Collective Decisions and Electoral Incentives: Evidence from Seven US State Legislatures*

Toke Aidt† and Julia Shvets‡

University of Cambridge

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Abstract

We study the common pool problem that naturally arises when the allocation of public funds is decided collectively by politicians representing different constituencies. We build a theoretical model of collective decision making to show that electoral incentives induce individual politicians to acquire large transfers for their constituency at the expense of the society as a whole. When faced with a term limit, this incentive disappears and transfers fall. We construct a unique data set on transfers from state budgets to individual legislative districts in seven US states from 1992 to 2005. Legislative term limits allow us to identify the 'last term effect' on transfers from within-legislator variation. We find that legislators bring less money to their district when they stop facing electoral incentives. This provides evidence on the under-explored incentive effect of elections in the context of collective decision making and carries important implications for the welfare effects of legislative term limits.

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

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†Faculty of Economics and Jesus College, Email: tsa23@econ.cam.ac.uk.

‡Faculty of Economics and Christ's College. Email: js591@cam.ac.uk.

1 Introduction

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 politicians (more) into line with the desires of the voters they represent. By threatening not to re-elect incumbents that do not perform, the electorate can keep politicians accountable. This incentive effect of elections have been the subject of intense theoretical study (e.g., Barro, 1973; Ferejohn, 1986; Banks and Sundaram, 1993; Persson and Tabellini, 2000; Maskin and Tirole, 2004; Besley, 2006; Aidt and Magris, 2006).

Existing empirical research on this has explored the prediction 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 a re-election 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 in his last term due to a term limit. Besley and Case show that this change in incentives gives rise to the 'last term effect' in state fiscal policy: governors who can no longer run for a re-election allow taxes to increase and spending to drift up. Focusing on more specific secondary policies, such as environmental regulation, List and Sturm (2006) use gubernatorial term limits in the US to demonstrate that spending on these policies changes when the governor can no longer run for a re-election in a way that is consistent with the widening of the gap between the voter's preferences and politician's choices once re-election incentives are removed.[1]

[1] Another strand of literature uses variation in the quality of media to generate differences in how well-informed the electorate is and hence to demonstrate that politicians 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. Our work is also related to a large literature on political business cycles (see Alesina and Roubini (1997) for a survey). This literature studies whether there exists a distortion in macroeconomic aggregates or in fiscal and monetary policy variables in election years.

The focus of this literature, both theoretical and empirical, has been on how electoral incentives shape unilateral decisions by a single politician. The contribution of this paper is to analyze election incentive effects in the context of politicians making decisions collectively. In reality, fiscal decisions are rarely unilateral. Once we recognize this, both the nature of the incentive effect and its welfare implications may change. We consider fiscal decisions of US state legislatures where each politician represents a his own constituency, each wanting to receive more transfers from the state budget. Hence, a conflict arises between what is desired by the politician's voters and what is optimal for the state as a whole. In the context of this common pool problem, elections acquire a more sinister role than in the situation with a single politician: they create incentives for legislators to pander to parochial interests rather than to optimize the social welfare of the state.

Our analysis has two parts: theoretical and empirical. First we develop a new theoretical framework in which to explore the role of electoral incentives in collective bargaining between legislators. Second, we exploit the institution of legislative term limits in the US to derive testable predictions for how legislators' behaviour changes when electoral incentives are removed. We then analyze empirically state legislators elected to the lower chamber in seven US states and the amounts of money they bring back to the districts in which they are elected. Our empirical analysis differs from the previous studies that use term limits to estimate the impact of electoral incentives in two main ways: we consider legislative rather than gubernatorial limits, and our data describe the flow of state money to different voting districts within a state, rather than aggregate state spending and taxes. These features enable us to test for the impact of incentives on collective decision making.

Thus, we begin by developing a political agency model with asymmetric information in which a number of politicians jointly determine state spending. Collective decision making gives rise to a common pool problem because each constituency wants more spending than what is socially optimal. Politicians come in two types – those who care

about welfare and those who care about their constituency alone. Into this setting, we introduce electoral incentives. We then show that in a pandering equilibrium, even welfare maximizing politicians may choose suboptimal policies due to re-election incentives. This result is in the spirit of Maskin and Tirole (2004). The difference is that in their model the electorate insists on the suboptimal policy because it is 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 alone are forced to support over-spending to reveal themselves to voters.

Introducing term limits into the model gives rise to the following testable prediction: the transfers received by voters in a particular district fall when their representative can no longer run for a re-election.[2] 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 with information on the legislators elected to the lower chamber in the seven states (Arizona, Colorado, Louisiana, Missouri, Ohio, Oklahoma and South Dakota) and on the transfers from the state budget to individual legislative districts. 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 representatives' electoral incentives. We exploit this to analyze what happens to district transfers when the legislator can no longer run for a re-election due to the term limit. Whilst we build on earlier papers that have used gubernatorial term limits to study the effect of electoral incentives, we identify this effect differently. The previous studies estimated the last term effect by comparing a politician in his last term to others who are not. The latter group contains politicians who will never reach the last term. If the voters use elections to select the politicians who will bring their districts more money, then politicians who

[2]This is true in the model with collective decision making even if all the voters have identical preferences. If, however, one assumes that all decisions were made by one politician, this conflict is not there since the electorate is the entire state.

are repeatedly re-elected will differ systematically from those who are not. One may not be able to identify the 'last term effect' separately from selection effect of elections. The richness of our data allow us to address this issue. Within the same state, different legislative districts 'lose' legislators due to term limits in different years. This allows us to identify the 'last term effect' by comparing how the transfer to a particular legislative district changes when its representative 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 contaminate the test.

We find strong evidence that transfers fall when legislators no longer face re-election 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. In this way, legislators who do not face reelection incentives and who, therefore, are free to maximize their own objectives secure lower transfers to their district. This is consistent with the idea that at least some legislators are conscious of the common pool problem, and prefer to spend less than what their voters demand when are not under pressure to be re-elected. A further test shows that the obvious alternative explanation for our main result – that legislators shirk in the last period – is not supported by the data.

