Distributional Politics and Electoral Incentives: Evidence from Seven US State Legislatures*

Toke Aidt† and Julia Shvets‡

April 2010

Abstract

We study the common pool problem that arises when fiscal decisions are made collectively by legislators representing different constituencies. We build a model to show that re-election prospects induce legislators to acquire large transfers for their constituency at the expense of the rest. We construct a unique data panel on fiscal transfers to legislative districts in seven US states. Legislative term limits allow us to identify the effect of electoral incentives. We find that legislators bring less money to their district when they cannot run for a re-election, consistent with the idea that electoral incentives aggravate the common pool problem.

Keywords: Term limits, collective decision making, electoral incentives, common pool problems, US state legislatures.

JEL Classifications: D72.

*We would like to thank seminar participants at Cambridge, Leicester, and PEUK and Clare Leaver and Ian Crawford for constructive comments and suggestions. Thanks to Michelle Jin and Chee Hui Koh for excellent research assistance and to Martin Oldfield for invaluable help with the geographical matching. This research is supported by CReMic and CQEH at the University of Cambridge and LCCI Commercial education trust.

†University of Cambridge, Email: tsa23@econ.cam.ac.uk.

‡University of Cambridge, Email: js591@econ.cam.ac.uk.

In modern democracies, elections serve a number of important functions. They are vehicles for aggregating preferences and information, but, at the same time, they also provide incentives that may bring the actions of legislators (more) into line with the desires of the voters they represent. By threatening not to reelect incumbents that do not perform, the electorate can keep legislators accountable and select the ones they like.

The incentive effects of elections have been subject to intense theoretical study.[1] Existing empirical research explores that the strength of the incentive effect of elections varies systematically with observable institutional features. In a seminal paper, Besley and Case (1995) exploit gubernatorial term limits in some of the US states: a rule that bans governors from running for reelection after a certain number of years in office. The governors are subject to electoral incentives as long as they can put their name forward for the next election, but these incentives disappear when the governor is up against a binding term limit. Besley and Case show that this change in incentives gives rise to a 'last term effect' in state fiscal policy: governors who can no longer run for reelection allow taxes to increase and spending to drift up. Focusing on more specific secondary policies, such as environmental regulation, List and Sturm (2006) also use gubernatorial term limits to demonstrate that spending on such policies changes when the governor can no longer run for reelection.[2]

The focus of this literature, both the theoretical and the empirical branch, is on how electoral incentives shape unilateral decisions made by a *single* legislator in isolation. In reality, fiscal decisions are rarely made unilaterally. The contribution of this paper is to inquire into the role of electoral incentives in the context of collective decision making

[1] See, e.g., Barro (1973), Ferejohn (1986), Banks and Sundaram (1993), Persson and Tabellini (2000), Maskin and Tirole, (2004), or Besley (2006).

[2] Another strand of literature uses variation in the quality of media to proxy differences in how well-informed the electorate is. This variation is used to demonstrate that legislators react to electoral incentives in ways that are consistent with political agency models. An example of this is Besley and Burgess's (2002) study of the link between newspaper circulation and government responsiveness to falls in food production and crop flood damage in Indian states. Yet another related literature studies political business cycles, i.e., whether there exists a distortion in macroeconomic aggregates or in fiscal and monetary policy variables in election years (see Alesina and Roubini (1997) for a survey).

where *many* legislators, representing their own geographically defined constituency, are involved in making the choice. This change of emphasis affects both the nature of the incentive effect and its welfare implications in important ways. In this context, a conflict arises between what is desired by the voters of each legislative district and what is optimal for the state as a whole. As a consequence of this common pool problem, elections acquire a more sinister role than in the situation with a single legislator: they create incentives for legislators to pander to parochial interests rather than to optimize the welfare of the state and may, in fact, magnify rather than resolve the underlying common pool problem.

Our analysis has two parts: a theoretical and an empirical part. First, we develop a new theoretical framework to explore the role of electoral incentives in the context of collective decision making. Within this framework, we introduce legislative term limits to derive testable predictions for how behavior of legislators changes when electoral incentives are removed. Second, we analyze data on the amount of transfers that US state legislators bring back to their constituencies, by contrasting the periods when the legislators can run for reelection with the periods when they cannot due to a binding term limit. Our empirical analysis differs from the previous studies that use term limits to estimate the impact of electoral incentives in two main ways: firstly, we consider legislative rather than gubernatorial term limits, and, secondly, our data track the flow of money from the state budget to individual legislative districts within a state, rather than aggregate state spending and taxes.

We build a political agency model with asymmetric information in which a number of legislators collectively determine state spending. Collective decision making gives rise to a common pool problem because voters within each constituency want more spending than what is socially optimal for the state as a whole. Legislators come in two types – those who care about state-wide welfare and those who care about the welfare of their own constituency only. We show that in a pandering equilibrium, even the legislators who care about state-wide welfare may choose suboptimal policies due to reelection

incentives. This result is in the spirit of Maskin and Tirole (2004). The difference is that in their model the voters insist on the suboptimal policy because they are badly informed, while in our model it is the common pool problem that drives pandering. In a signalling equilibrium, legislators who care about their constituencies only are forced to support over-spending to reveal themselves to their voters. Introducing term limits into the model gives rise to a testable prediction: the transfers from the state budget received by voters in a particular district fall when their representative can no longer run for reelection.[3] We refer to this as the 'last term effect'. Moreover, the model suggests that this reduction in spending is welfare improving, thereby providing a normative rationale for term limits.

To take this prediction to the data, we have collected a new data set covering the period from 1992 to 2005 in seven US states (Arizona, Colorado, Louisiana, Missouri, Ohio, Oklahoma and South Dakota). It contains information on the legislators elected to the lower chamber in these states and on the transfers from the state budget to individual legislative districts within each state. The data on district-specific transfers are unique and constructing these data can be seen as a major contribution of the paper.

State legislative term limits generate exogenous variation in the legislators' electoral incentives. We exploit this to analyze what happens to the transfers to a particular legislative district when the legislator representing that district can no longer run for reelection due to a binding term limit. Whilst we build on the earlier work that used gubernatorial term limits to study the effect of electoral incentives, we identify the 'last term effect' differently. The previous studies estimated the 'last term effect' by comparing a US state governor in his or her last term to governors within the same state who were not. The latter group contains governors who never reached the term limit. If voters use elections to select particular types of governors, then governors who

[3] This is true in our model despite the fact that all voters have identical preferences. In contrast, if one assumes – as it is commonly done in the literature – that all decisions are made by a single legislator rather than by many legislators collectively, the conflict disappears since the constituency of that legislator is the entire state.

are repeatedly reelected will differ systematically from those who are not. Consequently, one may not be able to identify the 'last term effect' separately from the selection effect of elections. The richness of our data enables us to address this issue. Within the same state, different legislative districts 'lose' their legislator due to binding term limits in different years. We can, therefore, identify the 'last term effect' by comparing how the transfers to a particular legislative district change when its legislator is up against the term limit relative to how much the district got in other periods in which that *same* legislator was not facing the term limit. In other words, we identify the 'last term effect' from within-legislator variation as opposed to within-district (or state) variation. This reduce significantly the possibility that selection effects or other unobserved factors contaminate the estimate.

We find strong evidence that transfers fall when legislators no longer face reelection incentives. On average, total transfers fall by $14 per capita in a legislator's last term relative to transfers secured by the same person in earlier terms. This corresponds to a 3.5 percent fall in spending. Our estimates are consistent with the notion that at least some legislators are conscious of the common pool problem. A further test shows that the obvious alternative explanation for the fall in spending – that legislators shirk in the absence of electoral incentives – is not supported by the data. Further analysis of the data show that the incentive effect is associated with Democrats only.

The rest of the paper in organized as follows. In section 1, we develop the model and summarize the features that guide our empirical investigation. In section 2, we discuss the construction of the data set and present some stylized facts. In section 3, we lay out our estimation strategy. In section 4, we present the empirical results. Section 5 and 6 are devoted to some additional tests. In section 7, we conclude.

1 The Model

The purpose of the model is two-fold. First, it serves to organize our thinking about the consequences of electoral incentives and term limits in the context of collective decision making. The existing literature on the subject tends to focus on situations with a single legislator, such as a governor or a head of state (see, e.g., Persson and Tabellini, 2000) rather than on collective decision making. Yet, virtually all fiscal decisions are made collectively by many legislators. Second, it serves to motivate our empirical analysis. We are interested not only in predictions about what might happen to the level of spending in particular legislative districts when their legislator is up against a binding term limit, but also in the welfare effects of electoral incentives and term limits more generally.

