

Political Arithmetic: New Evidence on the “Small-State Bias” in Federal Spending

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ABSTRACT

This paper revisits the literature identifying a small-state bias in federal spending, according to which the distribution of federal funds favors the less populous states because they are “overrepresented” in the U.S. Senate. Estimating a panel data model of the determinants of government spending per million capita across the 50 states over a longer time period (1972–2000) than studied hitherto, and controlling for heterogeneity in the memberships of the House and Senate by including the tenures of the states’ congressional delegations, we report evidence supporting the existence of a bias toward states that are overrepresented in both chambers. Our key finding, however, is that the small-state bias is sensitive to the time period considered.

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[I]t does not appear to be without some reason that in a compound republic, partaking both of the national and federal character, the government ought to be founded on a mixture of the principles of proportional and equal representation.

– James Madison (Federalist No. 62)

1. Introduction

After much deliberation during the summer of 1787, the Framers of the United States Constitution designed a new national government comprising three separate branches. In addition to a chief executive and a federal judiciary, a bicameral legislature affording representation to the several states would consist of a House of Representatives, with seats apportioned by population, as determined by decennial census returns, and a Senate, to which each state would send two delegates. In addition to distinct bases of representation, the lengths of the terms served by the members of Congress’s two chambers also would differ, two years in the House and six years in the Senate.

The institutional design of the national legislature was a clever blend of democracy and republicanism. Indeed, but for the “Great Compromise” at Philadelphia that granted small states equal representation in the Senate to counterbalance large states’ dominance of the House, the Constitution might never have been ratified in the first place.* Despite initially seeing the Convention’s acceptance of the representational bar-

* It might with more justice be called the “Franklin Compromise”, since the proposal actually was put forward by that Founder. Dr. Franklin’s conciliatory plan, which also granted exclusive power to originate money bills to the proportionally represented House, passed narrowly, 5–4, on July 16, 1787. The majority coalition consisted of four small states, Connecticut, New Jersey, Delaware and Maryland, plus North Carolina. The small states’ victory was facilitated by deadlock in the Massachusetts delegation, which was therefore unable to cast a vote on Franklin’s compromise. (As was true in the Congress assembled under the Articles of Confederation, each state’s delegation to the Constitutional Convention had a single vote, determined by the preferences of the delegation’s majority.) See Stewart (2007, pp. 111 & 124). As a result of Roger Sherman’s central role in articulating the small states’ demands for equal representation, the term “Connecticut Compromise” sometimes is used (Wood 2006, p. 159).

gain as a serious defeat (Wood 2006, p. 159),[†] James Madison rose vigorously to its defense in Federalist No. 63. There he wrote that the Senate, whose members would represent the interests of the states, would serve as a critical institutional counterweight to the popular passions that regularly would sweep through the House, whose members would represent the interests of the “people”. Comprehending the logic of collective action (Olson 1965), Madison recognized that different chamber sizes and different term lengths would raise the cost of legislating (McCormick and Tollison 1981), thereby reducing the chances that the new government would descend into what many of his colleagues at the Constitutional Convention feared above all, a tyranny of the majority.[‡]

Although the Framers of the American Constitutional Republic had sound reasons for configuring the U.S. Congress as they did, providing each chamber with a different basis of representation and their members with different term lengths and methods of selection, recent contributions to the scholarly literature (e.g., Atlas et al. 1995; Hoover and Pecorino 2005) suggest that, whether intentionally or not, the institutional architecture of the national legislature has produced a “small-state bias” in federal spending. Other things being the same, federal spending per capita is higher in less populous states and that bias is said to arise because small states are “over-represented” in the U.S. Senate. In other words, because two senators are allocated to each state regardless of population, small states tend to wield disproportionate influence in that chamber. Their representation advantage in the Senate supplies small states with the means of achieving greater success

[†] As adumbrated in the Virginia Plan, throughout the Constitutional Convention Madison favored a bicameral national legislature with seats in both chambers apportioned on the basis of population (Wood 2006, p. 152). See also Madison’s “Speech in the Federal Convention Opposing Equal Representation in the Senate (July 14, 1787)”, in Madison ([1772–1836] 1999, pp. 123–125).

[‡] When the Constitution was ratified in 1787, the members of the U.S. House of Representatives were the only national public officials elected by popular vote.

in attracting federal funds than more populous, senatorially “underrepresented” large states.[§]

In this paper we revisit the issue of representation and influence. Following the existing literature, the effectiveness of each state’s congressional delegation is measured in terms of state-specific per capita total federal spending and per capita net federal spending (spending minus taxes). Representation is gauged by the number of senators and representatives entered separately and expressed in per capita terms. We then extend the literature in several ways. Our most important contribution is to ask whether there evidence of a small-state bias over a longer time horizon, 1972–2000, than has been examined previously. We also ask whether small states continue to have disproportionate influence on spending decisions when the tenures of congressional delegations and the identities of the individuals holding leadership positions in the House and Senate are taken into account. Our principal finding is that there appears to be a small-state bias in federal spending, but that its existence is sensitive to the time period examined.