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

2 The Model

The purpose of the model is two-fold. First, it serves to organize our thinking about the consequences of first 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 politician, such as a governor or a head of state (see, e.g., Besley and Case, 1995) rather than on collective decision making. Yet, the common pool problem of collective decision making makes an important difference to the effect of elections and term limits.

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 election districts after the introduction of term limits but also in the welfare effects of 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 individuals are more socially-minded than this and have an intrinsic interest in doing what is socially right (see, e.g., Besley, 2006). A central aspect of the model, then, is whether elections with or without term limits can be used as a selection device that allows the majority of voters, 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 term limits magnify or alleviate the underlying common pool problem.

2.1 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 has 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. The district maximizers of district k are only concerned with their own welfare, 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. $v(.)$ 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[3]

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

We assume that $\tau \leq y$ and that there is a cap on district spending set at $p_k \leq y$.[4] The information structure and timing of events are 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 level 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 the majority of voters in the district gets elected for the second period.

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 collective decisions, one for each type of legislator, where the

[3]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 an important role.

[4]This is assumption can be relaxed but it simplifies the presentation of certain non-essential features of the political equilibrium and is made for clarity.

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 selects an optimal spending level given the reelection rule in his district and the spending levels 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 in the seat is larger than the expected utility of electing a randomly chosen challenger. In case of indifference between reelecting or not, we assume that voters reelect, as in Maskin and Tirole (2004). 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.

2.2 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 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

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

The underlying common pool problem has clearly appeared. District maximizers want to spend more than welfare maximizers ($p^{DM} > p^{WM}$) because they do not internalize the full tax cost of spending that goes to their district. 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 level for each legislator does not depend on the choices made by the others (and hence on the composition of the legislature), the realized utility level does. For legislators of type WM this is so because they care about 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 want to compare two economies: one in which there are no term limit (i.e., legislators can be reelected at the end of period 1) and one in which there is a term limit (i.e., all or some of the legislators are forced to step down after the first period). 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.

2.3 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 second period configurations of the legislature. Consider a particular legislator, indexed k. It is useful to decompose the expected payoff of this legislator into the part that comes from the consequences of the fiscal choices made by the legislature for 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 second period payoff for legislator k if his own type is T and if the rest of the legislature happens to be of configuration σ' excluding the contribution to utility that comes from the consequences of the fiscal choices in district k. Each configuration σ' arises with a certain probability depending on δ. For the incumbent of district k, his expected period 2 payoff depends on his type T, on the realized composition of the legislature in period 2, and on whether or not he is reelected ρ. We can write the expected expected utility as

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

where

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

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

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

if he is reelected to implement p^T. $I_{WM} = 1$ and $I_{DM} = N$ and $E_{\sigma'}\left[v_k(\sigma', T)\right]$ represents expected utility from the fiscal choices of 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 policy and separating equilibria in which the two types adopt different spending policies. 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:

$$\begin{aligned} v\left(p^{DM}\right) - p^{DM} &= (1-\beta\delta)\left(v(p^{WM}) - p^{WM}\right) + \\ &\quad \beta\delta(v(p^{DM}) - p^{DM}) - \beta M_1. \end{aligned} \tag{6}$$

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 in order to get reelected. Incumbents of type DM will, therefore, have to "over-spend" a lot to convince voters that they are really district maximizers. The second threshold, M_2, controls if it possible for incumbents of type DM to do so without having to spend more than y and is defined by the solution to[5]

$$\begin{aligned} v(y) - y &= (1-\beta\delta)\left(v(p^{WM}) - p^{WM}\right) + \\ &\quad \beta\delta(v(p^{DM}) - p^{DM}) - \beta M_2. \end{aligned} \tag{7}$$

Clearly, $M_2 > M_1 > 0$. We expand on the intuition behind (6) and (7) in the next section.

2.3.1 Pooling equilibrium

We begin by studying pooling equilibria, i.e., equilibria in which the two types select the same spending policy and voters learn nothing from observing what the incumbent of their district does in period 1.

Proposition 1 *(Pooling Equilibrium) Suppose that*

$$M > M_1. \tag{8}$$

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 the incumbent if and only if $p_k = p^{DM}$.*
3. *The voters' posterior belief that the incumbent of his 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}.*

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

5. *If the voters observe an out-of-equilibrium action, he believes that the legislator is of type WM with probability* 1.

Proof. The second period strategies 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 the WM-type incumbent in district k seeks reelection, his payoff will be

$$\begin{aligned} & y + v(p_k^{DM}) - p_k^{DM} + \sum_{j \neq k} \left(y + v\left(p_j^*\right)\right) - \sum_{j \neq k} p_j^* + M \\ & + \beta \left[M + u_k\left(WM, 1\right) + E_{\sigma'} \left[v_k(\sigma', WM) | \, p^*_{-k} \right] \right]. \end{aligned} \tag{9}$$

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

$$\begin{aligned} & y + v(p_k^{WM}) - p_k^{WM} + \sum_{j \neq k} \left(y + v\left(p_j^*\right)\right) - \sum_{j \neq k} p_j^* + M \\ & + \beta \left[u_k\left(WM, 0\right) + E_{\sigma'} \left[v_k(\sigma', WM) | \, p^*_{-k} \right] \right]. \end{aligned} \tag{10}$$

Comparing and rearranging these two equations give

$$\begin{aligned} v\left(p^{DM}\right) - p^{DM} \quad \geq \quad & (1 - \beta\delta)\left(v(p^{WM}) - p^{WM}\right) + \\ & \beta\delta(v(p^{DM}) - p^{DM}) - \beta M \end{aligned} \tag{11}$$

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 favour of the incumbent ■

We can interpret the pooling equilibrium as a pandering equilibrium. Legislators of all types pander to the wishes of the electorate in their district, and those of type WM do

this despite their innate desire to chose what's in the best interest of the electorate in the state at large. 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 and the equilibrium is not unintuitive in the sense 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.[6] The reasons is that there would 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.