Collective decision making in real-world legislatures is complex. Here, we want to focus on two particular features that we believe are important, leaving aside many other features. Firstly, legislators are, typically, elected in particular districts. This creates an incentive for them to cater for district-specific interests. Yet, some legislators may be more socially-minded than this and have an intrinsic interest in doing what is socially right.[4] A central aspect of the model, then, is whether elections can be used as a selection device that allows the majority of voters in a district, who would normally be concerned only about their own welfare, to distinguish between different types of legislators. Secondly, when fiscal decisions are made by a collective of legislators rather than by a single legislator, a common pool problem naturally arises: each legislator may not internalize the full tax cost of his spending plans because the cost is shared by all voters, not only those who benefit from his spending plan. From a social point of view, an important question that our model seeks to answer is whether electoral incentives magnify or alleviate the underlying common pool problem.

[4] Although it is common in the literature on political agency to assume that all legislators are rent seekers (see, e.g., Persson and Tabellini, 2000) or effort minimizers (Ferejohn, 1986), we are not the first to depart from this assumption. In particular, legislators who have preferences that are aligned with social welfare play an important role in Besley (2006), Masking and Tirole (2004) and Aidt and Magris (2006).

1.1 The Economic and Political Structure

We consider a state with N legislative districts, indexed $k = 1, ..., N$. There are two periods, $t = 1, 2$. Each district elects one member to the legislature and is populated by a continuum of citizens with measure 1. All citizens have the discount factor $\beta \in (0, 1)$. There are two types of citizens, $T \in \{DM, WM\}$, in each district. Citizens of type DM are district maximizers. A district maximizer elected in district k is only concerned with the welfare of that district, i.e.,

$$v_{DM}(.) = y + v(p_k) - \tau, \tag{1}$$

where p_k is spending in district k, τ is a uniform lump sum tax, and y is income, which is assumed to be the same for all citizens. $v(.)$ is strictly concave and increasing in district spending. Citizens of type WM are state welfare maximizers. The objective function of the welfare maximizers of district k is a utilitarian social welfare function, i.e.,

$$v_{WM}(.) = \sum_{k=1}^{N} (y + v(p_k) - \tau), \tag{2}$$

and so they care, not only about what happens in their own district k, but also about what happens in the other districts. We can think of these citizens as having a natural inclination to do what is socially right, irrespective of what that might mean for the particular district in which they live. The ex ante probability that a citizen in a given district is of type DM (WM) is δ ($1 - \delta$). These probabilities are common knowledge and also represent the population fractions of the two types in each district. Moreover, type is a permanent attribute of a citizen and is private information, and is not observed directly by any other citizen. Welfare maximizers are in the minority in each district ($\delta > \frac{1}{2}$). Consequently, the majority of citizens, and, therefore, of voters in each district, want their representative to do what is best for the district even if this is socially sub-optimal.

The legislator representing district k is selected from among the citizens of that district by the majority rule. Consequently, legislators can either be of type DM or of type WM. Irrespective of his type, a legislator gains rents from holding office. We denote these by $M > 0$. A legislator who is out of office gets utility only from public spending according to his type, as any other citizen.

Collective decision making in the legislature is modelled as a non-cooperative game. In this game, each legislator chooses the spending that goes to his district, taking the spending decisions of the other legislators as given. This is done simultaneously. The lump sum tax is determined by the collective choices of the N legislators to balance the budget. The government's budget constraint is[5]

$$\sum_{k=1}^{N} p_k \leq N\tau. \tag{3}$$

We assume that $\tau \leq y$ and that there is a cap on district spending set at $p_k \leq y$.[6] The timing of events is as follows:

1. At the beginning of period 1, all citizens, including the person randomly selected to be the incumbent of each district, learn their own type.

2. A collective decision is made by the N incumbent legislators. It consists of a spending plan for each district and a common lump sum tax to finance total spending. The voters in district k observe the spending plan for their district, but not that for the others.

3. At the end of period 1, an election is held in which the incumbent in each district runs against a randomly chosen challenger. The candidate who gets the support of the majority of voters in the district gets elected for the second period.

[5] Most US states have a balanced budget requirement in their constitutions. In other contexts, borrowing and the intertemporal conflict of interest between different generations of voters may play a more important role.

[6] This assumption can be relaxed but maintaining it simplifies the presentation of certain non-essential features of the political equilibrium.

4. At the beginning of period 2, a new collective decision is made by the newly elected legislature.

The equilibrium concept is Perfect Bayesian Equilibrium (PBE). A PBE is a pair of first- and second-period spending plans, one for each type of legislator, where the individual components of the decision is a best response to the other components, and a reelection rule, set by the majority of voters, for each district such that in period 1

1. Incumbents of each type select an optimal spending plan given the reelection rule in his or her district and the spending plans of the other incumbents.

2. The reelection rule of each district is optimal given the voters' belief about the type of the incumbent and the incumbent's strategy.

3. Beliefs are whenever possible updated according to Bayes' Rule.

The majority of voters (henceforth, the voters) in each district will vote for the incumbent if the expected utility in period 2 with him or her in the seat is larger than the expected utility of electing a randomly chosen challenger.[7] We let ρ_k denote the vote decision of voters in district k, with $\rho_k = 1$ if the incumbent of the district is reelected and $\rho_k = 0$ if not.

1.2 Collective Decision Making

We need to characterize the outcome of the collective decision making process within a given period. This depends on the composition of the legislature. With N districts there are $N!$ different compositions of the legislature. Let the set of all possible compositions be Σ with elements σ. In the absence of any reelection incentives, the outcome of the collective decision making process is straight forward. For any given $\sigma \in \Sigma$, legislators

[7] In case of indifference between reelecting or not, we assume that voters reelect, as in Maskin and Tirole (2004).

of type DM choose

$$p^{DM} = \arg\max_{p_k} y + v(p_k) - \frac{p_k}{N} - \frac{\sum_{j \neq k} p_j}{N}, \tag{4}$$

while legislators of type WM choose

$$p^{WM} = \arg\max_{p_k} y + v(p_k) - p_k + \sum_{j \neq k} (y + v(p_j) - p_j). \tag{5}$$

District maximizers want to spend more than welfare maximizers ($p^{DM} > p^{WM}$) because they do not internalize the full tax cost of the spending that goes to their district. This is the underlying common pool problem. What is more, the voters of a particular district prefer $p^{DM} > p^{WM}$ despite this outcome being socially suboptimal. Voters will, therefore, try to use the power of the ballot box to get rid of legislators of type WM and reelect legislators of type DM. We also notice that while the optimal spending plan for each legislator does not depend on the choices made by the others (and hence on the composition of the legislature), the realized utility levels do. For legislators of type WM, this is so because they care about state-wide social welfare and, therefore, spending levels in all districts. For legislators of type DM, the reason is that the tax bill depends on what the other districts spend. The independence of optimal strategies greatly simplifies the analysis of political equilibria.

We compare two economies: one in which there is no term limit (i.e., legislators can be reelected at the end of period 1) and one in which there is a binding term limit (i.e., all or some of the legislators are forced to step down at the end of period 1). Term limits obviously make the vote decision at the end of period 1 redundant. As a consequence, legislators who are up against the term limit will simply select their type-specific optimal spending plan. The situation is more complex in an economy without term limits.

1.3 An Economy Without Term Limits

We begin by introducing some notation to describe the expected utility of legislators of different types in period 2 as a function of all the possible configurations of the legislature in that period. Consider a particular legislator, indexed k. It is useful to decompose the expected utility of this legislator into the part that comes from the consequences of the fiscal choices made by the legislature for his or her district (k) and the part that comes from the consequences of the fiscal choices for the $N-1$ other districts. Let Σ^{-k} be the set of all possible configurations of the legislature consisting of the $N-1$ other legislators and let a typical element be σ'. Moreover, let $v_k(\sigma', T)$ be the realized payoff for legislator k in period 2 if his own type is T and the rest of the legislature happens to be of configuration σ', excluding the contribution to utility that comes from the consequences of the spending plan for district k. Each configuration σ' arises with a certain probability depending on δ. For the incumbent of district k, his expected period 2 utility depends on his type (T), on the realized composition of the legislature (σ'), and on whether or not he is reelected (ρ). We can write the expected expected utility as

$$u_k(T, \rho) + \rho M + E_{\sigma'}\left[v_k(\sigma', T)\right], \tag{6}$$

where

$$\begin{aligned} u_k(T, 0) &= y + \delta\left(v(p_k^{DM}) - \frac{p_k^{DM}}{I_T}\right) \\ &\quad + (1-\delta)\left(v(p_k^{WM}) - \frac{p_k^{WM}}{I_T}\right) \end{aligned} \tag{7}$$

if legislator k is not reelected and he is replaced by a randomly selected challenger and

$$u_k(T, 1) = y + v(p_k^T) - \frac{p_k^T}{I_T} \tag{8}$$

if he is reelected to implement p^T for $T \in \{DM, WM\}$. $I_{WM} = 1$ and $I_{DM} = N$ and $E_{\sigma'}[v_k(\sigma', T)]$ represents expected utility associated with the spending plans for the $N-1$ other districts.

