

# Online data appendix for “Distributive Politics and Electoral Incentives: Evidence from Seven US State Legislatures”

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This appendix provides a detailed description of how we constructed the dataset from a number of sources. To estimate the amount of funding secured by each representative for his district, we begin with data on transfers from state budgets to local government units. We then match the local government units to legislative districts and the representatives who serve them. Using historical data on elections and state term limit laws, we, finally, determine the term after which each representative can no longer run for re-election.

The appendix follows this outline:

1. List of data sources
2. Transfers
3. Legislators
4. From local government units to geographical divisions
5. From geographical divisions to legislative districts and their representatives
6. States without term limits

## *1. List of data sources*

- 1) Transfers from the state budget to local government units.
  - a) Counties, municipalities, and special districts: US Census Bureau, State and Local Government Finances (SLGF), Individual Unit Files, 1992–2006 (<http://www.census.gov/govs/estimate/>).
  - b) School districts: US Census Bureau, Public Elementary-Secondary Education Finance Data (PESEF), 1992–2006 (<http://www.census.gov/govs/school/>).
- 2) Legislators: The State Elections Database (Carsey et al. 2008) supplemented by state legislative rosters, election records and almanacs of US state governments (either available on-line or received by approaching the relevant state legislatures).
- 3) Term limits: National Conference of State Legislatures (2009) “The Term Limited States.” (<http://www.ncsl.org/>).
- 4) Geographical coverage of local government units:
  - a) Counties and municipalities: US Census Bureau, State and Local Government Finances (SLGF), Directory Information Files, 1992–2006

(<http://www.census.gov/govs/estimate/>) and US Census Bureau, Government Integrated Directory, 1992, 1997 and 2002

([http://www.census.gov/govs/go/historical\\_data.html](http://www.census.gov/govs/go/historical_data.html)).

b) Special districts: US Census Bureau, 2002 Census of Governments, Government Organization Public Use Files

([http://www.census.gov/govs/www/02PubUsedoc\\_GovOrg.html](http://www.census.gov/govs/www/02PubUsedoc_GovOrg.html)).

5) Boundary information: US Census Bureau, 2007, TIGER Line Shape files.

(<http://www.census.gov/geo/www/tiger/>).

6) Redistricting information: National Conference of State Legislatures (<http://www.ncsl.org/>) and The United States Elections Project (<http://elections.gmu.edu>), and TIGER Line Shape files (see 5 above).

## 2. Transfers

We use local government revenue data showing how large a transfer various local government units receive from the state budget to identify the extent to which different geographical locations benefit from state budget transfers. These data are collected by the US Census Bureau and come from two sources: The State and Local Government Finance (SLGF) database and the Public Elementary-Secondary Education Finance (PESEF) database.

The SLGF ‘Individual Unit Files’ contain annual accounts of the following local government units: counties, municipalities, townships, school districts, and special districts (divisions established for provision of a particular kind of public service, e.g., water districts, library districts, housing development agencies etc.). We take the data on counties, municipalities, and special districts from the SLGF, and the data on school districts from the PESEF, for reasons we explain below.

The SLGF database contains a census of all local government units for the 1992, 1997, and 2002 fiscal years. In other years, the SLGF database contains a sample of the local government units. We used the data from the three census years to contrast the local government units that are sampled in the non-census years to the entire population of local government units. This exercise shows that, although the sampled units, on average, account for only 10 percent of all local government units, they receive over 80 percent of all state transfers. This fact alleviates potential concerns regarding the effect of a smaller sample size in non-census years.

From the SLGF database’s revenue accounts of local government units, we identify the moneys each unit received from the state budget by the items ‘intergovernmental revenue from state governments’ (item codes beginning with C). These are disaggregated into broad categories of services for which the transfers are intended: education, health and hospitals, highways, housing and community development, public welfare, utilities (water supply, gas supply, electric power, and sewerage), public mass transit systems,

general local government support, and ‘all other’ (US Census Bureau 2006).<sup>1</sup>

Even though school districts are included in the SLGF database, we chose to use the data on state transfers to school districts published in the Public Elementary–Secondary Education Finance (PESEF) database instead. This is firstly because the PESEF database contains information on the entire population of school districts each year and thus has a more complete coverage than the SLGF database. Secondly, the PESEF database disaggregates state support for education. This allows us to separate transfers based on formula (we refer to this as ‘formula spending’) from the rest.<sup>2</sup>

### 3. Legislators

The data on state representatives are constructed from the State Elections Database collected by Carsey et al. (2008). We transform the biannual observations on election results (and in case of Louisiana, one observation every fourth year) into an annual dataset containing a representative for each district for each year.