2.3.2 Separating Equilibria

The economy without term limits has two types of separating equilibria in which the type of incumbent is revealed in the first period and only incumbents of type DM are reelected. In one type of equilibrium, which we call the *screening equilibrium*, voters are effectively able to screen legislators in the first period and get them to reveal their type by implementing their type-specific optimal policy. In the other type of equilibrium, which we call the *signaling equilibrium*, incumbents of type DM distorts their fiscal choice upwards to signal their commitment to the district and are rewarded for doing so by reelection. We begin by characterizing signalling equilibria. In general, there exist many of these, but if we can reduce the set to a singleton by imposing some mild

[6] The intuitive criterion says: if there is some type of politician who has a deviation that is assured of yielding a payoff above the equilibrium payoff as long as voters do not assign a positive probability this deviation being made by a type of politician for whom the deviation is equilibrium dominated, then we eliminate the PBE as being unintuitive.

restrictions on the out-of-equilibrium beliefs of voters (see below). We refer to this unique equilibrium as the undominated separating equilibrium.

Proposition 2 *(Signalling equilibrium) Suppose that*

$$M_2 > M > M_1.$$

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

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

for $\widehat{p}_k > p^{DM}$*. Then a unique undominated separating equilibrium in pure strategies exists. The equilibrium is supported by the following strategies and beliefs:*

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 his district is of type* DM *is* 1 *if they observe* $\widehat{p} \in \left[\widehat{p}^{DM}, \widehat{p}^{WM}\right]$ *and* 0 *if* $\widehat{p} = p^{WM}$ *or any other action outside* $\left[\widehat{p}^{DM}, \widehat{p}^{WM}\right]$ *is observed.* $\widehat{p}^{WM}$ *is defined in equation (18).*

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

Proof. The second period strategies 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 $j \neq k$, by 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

$$\begin{aligned} &y + v(\widehat{p}_k) - \widehat{p}_k + \sum_{j\neq k}\left(y + v\left(p_j^*\right)\right) - \sum_{j\neq k} p_j^* + M \\ &+\beta\left[M + u_k\left(WM, 1\right) + E_{\sigma'}\left[v_k(\sigma', WM)\middle|\, p^*_{-k}\right]\right]. \end{aligned} \tag{13}$$

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

$$\begin{aligned} & y + v(p_k^{WM}) - p_k^{WM} + \sum_{j \neq k} \left(y + v\left(p_j^*\right)\right) - \sum_{j \neq k} p_j^* + M \\ & + \beta \left[u_k \left(WM, 0 \right) + E_{\sigma'} \left[v_k(\sigma', WM) | \, p_{-k}^* \right] \right]. \end{aligned} \tag{14}$$

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

$$\begin{aligned} v(\widehat{p}_k) - \widehat{p}_k \quad \leq \quad & (1 - \beta\delta) \left(v(p_k^{WM}) - p_k^{WM} \right) \\ & + \beta\delta \left(v(p_k^{DM}) - p_k^{DM} \right) - \beta M. \end{aligned} \tag{15}$$

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

$$\begin{aligned} & y + v(\widehat{p}_k) - \frac{\widehat{p}_k}{N} - \frac{\sum_{j \neq k} p_j^*}{N} + M \\ & + \beta \left[M + u_k \left(DM, 1 \right) + E_{\sigma'} \left[v_k(\sigma', DW) | \, p_{-k}^* \right] \right]. \end{aligned} \tag{16}$$

If, on the other hand, he deviates to the short-term optimal policy with the consequence of not getting reelected, he gets

$$\begin{aligned} & y + v(p_k^{DM}) - \frac{p_k^{DM}}{N} - \frac{\sum_{j \neq k} p_j^*}{N} + M \\ & + \beta \left[u_k \left(DM, 0 \right) + E_{\sigma'} \left[v_k(\sigma', DM) | \, p_{-k}^* \right] \right]. \end{aligned} \tag{17}$$

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

$$\begin{aligned} v(\widehat{p}_k) - \widehat{p}_k \quad \geq \quad & (1 - \beta(1-\delta)) \left(v(p_k^{DM}) - p_k^{DM} \right) \\ & + \beta \left(1 - \delta\right) \left(v(p_k^{WM}) - p_k^{WM} \right) - \beta M \\ & + \frac{N-1}{N} \left[\beta \left(1 - \delta\right) p_k^{WM} + (1 - \beta(1-\delta)) p_k^{DM} - \widehat{p}_k \right], \end{aligned} \tag{18}$$

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 (15) and (18), respectively, for $p > p^{DM}$. We can calculate the difference between the

right hand side of equation (18) and equation (15):

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

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 his 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 single point 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 which 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 ■

This equilibrium shows that incumbents of type DM might have to exaggerate their desire to please their constituency 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 arise 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}.*

Proof. The proof is similar to that of Proposition 2 with one major difference. Since condition (18) holds at $\widehat{p}_k = p^{DM}$, incumbents of type DM are trivially willing to play their first period strategy, i.e., p^{DM}. Given that, we can evaluate condition (15) 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 ■

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, this is not the case in the screening equilibrium.

2.4 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 level. 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).[7] 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.

Proposition 4 *If $M > M_1$ then term limits i) on average reduces spending in the period before they become binding and ii) improves social welfare.*

Proof. Consider period 1 only (period 2 is not affected by term limits). First, 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 limit because the configuration of the legislature will on average include a mixture of the two types, some of which with then select $p^{WM} < p^{DM}$. Term limits improve social welfare because they provide incentives for incumbents of type WM to do in their last term what is socially optimal rather than pandering to the voters in their district.

Second, suppose that the economy without term limits is in the undominated separating 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. Moreover, social welfare improves because p^{DM} is closer to p^{WM} than $\widehat{p}^{DM}$ ■

Term limits reduces average spending for two reasons. Firstly, they discourage welfare maximizers from giving in to the temptation to pander to the voters in their district. This alleviates the common pool problem. As a consequence, 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 maximizes. This, again, alleviates the common pool problem and improves social welfare.