Focusing on pure strategy PBE, two types of equilibria can potentially emerge: pooling equilibria in which all types of legislators implement the same spending plan and separating equilibria in which the two types adopt different spending plans. To characterize equilibria, it is useful to define two critical values of the ego-rent. First, let the threshold M_1 be defined by the solution to the following equation:

$$\begin{aligned} v\left(p^{DM}\right) - p^{DM} &= (1-\beta\delta)\left(v(p^{WM}) - p^{WM}\right) + \\ &\quad \beta\delta(v(p^{DM}) - p^{DM}) - \beta M_1. \end{aligned} \tag{9}$$

This threshold controls whether incumbents of type WM have a strong or a weak incentive to mimic type DM. The large is the ego-rent, the stronger the incentive. If the ego-rent is very large, incumbents of type WM really want to mimic DM in order to get reelected. Incumbents of type DM will, therefore, have to 'over-spend' to convince voters that they are really district maximizers. The second threshold, M_2, controls if it is possible for incumbents of type DM to do so without having to spend more than y and is defined by the solution to[8]

$$\begin{aligned} v(y) - y &= (1-\beta\delta)\left(v(p^{WM}) - p^{WM}\right) + \\ &\quad \beta\delta(v(p^{DM}) - p^{DM}) - \beta M_2. \end{aligned} \tag{10}$$

Clearly, $M_2 > M_1 > 0$.

[8] Recall that the maximum possible spending in a given district is assumed to be y.

1.3.1 Pooling equilibria

We begin by studying pooling equilibria. In these equilibria the two types of incumbents select the same spending plan and voters learn nothing from observing what the incumbent of their district does in period 1.[9]

Proposition 1 *(Pooling Equilibrium) Suppose that*

$$M > M_1. \tag{11}$$

Then a pooling equilibrium in pure strategies exists. The equilibrium is supported by the following strategies and beliefs:

1. *All incumbents irrespective of their type select* p^{DM} *in period* 1.
2. *The voters in each district reelect their incumbent if and only if* $p_k = p^{DM}$.
3. *The voters' posterior belief that the incumbent of their district is of type* DM *is* δ.
4. *In period* 2*, incumbents of type* DM *select* p^{DM} *and incumbents of type* WM *select* p^{WM}.

We can interpret the pooling equilibrium as a pandering equilibrium. Legislators of all types pander to the wishes of the voters in their district, and those of type WM do this despite their innate desire to do what is in the best interest of the state as a whole. As a consequence, the underlying common pool problem is exaggerated.

Two additional comments are warranted. Firstly, out-of-equilibrium beliefs supporting this pooling equilibrium are reasonable: if the voters observe an out-of-equilibrium action, we assume that they believe that the legislator representing their district is of type WM with probability 1. Moreover, the equilibrium is not unintuitive in the sense

[9] All proofs are collected in Appendix A.

of Cho and Kreps (1987): a voter believes that the legislator is of type WM if he does anything else than spending p^{DM} in period 1. Secondly, for $M < M_1$, a pooling equilibrium in which both types play some $\widehat{p} < p^{DM}$ and are rewarded with reelection for doing so could exist. However, such an equilibrium *is* unintuitive.[10]

1.3.2 Separating Equilibria

The economy without term limits has two types of separating equilibria in which the type of incumbent is revealed at the end of the first period and only incumbents of type DM are reelected. In one type of equilibrium, which we call the *screening equilibrium*, voters are able to get legislators to reveal their type by implementing their type-specific optimal policy in the first period. In the other type of equilibrium, which we call the *signalling equilibrium*, incumbents of type DM distort their spending plan upwards to signal their commitment to the district they represent and are rewarded for doing so with reelection.

We begin by characterizing signalling equilibria. In general, there exist many of these, but we reduce the set to a singleton by imposing some mild restrictions on the out-of-equilibrium beliefs of voters.[11]

Proposition 2 *(Signalling equilibrium) Suppose that*

$$M_2 > M > M_1.$$

[10] The intuitive criterion can be stated as the following. If one type of legislator has a deviation which yields a payoff above the equilibrium payoff as long as the voters do not assign a positive probability that this deviation is made by the type for whom the deviation pays less than the equilibrium payoff, then we say that the PBE is unintuitive. In a pooling equilibrium with $\widehat{p} < p^{DM}$, there exist a p such that an incumbent of type DM would prefer that to playing $\widehat{p}$ *if* it could reveal his type (and get him reelected for sure), namely p^{DM}. On the other hand, an incumbent of type WM prefers to play $\widehat{p}$ and to elicit the equilibrium response from the voters in his district (reelect) to playing p^{DM} even if doing so would also yield reelection. This is because $\widehat{p}$ is closer to p^{WM}. We can, therefore, rule this type of equilibrium out as being unintuitive.

[11] The restriction is that voters believe that the incumbent in their district is of type WM if they observe any spending plan that is outside the set of plans what only type DM would be willing to choose.

Let $\widehat{p}^{DM}$ be the solution to

$$\begin{aligned} v(\widehat{p}) - \widehat{p} &= (1-\beta\delta)\left(v(p_k^{WM}) - p_k^{WM}\right) \\ &\quad +\beta\delta\left(v(p_k^{DM}) - p_k^{DM}\right) - \beta M \end{aligned} \tag{12}$$

and let $\widehat{p}^{WM}$ be the solution to

$$\begin{aligned} v(\widehat{p}) - \widehat{p} &= (1-\beta(1-\delta))\left(v(p_k^{DM}) - p_k^{DM}\right) \\ &\quad +\beta(1-\delta)\left(v(p_k^{WM}) - p_k^{WM}\right) - \beta M \\ &\quad +\frac{N-1}{N}\left[\beta(1-\delta)p_k^{WM} + (1-\beta(1-\delta))p_k^{DM} - \widehat{p}\right] \end{aligned} \tag{13}$$

for $\widehat{p} > p^{DM}$. A signalling equilibrium in pure strategies supported by the following strategies and beliefs exists:

1. *All incumbents of type DM select $\widehat{p}^{DM} > p^{DM}$ in period 1. All incumbents of type WM select p^{WM} in period 1.*

2. *The voters in each district reelect the incumbent if and only if $p_k = \widehat{p}^{DM}$.*

3. *The voters' posterior belief that the incumbent of their district is of type DM is 1 if they observe $\widehat{p}_k \in \left[\widehat{p}^{DM}, \widehat{p}^{WM}\right]$ and 0 if they observe $\widehat{p}_k = p^{WM}$.*

4. *In period 2, incumbents of type DM select p^{DM} and incumbents of type WM select p^{WM}.*

The equilibrium is unique within the class of separating equilibria if voters believe that the incumbent of their district cannot be of type DM if they observe out-of-equilibrium actions outside the set $\left[\widehat{p}^{DM}, \widehat{p}^{WM}\right]$.

This equilibrium shows that incumbents of type DM might have to exaggerate their desire to please the voters in their district and increase spending above p^{DM}. This is required when the value of holding office is large because the incentive of incumbents

of type WM to pretend to be of type DM is then large. However, if M is too large ($M > M_2$), then it is impossible within the budget for individual legislators of type DM to signal their type and the separating equilibrium does not exist. On the other hand, if M is relatively small, separation might emerge without any distortion, as the next proposition shows.

Proposition 3 *(Screening equilibrium) Suppose that*

$$M \leq M_1.$$

Then a separating equilibrium in pure strategies exists. The equilibrium is supported by the following strategies and beliefs:

1. *All incumbents of type DM select p^{DM} in period 1. All incumbents of type WM select p^{WM} in period 1.*

2. *The voters in each district reelect the incumbent if and only if $p_k = p^{DM}$.*

3. *The voters' posterior belief that the incumbent of their district is of type DM is 1 if they observe p^{DM} and 0 if they observe p^{WM}.*

4. *In period 2, incumbents of type DM select p^{DM} and incumbents of type WM select p^{WM}.*

In this case, the incentive of incumbents of type WM to mimic type DM is weak and voters can effectively screen their incumbents by asking for the spending plan that is optimal for their district. Importantly, while the common pool problem is exaggerated in the signalling equilibrium relative to the world without reelection incentives, this is not the case in the screening equilibrium.

1.4 The Effect of Term Limits

To draw out the consequences of term limits as clearly as possible, we compare the economy without term limits to one in which *all* legislators are term limited after period 1. In the term limited economy, all reelection incentives disappear and the incumbents simply select their type-specific optimal spending plan. How this compares with the economy without term limits depends on which equilibrium is played in that economy. We may begin by noting that if the ego-rent is sufficiently low $M \leq M_1$, then term limits will not affect fiscal outcomes at all (Proposition 3).[12] So, term limits only matter when the value of holding political office is large ($M > M_1$). In this case, we have multiple equilibria – both pooling and signalling equilibria may exist – but importantly irrespective of which is played the qualitative effect of term limits is the same. We can summarize the two main predictions of the model as follows:

Proposition 4 *Suppose that $M > M_1$.*

1. Average spending allocated to a legislative district is lower in the last period before the term limit becomes binding than in other periods.

