Consider voters in a district electing a junior legislator. Their expected payoff is V_2^J. If these voters choose a senior legislator, their expected payoff becomes V_3^S which is negative as discussed. As $V_2^J = 0 > V_3^S$, voters will not deviate.

Finally, suppose $s = 3$. As $V_2^J > V_3^S$, voters in a district electing a senior legislator have an incentive to deviate by choosing a junior legislator. Thus, $s = 3$ is not an equilibrium. As a result, there exists a unique (pure-strategy) coalition-proof Nash equilibrium in which seniority is moderate with $s = 2$.[25]

[25] The voters from two or more districts do not form any coalition in this equilibrium because there does not exist any improving deviation.

Table 1: Summary Statistics

	Mean	SD	Min	Max
Total expenditures per capita	1678.450	436.818	821.008	3326.640
Seniority in the senate	2.707	0.853	1.118	6.918
Seniority variance in the senate	1.663	0.670	0.332	4.745
Seniority in the house	3.497	0.915	1.528	6.643
Seniority variance in the house	2.370	0.716	0.501	4.600
Gubernatorial term limits	0.666	0.472	0.000	1.000
Divided government	0.552	0.497	0.000	1.000
Percent Democratic legislators in the senate	58.006	18.335	8.571	100.000
Percent Democratic legislators in the house	57.310	17.824	12.857	98.095
Democratic governor	0.513	0.500	0.000	1.000
Percent unemployed	5.993	2.041	2.300	17.400
Personal income per capita (log)	9.554	0.184	9.058	10.087
GSP per capita (log)	2.802	0.197	2.310	3.510
Population size (log)	8.177	0.965	6.118	10.488
Percent under 15 years old	26.280	2.437	21.212	38.533
Percent over 65 years old	12.345	1.814	7.032	18.197
Number of Observations		1150		

Note: Data are based on 46 U.S. states between 1980 and 2004.

Table 2: Seniority and Government Spending

	(1) Senate	(2) House
Seniority	−119.115**	−68.620**
	(19.529)	(24.022)
Seniority squared	20.770**	7.280**
	(3.263)	(3.390)
Seniority variance	−2.535	21.394*
	(19.385)	(11.670)
Gubernatorial term limits	−18.699	−24.666
	(16.488)	(16.707)
Divided government	26.691**	24.812**
	(6.144)	(6.289)
Percent Democratic legislators in the senate	−0.985**	−0.490
	(0.395)	(0.490)
Democratic governor	6.052	3.173
	(9.299)	(9.997)
Percent unemployed	16.336**	18.085**
	(5.303)	(4.858)
Personal income per capita (log)	−18.971	58.847
	(171.703)	(175.274)
GSP per capita (log)	588.447**	569.932**
	(125.581)	(112.289)
Population size (log)	−448.063**	−449.215**
	(35.177)	(34.778)
Percent under 15 years old	−14.082**	−12.826**
	(5.695)	(5.796)
Percent over 15 years old	7.286	1.388
	(17.112)	(17.996)
R^2	0.922	0.920

Note: Table entities are fixed effects regression estimates and standard errors in parentheses. Standard errors are estimated by Driscoll and Kraay's (1998) covariance matrix estimator. Estimates are based on data from 46 states between 1980 and 2004. The dependent variable is the amount of total government expenditures per capita in dollars. Column (1) uses the level of seniority and the percent of Democratic legislators in the state senate, while column (2) uses them in the state house. State and year fixed effects are included in the models. The number of observations is 1150. $**$ $p < .05$, $*$ $p < .10$ (two-tailed tests).