[7] We rule out uninutitive pooling equilibria such that the screening equilibrium is the unique outcome for $M \leq M_1$.

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 without term limits. It is clear, however, that a similar conclusion will hold if only a subset becomes term limited after period 1 and/or is we allow some legislators to play the pooling and some to 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.

2.5 Further features

Here we discuss several features that are absent from our model, but might in practice interact with term limits.

2.5.1 Searching

In reality politics is an ongoing process that stretches over many period, not just two. This has implications for the interpretation of the two separating equilibria. Suppose that one of the separating equilibria prevails in the economy without term limits and suppose that "period 1" is considered the end-result of a long search process by which each district kicks WM legislators out after one term. Without term limits, legislators of type DM will on the other hand be reelected again and again – once a district has found one, it will keep him. This means that the "period 1" incumbent will mostly be of type DM and would (mostly) be reelected for period 2 in the absence of term limits. With term limits this is no longer possible and the legislator elected for period 2 will be a random draw from the population. This has a testable implication. If we compare legislators who served to the term limit to those elected in the same district which did not, we should expect to see higher average transfers during the tenure of the former group. This is because the later group must include a lot of welfare maximizers who revealed themselves to voters by delivering small transfers to the district.

2.5.2 Parties

Parties play an important role in US politics, and the differences between democrats and republicans are often seen as more important than differences between individuals within the same party. Hence, one may expect the behavior of individual legislators to be influenced by their party affiliation. If a party's objective is the welfare of all districts that vote for it, then the party will reduce the common pool problem described in section 2.2. Hence, the policy chosen by the party p^Pwill satisfy $p^{WM} < p^P < p^{DM}$. Whether the individual legislator will toe the party line will depend 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 the last period 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.

One way of incorporating this into our model is to allow legislator specific characteristics such as ego rents and discount factors to be affected by the party affiliation. 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 will be in a signalling or pooling equilibrium) and districts where the incumbent is from party R (they will be in the screening equilibrium). In this example, term limits will not have an impact in districts controlled by party R but it would lead to a reduction of spending on average in districts controlled by part L.

2.5.3 Discretion

Our model assumes that legislators wholly determine the before-tax amount of money that is allocated to their district. In reality, this is unlikely to be the case. Particularly,

some state transfers are predetermined by characteristics of the voters or the district. Examples include welfare transfers such as unemployment and disability benefits, and to a lesser extent, transfers to utility providers and transfers to school districts calculated using a formula based on enrollment. We group such transfers together and denote them as 'non-discretionary'. We expect the predictions of our model to be more relevant for discretionary than for non-discretionary transfers.

2.5.4 Experience

Legislators may become more effective at bringing transfers to their districts over time. Hence, the amount of transfer may rise with the number of years that the legislator stays in office. Focusing on comparison of the last period with the earlier periods, such experience effect will work in the opposite direction of the incentive effect observed in the last term of the pooling or signalling equilibrium.

3 Data

We have constructed a new data set for seven US state houses of representatives that have recently introduced legislative term limits (Arizona, Colorado, Louisiana, Missouri, Ohio, Oklahoma and South Dakota) covering the period from 1992 to 2005.[8] The states in the sample represent three out of four regions of the US: Midwest, South and West, and contain 12% of the US population.

The data set contains information on transfers from the state budget to individual legislative districts, information about legislators, and information about term limit policies in each state. The unit of observation is a legislator in a particular legislative district in a particular state and year.

[8] Of the fifteen states that currently have legislative term limits, the remaining eight did not make it into 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).

The US Census Bureau does not disaggregate state accounts by legislative districts. 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[9] to extract data on transfers from the state budget received by these local service providers in a given year.[10] We then match these local service providers to the legislative district or districts in which they are located. The outcome of this procedure is an estimate of the size of the transfer from the state budget that goes to a particular legislative district. About 23 percent of the states' total budget can be attributed in this way, but, as we discuss below, with a large variance across different spending categories.[11] The rest of the state budgets 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 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 goods.

To match the monies received by local service providers to particular legislative districts, we made use of the US Census Bureau Topologically Integrated Geographic Encoding and Referencing System (TIGER).[12] On the one hand, TIGER provides data on the geographical boundaries of local government units and school districts. On the other hand, it also provides data on the boundaries of state legislative districts. We matched the two sets of boundaries using custom-written software.[13] Smaller local

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

[10] These data are available from Census Bureau, see US Census Bureau's Annual Survey of Governments and Quarterly Census of Governments, http://www.census.gov/govs/.

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

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

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

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 geographical area 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 assumes 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 a legislator is serving his or her last term as allowed under the state's term limits rules.

The data on state transfers to local service providers has been previously used to analyze state party politics in Ansolabehere and Snyder (2006). In contrast to this study, it uses county data only (which leaves educational spending, the largest of transfers, un-examined), and does not attempt to allocate transfers to the individual legislative districts.

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 a large variation within states across legislative districts.[14]

[14]Note that our geographical matching method must overstate this variation relative to its true

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

The extent to which a legislator can influence the size of the transfer that his district's local service providers receive depends on the type of spending. Some types, 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. To take such differences into account, we group the transfers into two categories. The first category includes transfers that are likely to be outside the legislator's 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).[15] The second category includes transfers that the legislator is likely to have some 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>

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 local service providers (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 a particular legislative district. 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

(though unobserved) value.

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

lot of variation in transfers within each type. This variation comes from three sources: across states, across districts and across time. This variation is highest for discretionary transfers, with the coefficient of variation for this type of transfers being two times as large as for non-discretionary transfers.

The real value of the transfer, 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. This, however, masks an important fact: the growth rate of transfers differed substantially across states. This is shown in Figure 1. Our data set is an unbalanced panel and different states have different numbers of legislators who are in their last term. Combined with the large state-specific differences in the growth of state transfers, there is a risk that our estimate of the 'last term effect' could be biased of these differences are ignored. To address this (potential) problem, we must account for state-wide changes over time, specific to each state, in our estimations.