2. Term limits improve social welfare.

The proposition shows that the spending allocated to a legislative district falls immediately before the term limit becomes binding for the legislator representing it. This negative 'last term effect' arises for two reasons. Firstly, term limits discourage welfare maximizers from pandering to the voters in their district. To see this, suppose the economy without term limits is in the pooling equilibrium. In this case, all legislators, irrespective of their type, select p^{DM}. This is higher than the average level of spending in the economy with term limits because the legislature will, on average, include a mixture of the two types, some of which will then select $p^{WM} < p^{DM}$. As a consequence, the

[12] Since we rule out uninutitive pooling equilibria, the screening equilibrium is the unique outcome for $M \leq M_1$.

common pool problem is alleviated and term limit improve social welfare. Secondly, they eliminate the need for district maximizers to 'over-spend' to convince their electorate that they are really district maximizers. To see this suppose that the economy without term limits is playing the signalling equilibrium. In this case, legislators of type WM select p^{WM} before and after term limits, but legislators of type DM reduce spending from $\widehat{p}^{DM}$ to p^{DM}. So, again, on average, spending falls in the last term alleviating the common pool problem. Moreover, social welfare improves because p^{DM} is closer to p^{WM} than $\widehat{p}^{DM}$.

Proposition 4 is based on the extreme assumption that all legislators become term limited at the same time and that all legislators play either the pooling or the separating equilibrium in the economy without term limits. It is clear, however, that a similar conclusion holds if only a subset of legislators becomes term limited after period 1 and/or if we allow some legislators to play the pooling while others play the separating equilibrium. The qualitative effect will be smaller but the direction is unambiguous: on average spending falls in the period before term limits become binding. More importantly perhaps, we note that the 'last term effect' is predicated on the assumption that legislators care sufficiently about holding office ($M > M_1$). If they don't and the screening equilibrium is played, we should not expect to see any 'last term effect'. Given that, our model can be rejected if we observe empirically that spending increases during the last term of a legislator.

2 Data

We have constructed a new data set for the US state House of Representatives in Arizona, Colorado, Louisiana, Missouri, Ohio, Oklahoma and South Dakota covering the period from 1992 to 2005.[13] All seven states have recently introduced term limits for how

[13] These states represent three out of four regions of the US: Midwest, South and West, and contain 12% of the US population.

long individual legislators can serve in their House of Representatives.[14] The data set contains information on transfers from the state budget to individual legislative districts, information about individual legislators, and information about term limit policies applicable to each state. The unit of observation is a legislator representing a particular legislative district in a particular state and year.

The US Census Bureau does not disaggregate the state accounts by legislative district. This poses a major problem, not only for our test of the 'last term effect', but for research on legislative politics in US states more generally. To overcome this problem, we propose to look at the accounts for the *recipients* of state funds rather than at the state accounts themselves. In particular, we use the accounts of counties, cities, town and township governments, school districts and special districts[15] to extract information on transfers from the state budget received by these local service providers in a given year.[16] Ansolabehere and Snyder (2006) also make use of these data but they focus on the counties only and do not attempt to allocate the state transfers to individual legislative districts. In contrast, we consider all these local service providers and we match the transfers to the legislative district or districts in which they are located. This provides an estimate of the size of the transfer from the state budget allocated to each legislative district in each year. About 23 percent of the total budget of the seven states in the sample can be attributed geographically in this way, but, as we discuss below, with a large variance across different spending categories.[17] The rest is spent on services that the state governments procure directly from the private sector or from public service providers that are not registered as official local government units. It is reasonable

[14] Of the fifteen states that currently have legislative term limits, the remaining eight are not in our sample because the data on geographical boundaries of their legislative districts were not available (California, Florida, Maine, Montana, Michigan, and Arkansas), because the term limits were not binding during the period we consider (Nevada) or because they do not have a House of Representatives (Nebraska).

[15] Special districts are divisions established for provision of a particular kind of public service: water districts, library districts, housing development agencies etc.

[16] These data are available from the US Census Bureau, see its Annual Survey of Governments and Quarterly Census of Governments at http://www.census.gov/govs/.

[17] This is net of spending on state government administration.

to presume that these services are mostly of a general nature and not geographically targeted. Given that, we believe that our data capture the bulk of state spending on *localized* public services.

To match the funds received by local service providers to particular legislative districts, we make use of the US Census Bureau Topologically Integrated Geographic Encoding and Referencing System (TIGER).[18] TIGER provides data on the geographical boundaries of local government units and school districts as well as data on the boundaries of state legislative districts. We matched the two sets of boundaries using custom-written software.[19] Smaller local service providers, such as town and township governments, are usually located in a particular legislative district in their entirety. On the other hand, larger local service providers, e.g., school districts, often straddle two or more legislative districts. In such cases, we attribute a share of the transfers to each legislative district. The share is equal to the percentage physical overlap between the jurisdiction of each provider and the legislative district.

Two important assumptions underlie this approach. First, it presumes that the geographical boundaries of a local service provider define the citizens who benefit from the state transfers channeled through that provider. In many instances (e.g., school spending within school districts) this approximates reality closely, but in others (e.g., spending on roads) the presumption is more doubtful. Second, our matching approach presumes that the benefits of the services funded by state transfers are spread evenly across the geographical area to which they are allocated. Violations of these two assumptions may lead us to attribute either too much or too little to a particular legislative district. This generates noise in the data on state transfers by legislative district. Yet, our estimates of the 'last term effect' are not biased by this since this noise is very unlikely to be correlated with whether or not a particular legislator is serving his or her last term as allowed under the state's term limit rules.

[18] See http://www.census.gov/geo/www/tiger/.

[19] This takes into account the effect of redistricting after the 2000 Census.

Table 1 shows the distribution of transfers to legislative districts in each of the seven states. On average, the districts receive US$400 per capita (in 1984 dollars), but there is significant variation across states, and large variation within states across legislative districts.[20] The real value of the transfers, averaged across all districts and states, rose steadily over the course of the sample period, from $326 per capita in 1992 to $466 per capita in 2005.

<Table 1: Total transfers from the state budget to legislative districts>

Our theory assumes that legislators control perfectly the amount of money that is allocated to their district. In reality, the extent to which a legislator can, in fact, influence the size of this transfer depends, amongst other things, on the type of spending. Some types of spending, such as welfare payments are very hard to influence because they usually follow federal or state rules and depend on individual claimant's characteristics. Other types are easier to influence. We only expect to observe the 'last term effect' for the latter type of spending. To take this into account, we group the transfers into two categories. The first category includes transfers that are likely to be outside the legislator's direct control (non-discretionary transfers). This includes so-called formula transfers to school districts (calculated using a pre-specified formula based on enrollment data), welfare payments, such as unemployment benefits, and transfers to local utilities (water, gas, electricity, and sewerage).[21] The second category includes transfers that the legislator is likely to have some direct influence over (discretionary transfers). This includes non-formula education spending, spending on highways, health, transport subsidies, housing, and local government support.

<Table 2: Breakdown of transfers to legislative districts by type of spending>

[20] We note that our geographical matching method overstates this variation relative to its true (unobserved) value.

[21] We have experimented with an alternative definion of non-discretionary transfers which excludes utilities. The results remain qualitatively unchanged.

Table 2 shows the breakdown of transfers by type. We notice that elementary and secondary education receives the largest per capita transfers, followed by local government support and spending on highways. Importantly, 87 percent of all state spending on elementary and secondary education is channelled through the school districts and can, therefore, be geographically attributed. For the other categories, such as spending on utilities, the share of direct state provision is much higher and the bulk of state spending in these categories cannot be attributed to particular legislative districts. This gives credence to the conjecture that the states use local service providers to deliver services with localized benefits, while they fund services with generalized benefits directly. The data in Table 2 also show that there is a lot of variation in transfers within each type. This variation has three sources: across states, across districts and across time. The variation is highest for discretionary transfers, with the coefficient of variation for this type of spending being two times as large as for non-discretionary transfers.

For each of the seven state House of Representatives, we record detailed information about all the state legislators who served during the sample period. This includes information on years of service, district represented, year of first election into the House, and party affiliation. This information was extracted from the State Elections Database constructed by Carsey et al. (2008), state legislative rosters, election records and blue books. The data set covers 1670 legislators, representing approximately 640 districts. The length of service varies from 1 year to 35 years, with an average of just over 9 years. The legislators in the sample are equally split between Republicans and Democrats.[22] Table 3 reports further details, broken down by state.

<Table 3: Some characteristics of the state legislatures in the seven states.>

Finally, the data set contains information on the legislative term limit rules applicable in each of the seven states.[23] During the 1990s legislative term limits were introduced

[22] A further 0.25% are in neither of the two main parties.