We cleaned the States Elections Database to ensure that 1) the same legislator is always referred to by exactly the same name, 2) different legislators are referred to by different names, and 3) there are no missing data. We filled in missing data and resolved any ambiguities in the dataset using election records, legislative rosters, and the state government almanacs of individual states, obtained either from the relevant state’s official web site or by contacting it directly.

Taking advantage of the fact that these data go back to 1968, we calculate the number of terms that each legislator has served at any given point in time. Given each state’s term limit laws, we then find the year when each legislator cannot run for re-election. In our calculations, we take account of partial terms arising due to special elections, and service interruptions, which are treated differently in different states.

### 4. From local government units to geographical divisions

In order to match the location of a recipient of state funding (a local government unit) to the legislative district in which it is situated, we use data on the boundaries of the geographical area served by each local government unit. We assume that the benefits of the state transfers are confined to this area (this assumption is discussed in section III of the published paper).

For school districts, the geographical boundaries are available from the US Census Bureau in the form of TIGER Line Shape files, and we are able to match PESEF to the TIGER files directly.<sup>3,4</sup> For counties and municipalities, the area served corresponds to

<sup>1</sup>Although the Census classification of government finances changes during our sample period, the categories of interest for our study are not affected.

<sup>2</sup>The line items we identify as transfers from state budget are under the headings ‘Revenue from state sources’ and ‘State payments on behalf of local education agency’. The line item ‘Revenue from state sources: General Formula Assistance’ is defined as ‘formula spending’.

<sup>3</sup>We have used the 2007 edition of the TIGER Line Shape files throughout. For the various geographical divisions and school districts, we used the boundaries based on the 2000 Census.

<sup>4</sup>For some years, a small number of school districts does not have an identification code in the PESEF database. We

the relevant geographical divisions whose borders are also available in the form TIGER Line Shape files. However, to match SLGF local government units (identified using a special Census code) to the right geographical divisions in the TIGER Line Shape files (identified using Federal Information Processing Standard (FIPS) codes), we had to use the ‘SLGF Directory Information Files’ and the US Census Bureau’s ‘Government Integrated Directory’ which provide a correspondence between the two codes.<sup>5</sup>

Finally, no centralized data are available on the geographical boundaries of special districts. So, we match the special districts to the geographical areas they serve using two approaches. First, for some special districts, the ‘Government Organization 2002 File’ provides information on whether special district boundaries coincide with (1) a county, (2) a municipality, (3) lie entirely within a county, or (4) cover more than one county (with all the relevant counties listed). We match these special districts to the geographical divisions accordingly, with the exception of (3) which we drop. Second, for the majority of special districts that do not have any information on the area they serve in the ‘Government Organization 2002 File’, we infer their geographical location from their name.<sup>6</sup> Using both of these methods, we are able to locate just under 60 percent of the 4,867 special districts covered by the SLGF database.

Finally, in addition to counties, municipalities, school districts, and special districts, which are included in our dataset, SLGF also contains data on the smallest local government units, townships. Unfortunately, the data on township boundaries are not available, and so we had to drop townships as well as the special districts that serve them from our study. These units account for a very small fraction of total state transfers and we can, in fact, match 98 percent of all non-school district transfers (and 100 percent of school district transfers).

##### *5. From geographical divisions to legislative districts and their representatives*

**DISTRICT TRANSFERS** To identify the state House district that benefits from particular state transfers, we matched the geographical boundaries of the local government units to the geographical boundaries of state House districts. We, then, calculate the total transfer received by a House district as the sum of all transfers received by local government units located in it.

More specifically, we take the geographical boundaries for the state legislative districts from TIGER Line Shape files. Each boundary is a polygon whose location on the map is described by several points and their coordinates. We input these boundaries together with the boundaries on the geographical area served by each local government unit into custom-written software which calculates the area overlap between each local recipient of state money and each state House district.

interpolated those from other years.