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

For each of the seven state House of Representatives (state lower houses), our data set contains detailed information about all the state legislators who served during the sample period. In particular, 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 1,670 legislators, representing approximately 640 districts. The length of service varies from 1 year to 35 years, with an average of 9.3 years. The legislators in the sample are equally split between republicans and democrats.[16] Table 3 provides a detailed breakdown of the legislators by state.

<Table 3: State representatives, by state.>

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

Finally, the data set contains information on the legislative term limits in each of the seven states.[17] During the 1990ies legislative term limits were introduced in twenty one US states.[18] Table 4 shows when the legislative term limits were adopted in the seven states in the sample. Using this information, we calculated when 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 term limit. There are 328 legislators like that in our data set.

The fact that the term limits were introduced during the sample period might raise concerns that decisions on term limits and budget allocation were driven by the same unobserved factors. We observe, however, that with one exception the existence of a citizen's initiative has been both the necessary and the sufficient condition for introduction of term limits. On the one hand, all states that have this institution have now experimented with term limits, originally adopting them through referenda. On the other hand, among the states that do not allow citizens' initiative, only one - Louisiana - has introduced term limits. Provisions for citizens' initiatives exist in twenty four US states and is a century-old institution that allows citizens to put proposals on the ballot. Whilst these initiatives might be correlated with state-wide political and economic conditions, but they are unlikely to be correlated with conditions in particular legislative districts. Moreover, the term limits become binding for different legislators at different times in the same state house. For those reasons, we are confident that term limits generate exogenous variation in when particular legislators must step down and that is what we need for our test.

[Table 4: Legislative term limits]

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

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

4 Evidence on the 'last term effect'

The main testable prediction of the model is summarized by Proposition 4(i). In plain words it says that, given that legislators care enough about holding office, a district should, on average, receive fewer transfers when their representative serves his or her last term allowed under the state's term limits rules than otherwise. This is so for two reasons. First, in the pooling equilibrium, welfare maximizers have no reason to pretend to be district maximizers and so they reduce spending in the last term. Second, in the signalling equilibrium, district maximizers have no reason to over-spend in the last term. In either case, transfers should, on average, fall in the last term. If, on the other hand, the ego-rent and other benefits from holding office are low and the screening equilibrium prevails, then there should be no difference between the last term and any other term that a legislator serves. Given that, the data reject the model only if we observe an *increase* in spending in the last term. We can summarize this as

Prediction 5 *(The 'last term effect') The amount of transfers allocated to a district is (weakly) smaller when the legislator representing that district is in the last term compared to when he or she is not.*

To examine this prediction, we estimate the following equation

$$y_{ijt} = \gamma(last\ term)_{ijt} + \boldsymbol{\alpha}'\mathbf{x}_{ijt} + \varepsilon_{ijt}, \tag{19}$$

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 theoretical model assumes that all districts are the same. In reality, this is not the case – for example, demographic and economic characteristics of voters will differ

across districts and this may cause them to prefer different levels of spending. Moreover, these characteristics may be correlated with the nature of politics in the district and may affect the probability that a legislator survives to the term limit. Hence, it may be difficult to get an unbiased estimate of the 'last term effect' if variation across districts is exploited. Given that our data are quite rich, we could address this problem by introducing district fixed effect into our empirical specification. If we did so, the 'last term effect' would be identified by comparing legislators who are in their last term with legislators who are not, within in the *same* district.

Yet, even with district fixed effects the estimate of γ may be biased. This is due to selection effects that are present when comparing a legislator who served till the end of the allowed limit to a legislators who was voted out (or stepped down) earlier, even if the comparison is within the same district. This can be illustrated within our theoretical framework. Suppose that our model is the true data generating process and recall that prediction 5 requires that the ego-rent is sufficiently large. Since we cannot directly observed the ego-rent of each legislator, we pool all districts and all legislators together, and look for patterns in the average district. Some districts may be in a pooling or signaling equilibrium while others, where the legislator has a low ego-rent, may be playing the screening equilibrium. As discussed in section 2.5.1, in districts that play the screening equilibrium, the average transfer secured by the legislators who survive till the last term is higher than that of the rest. Similarly, in the signalling equilibrium. Therefore, in districts where the screening or the signaling equilibrium is played, we would expect a positive γ since only legislators that deliver high transfers ever survive to the last period. At the same time, in districts with a pooling equilibrium we would expect to see a negative γ. The net effect may not be significantly different from zero or even positive, preventing us from identifying the incentive effect of the last period separately from the selection effect of elections.

We address this issue by estimating the model in (19) with legislator fixed effects. By doing so, the last term is only compared to the earlier terms of the *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 separating equilibrium, γ may also be negative because once district maximizers have signaled their type early on by over-spending, they can get reelected to the end of the term by implementing a transfer policy close to the district maximizing one. Although there still must be a critical mass of 'pooling' or 'signalling' legislators for us to identify the 'last term effect', it is no longer contaminated by the possible selection effects.

The raw data show that transfers rise over time in all states during our sample period (see Figure 1). Since term limits start to bind in the second half of our sample (from 1998 onwards), there is a positive correlation between a legislators being in their last term and the size of the average district transfer. To make sure this does not bias our estimate of the 'last term effect', we could introduce year fixed effects. These would rule out that we confuse common shocks that affect the macroeconomy or national politics with the decisions made by legislators serving their last term. Yet, aggregate year fixed effects do not capture very different patterns of growth across states. In order to take these into account, we control for state-specific year fixed effects.

To summarize, the last term effect is identified by looking at whether the difference between the amount a particular legislator brings to his district and the amount received by the average district in that state that year changes significantly when this legislators moves into his last term.

We report three sets of results. The first set relates to total transfers to legislative districts; the second set decomposes transfers into those which are discretionary and those which are not; and the last set of results focuses on education spending in isolation.