[23] The source for this is the National Conference of State Legislatures (http://www.ncsl.org/).

in twenty one US states.[24] Table 4 shows when the legislative term limits were adopted in the seven states in our sample. Using this information, we have calculated the year in which the term limit became binding for each legislator. This allows us to define the 'last term' for each individual legislator who survived for the maximum number of terms allowed under the state's term limit rules. There are 328 legislators who served for the maximum number of terms in our data set.

The fact that term limits was introduced during the sample period might raise concerns that the decision to adopt these limits could have been driven by the same unobserved factors that drove budget allocations. We observe, however, that, with the exception of Louisiana, term limits were introduced through citizen's initiatives. The citizen's initiative is a century-old institution that allows citizens to put proposals on the ballot. Whilst the reasons that led citizens in the states in our sample to force term limits upon their legislators through these initiatives might be related to state-wide political and economic conditions, they are unlikely to be correlated with conditions in particular legislative districts. Moreover, the term limits become binding for different legislators at different points in time in the same state House. For those reasons, we are confident that term limits do generate exogenous variation in the timing of when individual legislators had to step down and that is what we need for our test.

[Table 4: Legislative term limits in the seven states]

3 Empirical Specification

The main testable prediction of our model is that a district should, on average, receive less transfers when its representative serves his or her last term allowed under the state's term limit rules than otherwise (Proposition 4). To examine this prediction, we estimate

[24] Six of these subsequently repealed these term limits.

the following equation

$$y_{ijt} = \gamma(last\ term)_{ijt} + \boldsymbol{\alpha}'\mathbf{x}_{ijt} + \varepsilon_{ijt}, \tag{14}$$

where i denotes a legislator, j a state, and t a year. The variable y denotes the size of the (real) per capita transfer to legislator $i's$ district from the state budget in state j in year t. The variable *last term* is a dummy variable that takes on the value of one if the legislator is in his or her last term and zero otherwise. The vector $\mathbf{x}$ includes a number of dummy variables (fixed effects) and controls that we discuss in more detail below. Finally, ε_{ijt} is an error term. We are interested in the sign of γ. Our model predicts that $\gamma \leq 0$ and is rejected if $\gamma > 0$.

Clearly, the demographic, economic and political characteristics of voters differ across districts and this may cause them to prefer or need different levels of spending. Moreover, these characteristics could be correlated with the nature of politics in the district and may, therefore, affect the probability that a legislator 'survives' to the term limit. This makes it impossible to obtain an unbiased estimate of the 'last term effect' from between-district variation in spending. We could address this problem by introducing district fixed effect. In that case, the 'last term effect' would be identified by comparing legislators who are in their last term with legislators who are not, within the *same* district.

Yet, district fixed effects are not enough to get an unbiased estimate of the 'last term effect'. This is due to selection effects. Selection is an issue when we compare legislators who served the maximum number of terms to legislators who were voted out (or stepped down) earlier, even if the comparison is within the same district. This is because these two types of legislators are likely to be systematically different. To illustrate, suppose that our model is the true data generating process. In practice, we cannot observed the ego-rent of each legislator. Some districts represented by legislators with a high ego-rent may be in a pooling or signalling equilibrium while others, where the legislator has a low ego-rent, may be playing the screening equilibrium. Since we don't know which is

which we must pool all districts and all legislators together, and look for patterns in the average district. In districts where the screening equilibrium is played, the average transfer secured by the legislators who survive till the last term is higher than that of the rest. Similarly, in a district where the signalling equilibrium is played. This is because only legislators of type DM will ever reach the term limit. Consequently, in a district where the screening or the signalling equilibrium is played, we would expect spending to be higher, on average, for term limited legislators than for legislators who are not up against the term limit (a positive γ). At the same time, in districts where a pooling equilibrium is played, we expect the opposite (a negative γ) because some welfare maximizers would survive for the maximum number of terms. The net effect is an upwards bias in the estimate of γ, preventing us from identifying the incentive effect of elections separately from the selection effect.

We address this issue by estimating equation (14) with legislator fixed effects. By doing so, the last term served by a legislator is only compared to the earlier terms of that *same* legislator. Hence, for legislators who are playing the screening equilibria, γ should be zero because district maximizers can get reelected by implementing the district maximizing policy each period. For legislators who are playing the pooling equilibrium, γ should, on the other hand, be negative. Finally, for legislators who are playing the signalling equilibrium, γ may also be negative because once district maximizers have signalled their type early on by over-spending, they can get reelected to the end of the term by implementing a transfer policy closer to the district maximizing one. Although there still must be a critical mass of legislators playing the pooling or the signalling equilibrium for us to identify the incentive effect of elections, the estimate is no longer contaminated by selection effects.

As noted above, the real value of the spending, averaged across all districts and states, rose steadily during the sample period. Since term limits start to bind in the second half of our sample (from 1998 onwards), there is a positive correlation between legislators being in their last term and the size of the average transfer from the state

budget to legislative districts. To make sure this does not bias our estimate of the 'last term effect', we could introduce year fixed effects. This, however, is unlikely to be sufficient. The issue is that the general upwards trend in the real value of transfers from the state budget masks that the growth rate of the transfers differed substantially across states. This is shown in Figure 1. Aggregate year effects do not deal with this pattern. In order to take differential trends into account, we must control for state specific year effects.

<Figure 1: State specific differences in the growth rate of transfers >

To summarize, we estimate the 'last term effect' in a specification that includes legislator specific fixed effects and state specific year effects. The latter implies that we compare the transfer that a particular legislator brings to his or her district to the amount received by an average district in that state in that year. The former implies that we identify the 'last term effect' by comparing the amount of transfers the legislator brought to his or her district (relative to what an average district got in that year in that state) in the legislator's last term to that he or she brought to the district in previous terms.

While this identification strategy effectively deals with state specific over time fluctuations in spending and with the concern that those legislators who 'survive' to the term limit are systematically different from those who do not, the estimate of the 'last term effect' could be biased if time varying unobserved factors for individual legislators are important. One particular concern is learning-by-doing or experience effects. Such effects would imply that the transfer that a particular legislator secures for his or her district may rise with years of service. Importantly, however, although we cannot rule experience effects out, we stress that they work against finding a negative 'last term effect'.

4 Evidence on the Incentive Effect of Elections

We present the evidence on the incentive effect of elections in three sub-sections. The main results are presented in the next section, the following section investigates party differences and the third section discusses some robustness checks.

4.1 Main Results

Table 5 reports our headline estimates of the incentive effect of elections using the variation in electoral incentives due to legislative term limits.[25] The first column reports the result for the total per capita transfer to each legislative district. We see the transfers fall in the legislator's last term, and this effect is significant at the five percent level. On average, total transfers fall by \$14 per capita in a legislator's last term relative to other terms served by him or her. This corresponds to a 3.5 percent fall in the average district. In column 2, we report the results when we restrict attention to education spending only. As noted in the discussion of Table 1, transfers for primary and secondary education are targeted at well-defined geographical areas and constitute the largest component of total transfers. It is, therefore, of special interest to look for 'last term effects' for this sub-category. We observe a statistically significant fall in education transfers in the last term of a legislator in the order of \$10 per capita. In columns 3 and 4, we report the results for discretionary and non-discretionary transfers separately. Conceptually, we expect the 'last term effect' to be present for spending items over which legislators have (some) discretion as opposed to items which are based on pre-specified formulas. In line with this conjecture, we see that discretionary transfers fall in a legislator's last term (column 3), while the effect is insignificant for non-discretionary spending (column 4). The magnitude of the effect for discretionary spending is about \$9 per capita. Overall, these estimates are consistent with the notion that at least some legislators are conscious

[25] Some districts are represented by more than one legislator. In these cases, we matched each legislator with the total transfer to the district. For this reason, we cluster at district-year level when estimating all standard errors.

of the common pool problem, and prefer to spend less than what their voters demand when they are not under pressure to be reelected.

[Table 5: Test of the 'last term effect': The main results]

4.2 The Role of Political Parties

Political parties play an important role in US politics, and the differences between Democrats and Republicans are often seen as more important than differences between individual legislators within the same party. Hence, one may conjecture that the behavior of individual legislators is influenced by their party affiliation. If, for example, a party cares about the welfare of all the districts that vote for it, then the party internalizes, at least partially, the common pool problem. In terms of our model, the policy preferred by the party will be somewhere in between p^{WM} and p^{DM}. Whether individual legislators toe the party line depends on how much discipline the party has over its members. Since the time horizon of a party is much longer than that of individual legislators, strong party discipline will not only internalize some of the common pool externality, it would also prevent individual legislators from following their own agenda in their last term insofar as this is inconsistent with preserving the party's reputation amongst voters (see, e.g., Alesina and Spear, 1988). Strong party discipline thus dilutes the last term effect and may vary systematically by party. One way of conceptualizing this within our modelling framework is to allow legislator specific characteristics such as ego-rents and discount factors to be affected by party affiliation.[26] As a consequence, legislators from different parties could be playing systematically different equilibria.[27]

[26] Dhami (2003) offers an alternative theoretical explanation of why the distortion in policy is party-specific.