Table 3: States with Term Limits

	House			Senate		
	Year	Change	Limit	Year	Change	Limit
Maine	1996	-0.71	8	1996	-0.22	8
California	1996	-1.59	6	1998	-1.02	8
Colorado	1998	-0.96	8	1998	-0.80	8
Arkansas	1998	-2.52	6	2000	-1.93	8
Michigan	1998	-2.33	6	2002	-1.27	8
Florida	2000	-1.03	8	2000	-0.42	8
Ohio	2000	-2.65	8	2000	-0.91	8
South Dakota	2000	-1.00	8	2000	-0.67	8
Montana	2000	-1.28	8	2000	-0.93	8
Arizona	2000	-0.96	8	2000	-0.72	8
Missouri	2002	-2.06	8	2002	-1.84	8

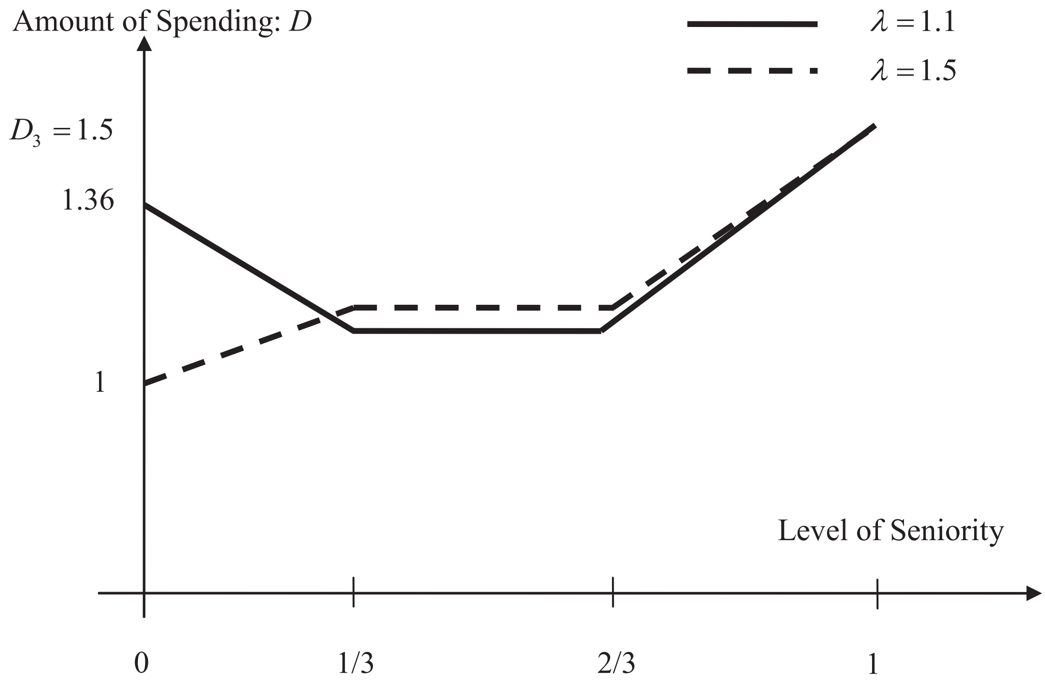
Note: "Year" denotes the first year when term limits became effective. "Change" denotes a change in the average level of seniority before and after the adoption of term limits. "Limit" denotes the maximum years of service. Term limits became effective in Oklahoma in 2004, Louisiana in 2007, and in Nevada in 2010, yet this information is not reflected in our analysis because our analysis focuses on years from 1980 to 2004.