4.1 Results for Total Transfers

The results for total transfers per capita are reported in table 5. We find that the 'last term effect' is negative and significant at the five percent level (column 1). 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 is consistent with prediction 5 and hence with the idea that (some) legislators are conscious of the common pool problem, and prefer to spend less than what their voters demand. We note that we identify the negative 'last term effect' despite potential experience effects which, as discussed in section 2.5.4, would work in the opposite direction, attenuating the estimate.

[Table 5: Test of the 'last term effect': Total transfers per capita.]

As argued in section 2.5.2, party affiliation may be correlated with unobserved characteristics of individual legislators such as the size of the ego-rent and their discount factor. As a consequence, legislators from different parties could be playing systematically different equilibria. 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 the specification reported in column 2 of table 5: one dummy variable for whether the legislator is a democrat or not (*Democrat*)[19] and two dummy variables that are equal to one if a democrat or a republican, respectively, is in his or her last term (*Democrat (Republican) in the last term*). We see that the 'last term effect' is only significant among democrats who bring about $17 per capita less back to their district when they serve their last term. 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

[19]Since politician fixed effects are included, the direct effect of the party on average district transfer (the coefficient on the *Democrat* variable) is identified from politicians that change their party while in office. There are very few such cases, and, unsurprisingly, the coefficient on this variable is insignificant

equilibrium) 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[20].

The regressions reported in columns 1 and 2 of table 5 include state-specific year fixed effects. An F-test strongly rejects the hypothesis that year fixed effects are the same across all states. Without state-specific year fixed effects, the effect of the last term is not identified (columns 3 and 4).[21]

4.2 Discretionary and Non-discretionary Transfers

In table 6, we report the results for discretionary and non-discretionary transfers separately. Discretionary transfers fall in a legislator's last term (columns 1 and 2). The 'last term effect' is significant at the five percent level in the regression in which legislators from the two main parties are pooled together (column 1). When we allow the 'last term effect' to vary with party affiliation, we see, again, that the effect is present only among democrats (column 2). Now the estimate implies that transfer falls by about $13 per capita in a democrat's last term. In contrast, the transfers over which individual legislators have little or no discretion exhibit no 'last term effect' (columns 3 and 4). This is as expected and lends further credence to the claim that we have, in fact, identified a 'last term effect'.

[Table 6. Test of the 'last term effect': Discretionary and non-discretionary transfers per capita]

[20] Some districts are represented by more than one legislator. We matched each legislator with the total transfer to the districts, and allowed for clustering at district-year level when estimating all standard errors.

[21] These regressions include a number of controls for state-specific events that may be correlated with the timing of the last term. If these are omitted, the coefficient on last term still remains insignificant. The controls are: a dummy variable equal to one if the majority in the legislator is democratic (*Democrat majority*), a dummy variable equal to one in election years (*Election year*) and a dummy variable for the new legislative district borders after 2000 Census (*Post 2000 Census districts*). These variables are perfectly colinear with state specific year effects.

4.3 Education Transfers

Transfers for primary and secondary education are the largest component of total transfers. It is, therefore, of special interest to look for 'last term effects' for this sub-category, distinguishing between formula transfers and more discretionary, non-formula transfers. The results are reported in table 7

[Table 7. Test of the 'last term effect': Formula and discretionary education transfers per capita.]

Consistent with our previous findings, we see a drop in total education transfers in the last term, and this effect is significantly stronger among democrats than among republicans (columns 1 and 2). If we focus on discretionary transfers, the magnitude of the effect is about $9 per capita for democrats in their last term and zero for republicans (column 4). The result for formula-based transfers is more surprising. Here, we find a 'last term effect' among both parties, though it is smaller, less significant and, as we shall see in the next section, less robust that the effect on discretionary educational transfers (columns 5 and 6).

4.4 Further robustness test

The amount of transfers that districts receive are likely to depend on district characteristics, as well as on the behaviour of the district's representative. By including the politician fixed effect into our regressions, we have ensured that the comparison is between earlier and later terms of the same politician, and that district characteristics that are fixed over time are not contributing to our identification.[22] Yet it is possible that districts to evolve over time. Omitting district characteristics that change over time and affect transfers may bias our estimate of γ if the change in these characteristics is correlated with the timing of the legislator's last term.

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

Having said this, 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 come up with the intuition that would generate such a relationship. Nevertheless, to address this potential concern we control for the following potential determinants of transfers: population over 65, school-age population and income per capita. These data are not available at district level, and so we constructed estimates from county data with the same geographical overlap technique we used to construct transfers. The results of our estimation are reported in table 8.

[Table 8. Further robustness test with time-varying controls]

The effect of the last term on total spending is no longer identified (column 1). But when we break down the data by type of transfer and party, we continue to find a significant fall in education transfers delivered by democrats in their last term in office (column 2). This result is driven by discretionary rather than formula spending (columns 4 and 5). The controls are mostly significant, with more school aged children and lower income areas attracting higher transfers.

4.5 Pooling or Separating?

The theory developed in section 2 delivers a number of additional predictions. These predictions are testable and can help us understand whether the 'last term effect' observed in the data is generated by welfare maximizers pretending to be district maximizers (pooling equilibrium) or by district maximizers who are trying to reveal themselves to voters by over-spending (signaling equilibrium).

The first of these tests looks at the average size of the transfer delivered by legislators who get re-elected and the average size of the transfer delivered by legislators who do not. In a pooling equilibrium, this different is approximately zero. This is because the mixture of types is the same amongst those who are re-elected and those who are

not.[23] 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 9 shows the results of two estimations designed to test this prediction.[24] Neither regression can be interpreted as causal, but the coefficients should tells us whether the relationship predicted by the separating equilibrium is present. The first estimation asks whether there is a relationship between the final length of a politician's service and the total transfer received by a district. The answer, shown in column one, is that no such relationship can be identified, and the same message comes through when we disaggregate the fiscal data and include controls for district characteristics [not reported].[25] 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 delivered by the rest. Again, we find no difference (column two). This is inconsistent with the separating equilibrium and thus points in the direction of a pooling equilibrium.