[27] To be concrete, suppose that there are two parties L and R and that M_i varies by party with $M_L > M_R$. If $M_L > M_1 > M_R$, we expect to see systematic differences between districts where the incumbent is from party L (they play the signalling or the pooling equilibrium) and districts where the incumbent is from party R (they play the screening equilibrium). In this example, there will be no 'last term effect' in districts controlled by party R while in districts controlled by party L spending will fall during the final term of their legislator.

Moreover, systematic differences in party discipline may eliminate the 'last term effect' for some parties but not for others.

To allow for these possibilities, we ask whether membership of the Democratic or the Republican Party makes a difference for last term behavior. Specifically, we introduce three dummy variables into specification (14): one dummy variable for whether the legislator is a Democrat or not (*Democrat*)[28] and two dummy variables that are equal to one if a Democrat or a Republican, respectively, is in his or her last term (*Last term, Democrat (Republican)*). The results are reported in Table 6.

[Table 6. Test of the 'last term effect': Democrats versus Republicans]

We see that the 'last term effect' is only significant among Democrats. According to the estimate reported in column 1, they bring about $17 per capita less back to their district when they serve their last term. For education transfers, the estimate is slightly smaller (column 2) and the 'last term effect' is associated with discretionary spending items (columns 3 and 4). This suggests that the Republican Party either is more effective at imposing party discipline or that Republican legislators, on average, value political office less than their Democratic counter-parts (so that they play the screening equilibrium) perhaps because they face better outside options in the private sector. It is interesting to observe that this finding is in line with Besley and Case (1995). They find for US state governors that the 'last term effect' is associated with Democrats, not with Republicans.

4.3 Robustness Test

The amount of transfers that districts receive are likely to depend on district characteristics, as well as on the behavior of the district's representative. By including legislator

[28] Since we include legislator fixed effects, the direct effect of party affiliation on the size of the average district transfer (captured by the coefficient on the *Democrat* variable) is identified from legislators who change their party while in office. There are very few such cases, and, unsurprisingly, the coefficient on this variable is insignificant

specific fixed effect into our regressions, we compare earlier and later terms of the same legislator, and district characteristics that are fixed over time are not contributing to the identification of the 'last term effect'.[29] Yet, it is possible that districts evolve over time. Omitting district characteristics that change over time and affect transfers may bias our estimate of γ if they are also correlated with the timing of the legislator's last term. However, since the timing of the legislator's last term is determined by the year when the legislator was first elected into the House, it is not easy to think of reasons why such a relationship should exist.

Nevertheless, to address this potential concern, we have constructed three time-varying control variables: the proportion of the population over 65, the proportion of children of school-age and income per capita. These data are not available at the district level, and so, we constructed them from county data using the same geographical overlap technique that we used to construct the district specific transfers. When we add these variables to equation (14), we find a statistically significant negative 'last term effect' among Democrats. In particular, we observe a fall in education spending in the order of \$12 per capita and, as before, this result is driven by discretionary rather than formula-based spending [not reported].[30]

5 Pandering or Signalling?

The theory developed in section 1 delivers a number of additional predictions. These predictions are testable and can help us understand whether the negative 'last term effect' observed in the data is generated by welfare maximizers pretending to be district maximizers (as in a pooling equilibrium) or by district maximizers who are trying to reveal themselves to voters by over-spending (as in a signalling equilibrium).

The first of these tests looks at the average size of the transfer delivered by legislators

[29] This statement is true since virtually no politicians change districts in our sample.

[30] The controls themselves are mostly significant. Districts with more school-aged children and lower income per capita get higher transfers.

who get reelected and the average size of the transfer delivered by legislators who do not. In a pooling equilibrium, this difference is approximately zero. This is because the mixture of types is the same amongst those who are reelected and those who are not.[31] In contrast, in a signalling equilibrium, this differential is positive. This is because only district maximizers are reelected and they secure relatively large transfers to their district throughout the entire term in office, while welfare maximizers, who are voted out, do not. Table 7 shows the results of two estimations designed to test this prediction.[32] Neither regression can be interpreted as causal, but the coefficients should tells us whether the relationship predicted by the signalling equilibrium is present. The first estimation asks whether there is a relationship between the number of years that a legislator serves and the total transfer received by his or her district. The answer, shown in column 1, is that no such relationship can be found, and the same message comes through when we disaggregate the fiscal data and include controls for district characteristics [not reported].[33] The second estimation compares the average transfer secured by legislators who stayed for the maximum number of years, i.e., till the term limit, with that secured by the rest. Again, we find no difference (column two). This is inconsistent with the signalling equilibrium and thus points in the direction of a pandering equilibrium.

[Table 7. Average transfers and years of service]

[31] Strictly speaking, in the model all legislators get reelected along the equilibrium path, but one might imagine that sometimes a legislator lose an election because of random events. In that case, the average transfer generated by a legislator who stay to the end might be slightly smaller than that of a legislator who lost an election before that. This is due to the drop in transfers in the last term.

[32] We restrict the sample to the period after term limits were introduced in the seven states.

[33] This is true for all legislators who were elected after term limits were introduced. If we include legislators elected before the introduction of term limits (some of whom stayed in office for over 30 years), we do find a positive relationship between years of service and formula-based education transfers, but not for any other spending category.

6 Alternative Explanations

We interpret the negative 'last term effect' as evidence that electoral incentives compound the underlying common pool problem. However, there is an (obvious) alternative interpretation of the finding: it could be due to systematic differences in the effort legislators put into securing funds to their districts. In their last term, legislators simply slack off relative to other terms during which they face a reelection incentive, and, as a consequence, transfers to their district go down. Of course, some legislators might be inherently better at securing funds for their district than others and so, voters might, as in Besley and Case (1995), use elections to select the most efficient ones. This can manifest itself either as pooling equilibria or as separating equilibria. In the former type of equilibria, inefficient types pretend to be efficient by putting in extra effort in the quest for resources for their district until they face the term limit. In the latter, efficient types put in extra effort to signal that they are, indeed, very efficient, except when they face the term limit. In either case, the prediction is a fall in transfers to districts represented by legislators who are up against the term limit. We shall refer to this as the '*effort model*'.[34]

The central feature of the 'effort model' in the context of collective decision making is that legislators are embedded in a conflict situation in which they are fighting to get a larger share of the total budget allocated to their district.[35] A direct consequence of this is that the allocation that a particular district gets *must* depend on the behavior of the legislators representing the other districts. Since the legislators who are up against the term limit have an incentive to exert less effort, the 'effort model' predicts that the transfer that a particular district gets depends positively on how many of the legislators representing the other districts face a binding term limit. In contrast, the 'common pool model' does not necessarily imply such a relationship. In fact, in the version presented in section 1, the transfers secured for a given district are independent of whether the

[34] A sketch of such a model is available upon request.

[35] Otherwise, the assumption that transfers to one's district require costly effort is difficult to justify.

other legislators are facing a term limit or not. Of course, it is possible to construct extensions of the model where this would not be the case, but the point we want to explore here is that the 'common pool model' does not require such interdependence while the 'effort model' does. We use this observation to discriminate between the two models.

[Table 8: The 'effort model' versus 'common pool model': a test]

In Table 8, we present the result of a test of whether or not the transfer to a district in a given year depends on the number of legislators in other districts who are serving their last term (*number of 'last term' legislators*). We only include districts represented by legislators who are not in their last term (the results do not change if we include all districts). The 'effort model' predicts that the coefficient on this variable is positive, while the 'common pool model' is consistent with a zero coefficient. We see that the coefficient is negative but highly insignificant. We interpret this as evidence against the 'effort model'. This result is not affected by inclusion of legislator fixed effects or by omitting district controls [not reported].

Another way to distinguish between the two theories is to look for more direct evidence that legislators put less effort into the legislative process when they are serving their last term. One of the more time consuming responsibilities in a legislature is that of being a committee chair. If legislators shirk in the last term, they will to try to avoid being committee chairs. Using data on legislators' responsibilities in the House, which we have collected for five of the states in the sample, we find that the opposite is true: legislators in their last term are more likely to be serving as chairmen. This is not consistent with the idea that legislators minimize effort during their last term[36].

[36] We do not report the details of these data and tests here, but they are available on request.

7 Conclusion

A large body of theory in political economics is predicated on the assumption that electoral incentives matter for the behavior of legislators. This paper adds new empirical evidence in support of this assumption. We explore the variation in electoral incentives generated by limits on how long legislators are allowed to serve, but, in contrast to the previous literature, we do this in the context of collective decision making. Exploring a rich, new data set on public spending by legislative district in seven US states, which enforce term limits for individual legislators, we find strong evidence of a negative 'last term effect'. The magnitude of the effect is about 3.5 percent of the total per capita transfer from the state budget to the district. We interpret this as evidence of a conflict of interest between the objectives of some of the legislators and those of the voters they represent and argue that (some) legislators in the absence of reelection concerns want to alleviate the common pool problem associated with collective decision making.