Table 4: Term Limits and Government Spending

	(1) Senate	(2) House	(3) House
Small change by term limits	−19.723	35.092**	
	(14.376)	(15.102)	
Large change by term limits	170.299**	257.898**	
	(44.535)	(41.122)	
Eight year limit			42.182**
			(15.277)
Six year limit			279.041**
			(51.481)
Seniority	−97.130**	12.563	6.818
	(15.109)	(28.071)	(26.916)
Seniority squared	17.946**	−0.741	−0.328
	(3.146)	(3.524)	(3.474)
Seniority variance	2.770	41.018**	38.431**
	(23.598)	(13.026)	(13.339)
Gubernatorial term limits	−27.379**	−40.571**	−46.326**
	(13.068)	(14.027)	(12.180)
Divided government	24.420**	21.562**	20.819**
	(6.030)	(5.644)	(5.472)
Percent Democratic legislators	−0.943**	−0.243	−0.366
	(0.420)	(0.425)	(0.417)
Democratic governor	1.944	−0.083	0.074
	(8.460)	(9.625)	(9.305)
Percent unemployed	17.489**	20.753**	21.010**
	(5.082)	(4.751)	(4.755)
Personal income per capita (log)	−14.376	113.989	77.233
	(183.576)	(189.576)	(176.088)
GSP per capita (log)	604.218**	532.427**	554.269**
	(130.778)	(121.152)	(114.924)
Population size (log)	−434.331**	−400.505**	−417.498**
	(37.956)	(27.125)	(28.116)
Percent under 15 years old	−16.155**	−16.567**	−16.502**
	(6.029)	(5.975)	(6.069)
Percent over 15 years old	10.885	2.302	3.638
	(17.580)	(18.446)	(18.679)
R^2	0.924	0.930	0.923

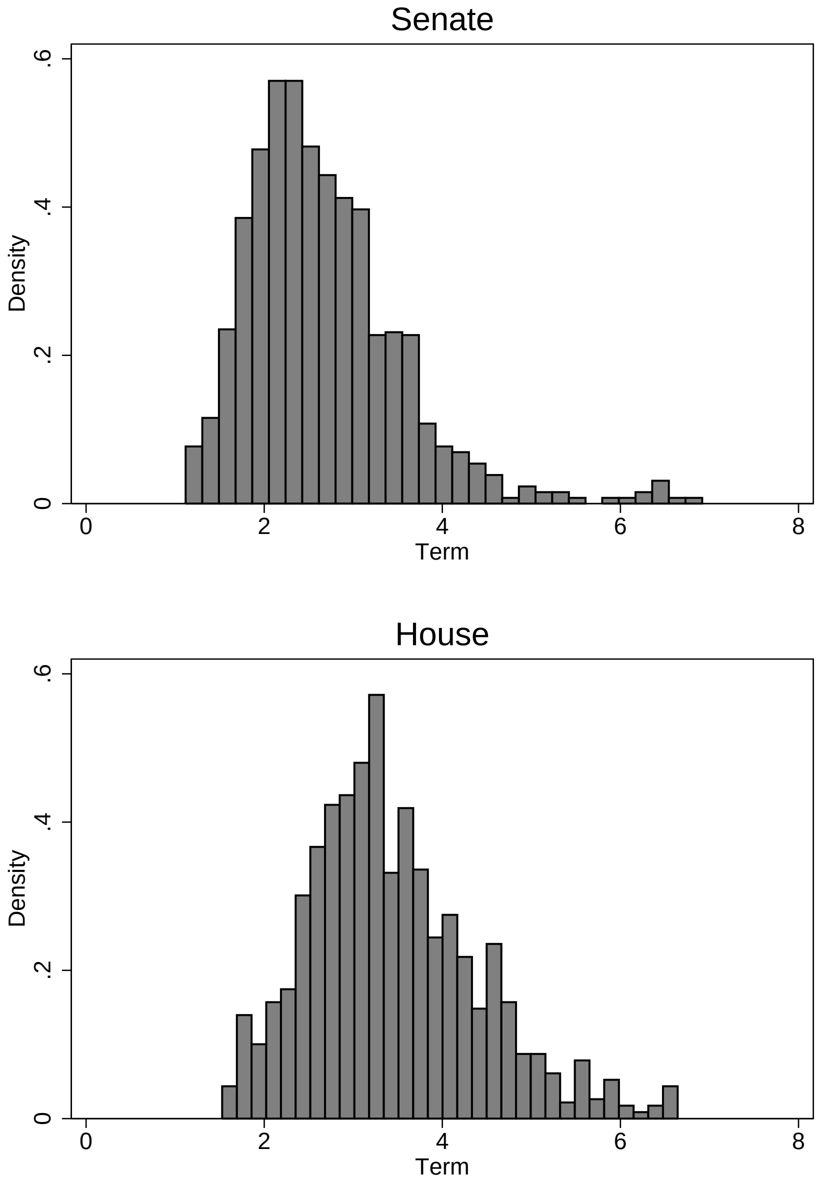
Note: Table entities are fixed effects regression estimates and standard errors in parentheses. Standard errors are estimated by Driscoll and Kraay's (1998) covariance matrix estimator. Estimates are based on data from 46 states between 1980 and 2004. The dependent variable is the amount of total government expenditures per capita in dollars. Column (1) uses the level of seniority and the percent of Democratic legislators in the state senate, while columns (2) and (3) use them in the state house. State and year fixed effects are included in the models. The number of observations is 1150. ∗∗ p < .05, ∗ p < .10 (two-tailed tests).