[Table 9. The Difference in average transfers and length of service]

4.6 Alternative Explanations

We view the negative 'last term effect' as evidence of a common pool problem that naturally arises arising when (some) legislators fail to internalize the effect of their actions on voters in other districts than their own. However, there is an (obvious)

[23] Strictly speaking, in the model all legislators get re-elected 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 period.

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

[25] This is true for all legislators who were elected after the term limits were introduced. If we include legislators elected before the introduction of term limits (some of whom stayed in the office for over 30 years), we do find a positive relationship between the length of total service and formula-based education transfers.

alternative interpretation of the finding which we shall refer to as the *effort model*: it could be due the 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 both as pooling equilibria and separating equilibria. In the former, 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 later, 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. Appendix contains a sketch of the effort model.

The central feature of the effort model in 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. Such competition for tax payers' money underlies the assumption of costly effort in political agency models. 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. In particular, since legislators who are up against the term limit have an incentive to exert less effort, it matters how many legislators in other districts face a term limit. To see this more clearly, consider a particular district, call it A, and suppose that most other legislators are not facing a term limit. In this case, they exert a lot of effort to secure transfers to their districts and it is hard for the legislator of district A to secure a large transfer. Contrast this with a situation in which most of the other legislators are term limited. In this case, it is relatively easy for the legislator of district A to secure a large transfer simply because the others do not exert much effort. In other words, the effort model predicts that the transfer that a particular district gets depends positively on how many of the legislators

in other districts are facing 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 2, the transfers secured for a given district are independent of whether the 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 can use this observation to discriminate between the two models.

[Table 10: Test of district interdependence]

In table 10, we present the result of an estimation where we test if 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 with the legislators who are not in their last term (the results do not change if we take all districts instead). 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].

5 Conclusion

A large body of theory in political economics is predicated on the assumption that electoral incentives matter for the behaviour of politicians and that election among other functions serve as implicit incentive contracts. This paper adds new empirical evidence in support of this assumption. We explore the variation in electoral incentives generated by exogenous term limits on how long legislators are allowed to serve, but we do this in the context of collective decision making. Exploring a rich new data set on state spending by legislative district in seven US states which enforce term limits on how

long individual legislators can serve in the state legislature, we find strong evidence of a negative 'last term effect'. The magnitude of the effect is about 4 percent of total per capita transfers from the state budget. We interpret this as evidence that 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.

References

Aidt, T.S., and Magris, F., 2006. Capital taxation and electoral accountability. European Journal of Political Economy 22(2), 277-291.

Alesina, A., and Spear, S., 1988. An overlapping generations model of electoral competition. Journal of Public Economics 37, 359-79.

Alesina, A. and Roubini, N. with Cohen G.D. 1997. Political Cycles and the Macroeconomy. Cambridge, Mass.: MIT Press.

Ansolabehere, S., and Snyder, J., 2006. Party Control of State Government and the Distribution of Public Expenditures. Scandinavian Journal of Economics 108(4), 547–569.

Banks, J., and Sundaram, R.K., 1993. Adverse selection and moral hazard in a repeated election model. In: W. Barnett et al. (eds.), Political economy, institutions, information, competition and representation. Cambridge, UK: Cambridge University Press.

Barro, R.J., 1973. The control of politicians: an economic model. Public Choice 14, 19-42.

Besley, T. 2006. Principled Agents. Oxford: Oxford University Press.

Besley, T. and Case, A., 1995. Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits, Quarterly Journal of Economics 110 (3), 769-798.

Besley, T., and Burgess, R., 2002. The Political Economy of Government Responsiveness: Theory and Evidence from India. Quarterly Journal of Economics 117(4), 1415-1451.

Carsey, T.M., Berry, W.D., Niemi, R.G., Powell, L.W. and Snyder, J.M. 2008. 'State Legislative Election Returns, 1967-2003', Inter-university Consortium for Political and Social Research, Ann Arbor, MI.

Cho, I.K. and Kreps, D.M., 1987. Signaling games and stable equilibria. Quarterly Journal of Economics 102(2), 179-221.

Ferejohn, J., 1986. Incumbent performance and electoral control. Public Choice 50(1-3), 5-25.

List, J.A. and Sturm, D.M., 2006. Elections matter: Theory and evidence from environmental policy. Quarterly Journal of Economics 121(4), 1249-1281.

Maskin, E; Tirole, J., 2004. The politician and the judge: Accountability in government. American Economic Review 94(4), 1034-1054.

Persson, T., and Tabellini, G., 2000. Political Economics. Explaining Economic Policy, Cambridge, Mass.: MIT Press.

Appendix: The Effort Model

- Two periods, discounting at β, two districts only, $k = 1, 2$. One voter in each district.
- Fixed budget R. The voter of district k has the following utility function

$$v_k = s_k R$$

  where s_k is the share of the budget that is transferred to district k with $\sum s_k = 1$.
- The legislators have to invest effort e_k to get transfers to their district. Assume a Tullock contest function:

$$s_k = \frac{e_k}{\sum e_j}.$$

- Legislators get the ego rent M if in office and incur private cost of effort $c_T(e_k)$ where T denote type. They do not care about the transfers per se.
- There are two types of legislators, high cost and low cost. To make the analysis tractable, we model the cost functions in the following way:

$$c_L(e_k) = \begin{cases} 0 & \text{for} \quad e_k \in [0, \overline{e}] \\ \infty & \text{for} \quad e_k > \overline{e} \end{cases}$$

  and

$$c_H(e_k) = \begin{cases} 0 & \text{for} \quad e_k \in [0, \underline{e}] \\ c & \text{for} \quad e_k \in (\underline{e}, \overline{e}] \\ \infty & \text{for} \quad e_k > \overline{e} \end{cases}$$

  where $c > 0$ and $\underline{e} < \overline{e}$ and $\underline{e} + \overline{e} = 1$. Notice that this function is convex. [The trick is that politicians even if they don't care about transfers per se are willing to put in some effort (at zero cost), but how much depends on their type. This formulation avoids a lot of mess in specifying what happens after the election. It also implies that we can circumvent the issue of whether the politician know the type of its opponent in the contest.]
- The share of type L is δ. The share of type H is then $1 - \delta$. Type is private knowledge.
- Second period: no election incentives, so type H sets $e_k = \underline{e}$ and type L sets $e_k = \overline{e}$. It is clearly better for the voter in district k irrespective of what the type of the politician in the other district may be to be represented by a type L legislator.
- First period. Voters only observe the transfer not the effort of their legislator. The following is a pooling equilibrium for $\delta\beta M > c$.
  - Voters reelect if the observe a transfer that is equal to or larger than $\frac{1}{2}R$.