One intriguing aspect of our results is the strong party difference in the effects of electoral incentives: we find that Democrats respond to parochial incentives, but Republicans do not. A possible interpretation of this is that Republicans have greater party discipline. This raises a number of interesting questions for future research about the mechanisms through which parties help alleviate the common pool problem inherent in collective decision making as well as other incentive problems.

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Appendix A: Proofs

Proof of proposition 1. The strategies for period 2 are optimal for the two types of legislators since there is no reelection concern. Given the reelection rule, it is optimal for an incumbent of type DM to select p^{DM} in period 1. For an incumbent of type WM, there is a trade off in period 1. Consider the incumbent in district k and fix the equilibrium strategies of the other legislators, denoting them by p^*_{-k} with elements p^*_j for $j \neq k$. If an incumbent of type WM seeks reelection in district k, his payoff will be

$$\begin{aligned} & y + v(p_k^{DM}) - p_k^{DM} + \sum_{j \neq k} \left(y + v\left(p_j^*\right)\right) - \sum_{j \neq k} p_j^* + M \\ & + \beta \left[M + u_k\left(WM, 1\right) + E_{\sigma'}\left[v_k(\sigma', WM) | \, p^*_{-k}\right]\right]. \end{aligned} \tag{15}$$

If he decides not to seek reelection, he implements the short-term best spending plan for the district he represents $\left(p_k^{WM}\right)$ and gets

$$\begin{aligned} & y + v(p_k^{WM}) - p_k^{WM} + \sum_{j \neq k} \left(y + v\left(p_j^*\right)\right) - \sum_{j \neq k} p_j^* + M \\ & + \beta \left[u_k\left(WM, 0\right) + E_{\sigma'}\left[v_k(\sigma', WM) | \, p^*_{-k}\right]\right]. \end{aligned} \tag{16}$$

Comparing and rearranging these two equations give

$$\begin{aligned} v\left(p^{DM}\right) - p^{DM} \quad \geq \quad & (1 - \beta\delta)\left(v(p^{WM}) - p^{WM}\right) + \\ & \beta\delta(v(p^{DM}) - p^{DM}) - \beta M \end{aligned} \tag{17}$$

which is satisfied for all $M \geq M_1$. Given the common strategy of all types of incumbents, voters learn nothing and cannot update their beliefs. As a consequence, they are indifferent between reelecting the incumbent and trying a challenger. We assume the tie is broken in favor of the incumbent.

Proof of proposition 2. The strategies for period 2 are optimal for the two types of

legislators since there is no reelection concern. Consider the incumbent in district k in period 1. Fix the equilibrium strategies, denoted p^*_{-k} with elements p^*_j for $j \neq k$, of the other legislators. Firstly, suppose the legislator of district k is of type WM. If he seeks reelection by mimicking the equilibrium strategy of incumbents of type DM, his payoff is

$$\begin{aligned} & y + v(\widehat{p}_k) - \widehat{p}_k + \sum_{j \neq k} \left(y + v\left(p^*_j\right)\right) - \sum_{j \neq k} p^*_j + M \\ & + \beta \left[M + u_k\left(WM, 1\right) + E_{\sigma'}\left[v_k(\sigma', WM) | \, p^*_{-k}\right]\right]. \end{aligned} \tag{18}$$

If, on the other hand, he plays his equilibrium strategy p_k^{WM} he gets:

$$\begin{aligned} & y + v(p_k^{WM}) - p_k^{WM} + \sum_{j \neq k} \left(y + v\left(p^*_j\right)\right) - \sum_{j \neq k} p^*_j + M \\ & + \beta \left[u_k\left(WM, 0\right) + E_{\sigma'}\left[v_k(\sigma', WM) | \, p^*_{-k}\right]\right]. \end{aligned} \tag{19}$$

Comparing and rearranging these equations yields the following restriction on $\widehat{p}_k$:

$$\begin{aligned} v(\widehat{p}_k) - \widehat{p}_k \quad \leq \quad & (1 - \beta\delta)\left(v(p_k^{WM}) - p_k^{WM}\right) \\ & + \beta\delta\left(v(p_k^{DM}) - p_k^{DM}\right) - \beta M. \end{aligned} \tag{20}$$

For $M \geq M_1$, this condition is only satisfied for $\widehat{p}_k > p^{DM}$ since $v(p_k) - p_k$ is a decreasing function of p_k for $p_k > p^{WM}$.

Second, consider an incumbent of type DM. If he plays the equilibrium strategy $\widehat{p}_k$ to get reelected, he gets

$$\begin{aligned} & y + v(\widehat{p}_k) - \frac{\widehat{p}_k}{N} - \frac{\sum_{j \neq k} p^*_j}{N} + M \\ & + \beta \left[M + u_k\left(DM, 1\right) + E_{\sigma'}\left[v_k(\sigma', DW) | \, p^*_{-k}\right]\right]. \end{aligned} \tag{21}$$

If, on the other hand, he deviates to the short-term optimal spending plan p_k^{DM} with

the consequence that he is not reelected, he gets

$$\begin{aligned} & y + v(p_k^{DM}) - \frac{p_k^{DM}}{N} - \frac{\sum_{j \neq k} p_j^*}{N} + M \\ & + \beta \left[u_k \left(DM, 0 \right) + E_{\sigma'} \left[v_k(\sigma', DM) | \, p_{-k}^* \right] \right]. \end{aligned} \tag{22}$$

Comparing and rearranging these equations yields the following restriction on $\widehat{p}_k$:

$$\begin{aligned} v(\widehat{p}_k) - \widehat{p}_k \;\; \geq \;\; & (1 - \beta(1-\delta)) \left(v(p_k^{DM}) - p_k^{DM} \right) \\ & + \beta \left(1 - \delta \right) \left(v(p_k^{WM}) - p_k^{WM} \right) - \beta M \\ & + \frac{N-1}{N} \left[\beta \left(1 - \delta \right) p_k^{WM} + (1 - \beta(1-\delta)) p_k^{DM} - \widehat{p}_k \right], \end{aligned} \tag{23}$$

where we have used that $\frac{p}{N} = p - \frac{N-1}{N} p$. Let $\widehat{p}_k^{DM}$ and $\widehat{p}_k^{WM}$ be the solutions to equations (20) and (23), respectively, for $p > p^{DM}$. We can calculate the difference between the right hand side of equation (23) and equation (20):

$$\begin{aligned} & (1-\beta) \left[\left(v(p_k^{DM}) - p_k^{DM} \right) - \left(v(p_k^{WM}) - p_k^{WM} \right) \right] + \\ & \frac{N-1}{N} \left[\beta \left(1 - \delta \right) p_k^{WM} + (1 - \beta(1-\delta)) p_k^{DM} - \widehat{p}_k \right] \\ < \;\; & 0 \end{aligned}$$

for all $\widehat{p}_k > p^{DM}$. Since $v(p_k) - p_k$ is maximized at $p_k = p^{WM}$, it follows that $\widehat{p}_k^{WM} > \widehat{p}_k^{DM}$ and that all $\widehat{p}_k \in \left[\widehat{p}_k^{DM}, \widehat{p}_k^{WM} \right]$ will generate separation. Given that, Bayes' rule requires that the voters in district k believe that their incumbent is of type DM if $p_k = \widehat{p}_k$ and of type WM if $p_k = p^{WM}$. It is, therefore, a best response for voters in district k to reelect if $p_k = \widehat{p}_k$ and not to reelect if $p_k = p^{WM}$.

We can reduce this set to a singleton if we impose the restriction that voters believe that the incumbent in of type DM not only if they observe the equilibrium action $\widehat{p}_k$ but for *all* $p_k \in \left[\widehat{p}_k^{DM}, \widehat{p}_k^{WM} \right]$. In this case, an incumbent of type DM can pick his most-preferred separating strategy and that is the one where $\widehat{p}_k = \widehat{p}_k^{DM}$. This is the unique

undominated separating equilibrium and is supported by out-of-equilibrium beliefs that any $p_k \notin \left[\widehat{p}_k^{DM}, \widehat{p}_k^{WM}\right]$ must have been generated by type WM. If M is larger than M_2, it is impossible within the budget for individual legislators to signal their type and the separating equilibrium cannot exist.

Proof of proposition 3. The proof is similar to that of Proposition 2 with one major difference. Since condition (23) holds at $\widehat{p}_k = p^{DM}$, incumbents of type DM are trivially willing to play their period 1 strategy, i.e., p^{DM}. Given that, we can evaluate condition (20) at $\widehat{p}_k = p^{DM}$ to see that it is satisfied for all $M \leq M_1$. Given Bayes consistent beliefs, the reelection strategy of voters in district k is a best response.