Figure 1: Amount of Spending with $k = 0.2$



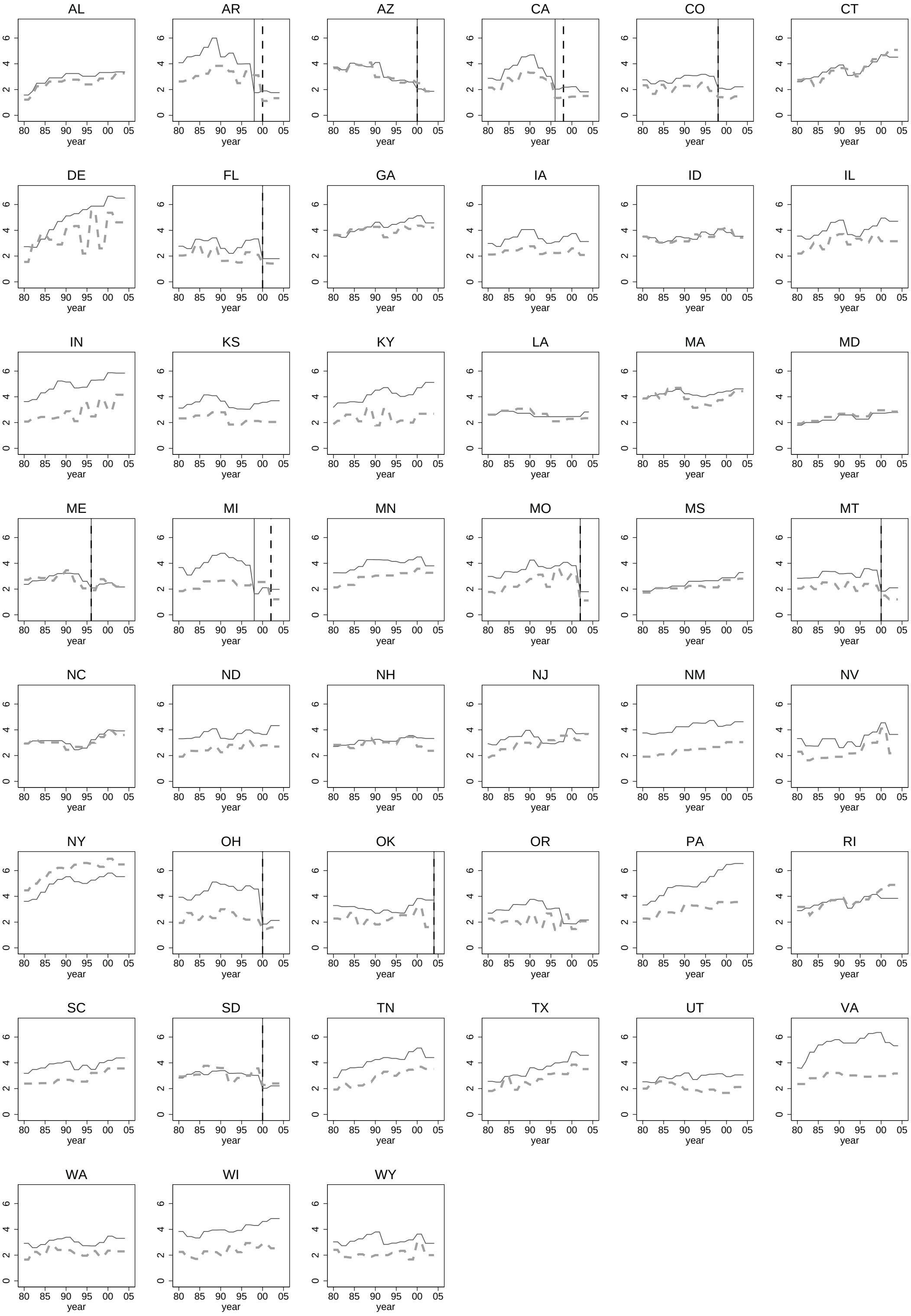
Note: The level of seniority is the average seniority in the legislature ($s/3$). As Proposition 1 indicates, when λ is sufficiently low, $D_1 = D_2$ is lower than D_0. On the other hand, when λ is sufficiently high, $D_1 = D_2$ is higher than D_0.