- All politicians set $e_k = \overline{e}$.
- Voters posterior believe that the incumbent is of type L is δ.

- A politician of type L will always set $e_k = \overline{e}$ and get payoff βM. Consider a politician of type H in district k. He does not know the type of the politician in the other district. If he goes for reelection and invests $e_k = \overline{e}$ the transfer to district k will be $\frac{1}{2}R$ if the other legislator also set $e_{-k} = \overline{e}$ and $\overline{e}R$ if he sets $e_{-k} = \underline{e}$. In either case he get reelected and gets

$$-c + \beta M.$$

Alternatively, he can set $e_k = \underline{e}$. Then he only gets reelected if $e_{-k} = \underline{e}$. The payoff is:

$$(1 - \delta)\, \rho_{-k}()\beta M.$$

where $\rho_{-k}()$ is the equilibrium probability that incumbent in district $-k$ plays $e_k = \underline{e}$. So he mimics if $-c + \beta M > (1 - \delta)\, \rho_{-k}()\beta M$. Voters don't learn anything and if all districts play pooling then $\rho_{-k}()$ and voters in k get $\frac{1}{2}R$ in period 1. [What if they ask for $\overline{e}R$ to reelect? Politician that sets $e_k = \overline{e}$ gets

$$-c + (1 - \delta)\, \rho_{-k}()\beta M$$

and if he sets $e_k = \underline{e}$ he gets 0. Never comply, so cannot be pooling equilibrium].

- Without term limits all districts get $\frac{1}{2}R$ in period 1. With term limits. The district which is term limited will see an average fall in its transfer because type H will reduce its effort to $\underline{e}$ while the other district will keep the effort high. Conversely, spending in the district which is not term limited goes up from $\frac{1}{2}R$ to $\overline{e}R$ it the other district is term limited relative to when it is not (and the incumbent is of type H in the term limited district).

- The prediction then is that positive effect of district spending when legislators in other district face term limit.

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 (separate data for formula spending and pre-1995 data on total education spending are not available)

Table 3. State representatives, by state

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 (TL)

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

Table 5. Test of the 'last term effect': Total transfers per capita

	(1)	(2)	(3)	(4)
Last term	-0.014*		0.008	
	(0.007)		(0.007)	
Democrat in the last term		-0.017*		0.006
		(0.008)		(0.008)
Republican in the last term		-0.012		0.010
		(0.008)		(0.007)
Democrat		0.007		0.016
		(0.015)		(0.020)
Democrat majority			-0.022**	-0.022**
			(0.007)	(0.007)
Post 2000 Census districts			-0.046**	-0.046**
			(0.015)	(0.015)
Election year			-0.000	-0.001
			(0.003)	(0.003)
N	8,660	8,660	8,658	8,658
Year fixed effects	State-specific	State-specific	Aggregate	Aggregate

All regressions include politician fixed effect

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': Discretionary and non-discretionary transfers per capita

	(1) Discretionary	(2) Discretionary	(3) Non-discretionary	(4) Non-discretionary
Last term	-0.009*		-0.005	
	(0.004)		(0.004)	
Democrat in the last term		-0.013*		-0.004
		(0.005)		(0.005)
Republican in the last term		-0.006		-0.006
		(0.004)		(0.005)
Democrat		-0.000		0.008
		(0.007)		(0.012)
N	8,660	8,660	8,658	8,658

All regressions include politician fixed effect and state-specific year effect

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

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

Table 7. Test of the 'last term effect': Education transfers per capita

	(1) Total	(2) Total	(3) Discretionary	(4) Discretionary	(5) Formula	(6) Formula
Last term	-0.010*		-0.003+		-0.007*	
	(0.004)		(0.002)		(0.003)	
Democrat in the last term		-0.016**		-0.009**		-0.006
		(0.006)		(0.002)		(0.005)
Republican in the last term		-0.005		0.002		-0.007+
		(0.005)		(0.002)		(0.004)
Democrat		-0.001		-0.005		0.004
		(0.014)		(0.004)		(0.011)
N	8,660	8,660	8,660	8,660	8,658	8,660

All regressions include politician fixed effect and state-specific year effect

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

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

Table 8. Robustenss test with time varying district characteristics

	(1) Total	(2) Education - total	(3) Education - total	(4) Education - discretionary	(5) Education - formula
Last term	-0.002	-0.006			
	(0.006)	(0.004)			
Democrat in the last term			-0.012*	-0.009**	-0.002
			(0.005)	(0.002)	(0.008)
Republican in the last term			-0.001	0.003	-0.010
			(0.004)	(0.002)	(0.006)
Democrat			-0.006	-0.008*	-0.005
			(0.015)	(0.004)	(0.022)
School age population	0.006**	0.002**	0.002**	0.000**	0.003**
	(0.002)	(0.000)	(0.000)	(0.000)	(0.001)
Income per capita	-4.58+	-5.19*	-5.20*	-1.38**	-9.80**
	(2.43)	(2.24)	(2.24)	(0.47)	(3.66)
Population over 65	0.004				
	(0.003)				
N	8,061	8,061	8,061	8,061	8,061

All controls are lagged one year

All regressions include politician fixed effect and state-specific year effect

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

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

Table 9. Transfers per politician and length of service

	(1)	(2)
	Dep var: Total transfer	
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 politician level

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

Table 10. Test of district independence

	Dep var: Total transfer
Number of politicians that face term limit	-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. Average transfer to legislative district from state budget
(1984 US$ thousands per capita)