<sup>5</sup>We checked to see that virtually no geographical entities in our sample changed their FIPS codes during our sample period.

<sup>6</sup>For example, ‘Grundy County Rural Fire Protection District’ we classify as providing services to Grundy County.

Smaller local government units - small and medium sized municipalities and the special districts which serve them - typically lie within one legislative district in their entirety. In such cases, it is straightforward to compute the transfers that the district receives from the state budget as the sum of the transfers to these local government units. On the other hand, larger local government units, e.g., school districts and counties, 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 area overlap between the jurisdiction of each local government unit and the legislative district.<sup>7</sup> This provides an estimate of the size of the transfer from the state budget allocated to each legislative district in each year.

The boundaries of state legislative districts get redrawn every ten years, following the decennial Census.<sup>8</sup> During our sample period, this occurs once, after the year 2000 Census. We take this into account by creating separate matches for the pre- and post-redistricting legislative boundaries.<sup>9</sup> In all states in the sample, except Louisiana, the first election after redistricting is held at the end of 2002 with the legislators taking office in January 2003. Thus, transfers that flow from the state budget approved before this date are allocated to legislative districts using pre-redistricting boundaries, while post-redistricting boundaries are used for the transfers specified in the budgets approved from January 2003 onwards. In Louisiana, the first election using post-redistricting district boundaries is at the end of 2003, and we adjust for this accordingly.

We deflate all transfer data by the annual CPI published by Bureau of Labour Statistics (using their base of 1982-84). To calculate per capita transfers in a given year and district, we took each district's population to be equal to the Census Bureau's state population estimate for that year divided by the number of house districts in the state. The justification for this is the legal requirement that all legislative districts must have the same number of people in them.

**REPRESENTATIVES** We allocate state transfers to the representative who is in office when the appropriate budget is drafted. Both the SLGF and the PESEF database report annual data for the end of a fiscal year rather than by calendar year. In all seven states in the sample, the fiscal year starts in July; so, for example, the 2002 SLGF database provides fiscal information for the period from July 1, 2001 to June 30, 2002. For this reason, the 2002 SLGF data is therefore matched to legislators who are in office in 2001.<sup>10</sup> So unlike

<sup>7</sup>This is equivalent to assuming that benefits from the state transfers are uniformly distributed across the local geographical entity that receives the funds (discussed in section III of the published paper). We checked our findings for robustness by re-estimating the regressions using an alternative weighting by the population of the overlap for the cases where a local government straddles the border of a legislative district. We continue to find that there is a significant negative 'last term effect' in education spending, and it is due to the behavior of the Democrats.

<sup>8</sup>This is required by law to ensure that all districts have an equal number of people.

<sup>9</sup>TIGER 2007 contains shape files for both pre- and post-redistricting legislative boundaries for all the states in the sample.

<sup>10</sup>In our sample five states have annual budgets, and two (Arizona and Ohio) have (some) biannual budgets. In the latter two states, House elections are held for all districts on the same date and the biannual budget is always drafted in the first year after the elections (i.e., in the first year of a representative's two-year term), and so, the same matching algorithm applies to them.

the Census, in the published paper, 2001 refers to the fiscal year July 1, 2001 to June 30, 2002 and so on.

Two states in our sample have multiple member districts (Arizona and South Dakota). For these, we matched each representative to the total transfer received by the district. We take this into account in our estimations by clustering the standard errors at district-year level.

#### 6. States without term limits

Alongside the seven states with term limits that comprise our main sample, we construct a similar dataset for seven states without term limits. We use these data for the estimations reported in Table 7 (columns 1 and 2) of the published paper. Our choice of states for this group is constrained by two requirements: (1) they should never have had term limits (this narrows the possibilities down to 29 states) and (2) the TIGER Line Shape files must contain data on legislative boundaries (this further reduces the possibilities to 22). To focus on states that are as comparable as possible to the states with term limits in our main sample, we select seven states from the same regions and require, within each region, that the selected states border at least one of the states with term limits in the main sample. The sample of states with term limits includes three states in the Midwest (Ohio, Missouri, and South Dakota), two in the South (Louisiana and Oklahoma), and two in the West (Arizona and Colorado). So, for the comparison sample, we select four states in the Midwest (Illinois, North Dakota, Kansas, and Iowa), two states from the South (Alabama and Tennessee) and one state from the West (New Mexico). Table 1 provides a brief summary of these data.