Figure 2: Distributions of Average Seniority in the Senate and House



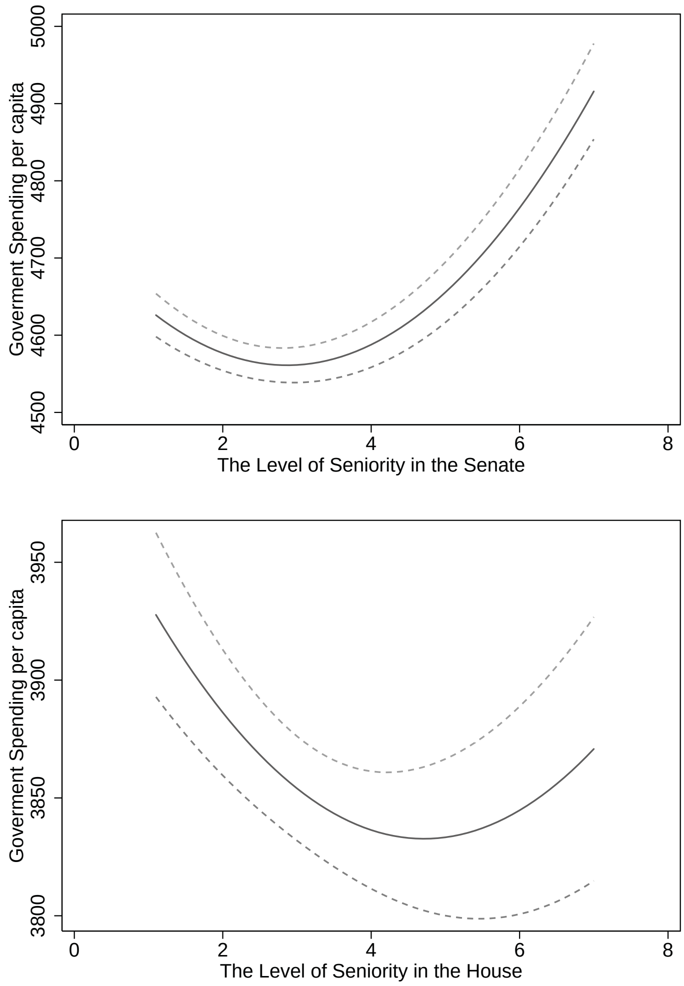
Note: Average seniority in the state senate and house is based on the average length of tenures of state senators and state house members.

Figure 3: Average Seniority in the Senate (dashed line) and the House (solid line)



Note: Average seniority in the senate and house is based on the average length of tenures of state senators and state house members.

Figure 4: Estimated U-shaped Relationships between the Level of Seniority and Government Spending



Note: The graphs are based on the estimated results reported in Table 2. Average seniority in the senate and house is based on the average length of tenures of state senators and state house members.