Table 1. Total transfers from the state budget to legislative districts

Per capita 1984 US$

State	Mean	Standard deviation	N	Share of transfers in total state spending per capita
Arizona	557	473	720	0.34
Colorado	426	364	780	0.26
Louisiana	384	386	1,470	0.19
Missouri	347	164	1,956	0.21
Ohio	498	177	1,188	0.27
Oklahoma	398	220	1,214	0.23
South Dakota	262	160	840	0.15
Total	400	294	18,383	0.23

Table 2. Breakdown of transfers to legislative districts by type of spending

Per capita 1984 US$

Type	Mean	Standard deviation	Min[1]	Max	Share of transfers in total state spending on this activity
Discretionary transfers, total	186	309	1	11,089	
Education, non-formula	88	171	0	5,918	0.87[2]
Local government support	40	122	0	4,179	1
Highways	26	31	0	898	0.15
Health	10	34	0	1,439	0.07
Housing	1	6	0	441	0.23
Transit	2	10	0	255	0.37
Other	19	38	0	1,341	n/a
Non-discretionary transfers, total	286	246	0	2,848	
Education, formula	267	229	0	2,844	0.87[2]
Welfare	18	62	0	1,732	0.07
Utilities	0.6	4	0	106	0.01

N = 18,383

[1] zero transfers were received in several districts in Oklahoma in 1993.
[2] share of all primary & secondary education transfers in total state spending on primary & secondary education, using post-1995 data.

Table 3. Some characteristics of the state legislatures in the seven states

State	Number of legislators	Number of districts	Sample years	Democrats, share of total
Arizona	174	30	1993-2004	0.37
Colorado	175	65	1993-2004	0.41
Louisiana	210	105	1992-2005	0.74
Missouri	396	163	1993-2004	0.53
Ohio	236	99	1993-2004	0.42
Oklahoma	184	101	1993-2004	0.60
South Dakota	199	35	1993-2004	0.32
Total	1670	640		

Table 4. Legislative term limits in the seven states

State	Year of first election under TL	Maximum allowed service under TL (years)	Year of when TL first bind (first set of legislators steps down)	Number of legislators that step down at TL	Average service before TL first bind	Average service after TL first bind
Arizona	1992	8	2000	27	7.7	5.6
Colorado	1990	8	1998	41	8.5	6.4
Louisiana	1995	12	2007	49	15.1	n/a
Missouri	1994	8	2002	87	10.9	8.9*
Ohio	1992	8	2000	67	12.3	6.6
Oklahoma	1992	12	2004	29	13.6	n/a
South Dakota	1992	8	2000	28	8.3	5.8
Entire sample				328	11.7	6.3

* This is greater than 8 due to provisions for special elections in Missouri. TL = term limits.

Table 5. Test of the 'last term effect': The main results

	(1)	(2)	(3)	(4)
	Transfers per capita			
	Total	Education	Discretionary	Non-discretionary
Last term	-0.014*	-0.010*	-0.009*	-0.005
	(0.007)	(0.004)	(0.004)	(0.004)
N	8,660	8,660	8,658	8,658
Year fixed effects	Yes	Yes	Yes	Yes
Legislator fixed effects	Yes	Yes	Yes	Yes

Robust standard errors in parentheses, clustered at district-year level

** significant at 1% level, * significant at 5% level, + significant at 10% level

Table 6. Test of the 'last term effect': Democrats versus Republicans

	(1)	(2)	(3)	(4)
	Transfers per capita			
	Total	Education	Discretionary	Non-discretionary
Last term, Democrats	-0.017*	-0.016**	-0.013*	-0.004
	(0.008)	(0.006)	(0.005)	(0.005)
Last term, Republicans	-0.012	-0.005	-0.006	-0.006
	(0.008)	(0.005)	(0.004)	(0.005)
Democrat	0.007	-0.001	-0.000	0.008
	(0.015)	(0.014)	(0.007)	(0.012)
N	8,660	8,660	8,660	8,658
Year fixed effects	Yes	Yes	Yes	Yes
Legislator fixed effects	Yes	Yes	Yes	Yes

Robust standard errors in parentheses, clustered at district-year level

Table 7. Average transfers and years of service

	(1)	(2)
	Dep var: Total transfer per capita	
Total years in office	-0.000	
	(0.003)	
Served maximum allowed term		-0.040
		(0.029)
N	2,604	2,612

Regression includes state-specific year effects

Robust standard errors in parentheses, clustered at legislator level

** significant at 1% level, * significant at 5% level, + significant at 10% level

Table 8. The 'effort model' versus 'common pool model': a test

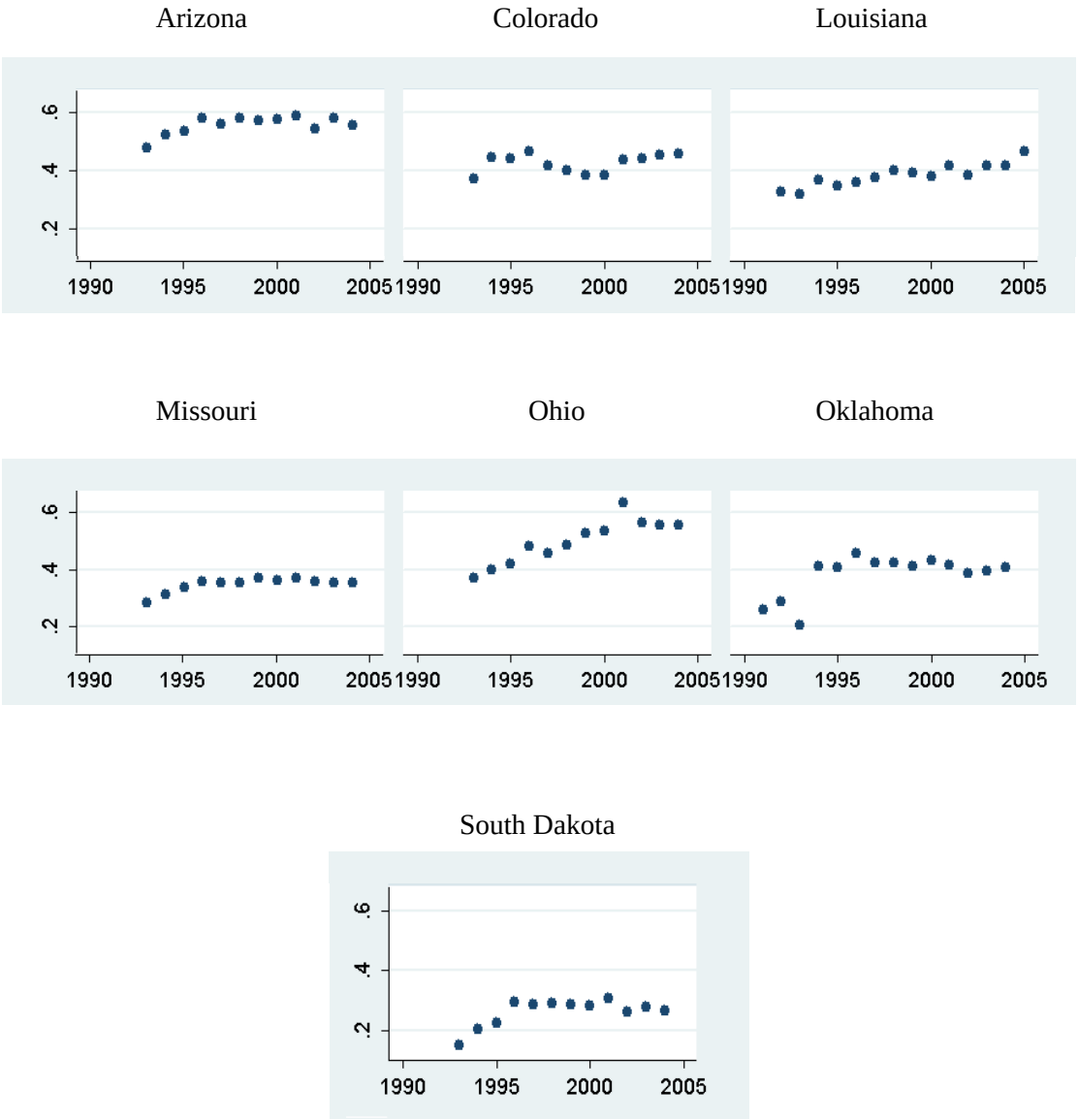
	Dep var: Total transfer per capita
Number of 'term limit' legislators	-0.00
	(0.00)
Population over 65	-0.01**
	(0.00)
School age population	0.01**
	(0.00)
Income per capita	-12.4**
	(1.35)
N	7,405

Regression includes state fixed effects and aggregate year effects

Robust standard errors in parentheses, clustered at state-year level

** significant at 1% level, * significant at 5% level, + significant at 10% level

Figure 1.



State specific differences in the growth rates of transfers
(1984 US$ thousands per capita)