TABLE 1—DESCRIPTIVE STATISTICS FOR THE STATES WITHOUT TERM LIMITS

State	Mean transfer per capita	Number of districts	Sample years
Alabama	435	105	95-05
Iowa	472	100	93-04
Illinois	460	118	93-04
Kansas	539	125	93-04
North Dakota	389	49/47*	93-04
New Mexico	665	70	93-04
Tennessee	543	99	93-04
Average	495		

Note: \* before and after redistricting in 2000.

#### SELECTED REFERENCES

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# Online mathematical appendix for “Distributive Politics and Electoral Incentives: Evidence from Seven US State Legislatures”

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The analysis is predicated on the assumption that voters want to run for office. However, since it personally costly to serve in office, they may not want to do so and we need a condition on the size of the ego-rent to make sure that there is a ready supply of voters willing to serve. We assume that candidates do not learn their type until they are in office. As a consequence, the decision to accept the call to run is based on a comparison between the expected utility of running (and selecting the type-specific equilibrium effort levels) and not running. The assumption that  $M_2 \geq \max\{M_L, M_H\}$  is sufficient to ensure that all types of legislators are willing to run for a second term, conditional on having accepted to serve the first. So, we can focus on finding a condition on the first-term ego-rent that is sufficient to induce a randomly selected citizen to accept to run. Define the expected per-period utility of a voter in district  $k$  who is not running as:

$$(1) \quad Eu(p_k) = (1 - \delta) \left[ v(p^H) - \frac{p^H}{N} \right] + \delta \left[ v(\tilde{p}_k^L) - \frac{\tilde{p}_k^L}{N} \right].$$

Now, consider a voter who before he knows his type as a legislator is called upon to run in an open race against another randomly chosen voter from his district. If he runs, (and plays the type-specific equilibrium strategy), he wins with probability  $\frac{1}{2}$  and his expected utility is

$$(2) \quad (1 - \delta) \left( \frac{1}{2} \left( v(p^H) - \frac{p^H}{N} - a^H c(p^H) + M_1 \right) + \frac{1}{2} Eu(p_k) \right) \\ + \delta \left( \frac{1}{2} \left( v(\tilde{p}_k^L) - \frac{\tilde{p}_k^L}{N} - a^L c(\tilde{p}_k^L) + M_1 \right) + \frac{1}{2} Eu(p_k) \right).$$

If does not run, he expects someone else to run and his payoff is simply  $Eu(p_k)$ . Evaluating the difference between these two payoffs at  $\tilde{p}_k^L = y$ , we conclude that

$$(3) \quad M_1 > (1 - \delta) a^H c(p^H) + \delta a^L c(y)$$

is sufficient to ensure that any randomly selected citizen will accept the call to run.

We note that if  $M_2$  is larger than

$$(4) \quad M_y \equiv a^H c(y) + (1 - \delta) \left[ (v(p^H) - \frac{p^H}{N}) - (v(y) - \frac{y}{N}) \right] > M_S,$$

then it is impossible within the budget for individual legislators of type  $L$  to signal their type and the separating equilibria cannot exist. Consequently, we impose that  $M_2 < M_y$ .

**Online additional results appendix for  
"Distributive Politics and Electoral Incentives: Evidence from Seven US State Legislatures"**

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*This table accompanies section VII of the published paper*

**Role of political parties and the 'last-term effect'**

	(1)	(2)	(3)	(4)
	Total transfers	Education transfers	Discretionary transfers	Non-discretionary transfers
Democrat in last term	-17.3** (7.5)	-15.7*** (5.5)	-13.1** (5.3)	-4.2 (5.1)
Republican in last term	-12.0 (7.6)	-5.0 (4.7)	-5.0 (4.7)	-5.5 (4.6)
Democrat	5.4 (16.2)	-3.1 (14.4)	-3.1 (14.4)	8.4 (12.6)
<i>N</i>	8,166	8,166	8,166	8,166

Notes: Estimates include legislator fixed effects and state-specific year effects. Robust standard errors in parentheses, clustered at the district-year level. N is the number of observations.

\*\*\* significant at 1 percent level, \*\* significant at 5 percent level, \* significant at 10 percent level