2. Congressional representation

The U.S. Constitution requires seats in the House of Representatives to be apportioned on the basis of state population, with each state guaranteed at least one representative. In 1911, the total membership of the House was fixed at 435,^{**} and has remained so with the exception of a temporary increase to 437 in 1959, when Alaska and Hawaii were admitted to the Union. Alaska and Hawaii each were allotted one representative until reappor-

[§] The terms “over-represented” and “underrepresented” seem unnecessarily pejorative in light of the Framers’ purposes in designing the internal structure of the U.S. Congress to serve as one of many checks and balances that would preserve liberty. That terminology is nevertheless followed herein.

^{**} For a detailed explanation of the methodology for apportionment and how it has changed over time, see the Census Bureau webpage at www.census.gov/population/www/censusdata/apportionment.

tionment based on the 1960 census took effect in 1962. Following the 2000 census, California, with 53 representatives, now has the largest House delegation; at the same time, New York lost two representatives, slipping from 31 to 29. Wyoming, on the other hand, has one.

With House membership fixed and the U.S. population continuously increasing, the population per representative increases dramatically over time. Table 1 traces the “watering down” of representation since 1911.

Patterned after the governors’ councils and state senates that had developed since Independence, the U.S. Senate was designed to protect the rights of individual states, especially small states, in a system of government with great national power.^{††} Under the Articles of Confederation, the national Congress had a single chamber and each state had one vote (Isaacson 2003, p. 314). At the Constitutional Convention, the Virginia delegation initially proposed that the national government be headed by a powerful House of Representatives, with seats apportioned proportionally, which would select the members of the upper legislative chamber, the president and the judiciary. In the event, seeing such a system as too much democracy by half, during its first week in Philadelphia the delegates to the convention, according to James Madison, “agreed ... without debate or dissent” that the national legislature ought to consist of two branches. Moreover, “to give the state governments some stake in the new Congress, the delegates decided that the upper chamber, dubbed the Senate after the Roman precedent, would be chosen by the state legislatures rather than by the House of Representatives” (Id., pp. 448–449).^{‡‡}

^{††} See Byrd (1989) for a detailed history of the U.S. Senate.

^{‡‡} Granting to state legislatures, in Article I, the constitutional power to elect delegates to the U.S. Senate was consistent with at least some Founders’ conception of the that body as representative of the interests of the states as *states* – as a chamber comprising the ambassadors of sovereign state governments to the na-

Whereas House representation is based on population, each state is accorded equal representation in the Senate. Once again, however, with the number of U.S. Senate seats fixed at 100 (since 1960), Table 1 also shows that each senator today represents, on the average, more than one million more people than he or she did a half-century ago.

3. The political economy of federal spending

The empirical economics literature on legislatures starts with George Stigler (1976), who focused on explaining why such bodies vary in size. Observing that “the influence of representation on public policy has not been explored in any depth” and that bicameral legislatures challenge scholars to find a method of weighing one chamber relative to the other when it comes to explaining legislative outcomes, Stigler offers an empirical approach to studying this question. Letting R be representatives, S senators and E expenditures, then $E = a(R + \lambda S)$, where λ calibrates a senator’s influence relative to that of a representative. Stigler then fits the simple linear model $E = aR + b$ to the data. Since $S = 2$, it follows that $\lambda = b/2a$. With New York and California excluded, regressions to explain states’ 1970 shares of federal grants to states and localities (G) and their shares of total federal 1970 nondefense employment (M) are estimated. Stigler finds the relative weight of senators to be 1.02 for grants-in-aid and their relative weight in the employment equation to be 2.42. However, the estimates for these relative weights are not robust.

Crain and Tollison (1977) build on Stigler’s work, but with an effort to better understand the relative influence of senators versus representatives on the allocation of federal spending across states. They point out that Stigler’s model presumes that senators

tional government. The method of selecting the members of the U.S. Senate was changed to popular voting by the Seventeenth Amendment, ratified on April 8, 1913.

and representatives are homogeneous in their ability to influence public policy, when in fact seniority influences their productivities. Crain and Tollison therefore reformulate Stigler's model by including the total years of service of the House and Senate delegations of each state as explanatory variables.

Crain and Tollison find that the total years served in Congress by a state's House delegation has a large and positive influence on the share of federal spending in the state, while the tenure of the state's Senate delegation has essentially no impact. They emphasize the House's constitutional powers over money bills as the primary reason for the Senate's relative unimportance in the cross-state distribution of federal funds.^{§§} They also note, like Stigler, that its first-mover advantage in the budget process helps explain the secular increase in average tenure in the U.S. House of Representatives (see also Polsby 1968; Crain and Tollison 1980).

Crain and Tollison also tested whether seniority is subject to diminishing returns. If not, one representative with 30 years of service would be equivalent to two representatives with tenures of 15 years each. Transforming tenure logarithmically, they show that greater seniority in the House has a positive effect on expenditures, and that it does so at a decreasing rate. They also find that the tenures of Senate delegations remain insignificant in the new specification.

Greene and Munley (1980) dispute Crain and Tollison's results, reasoning that a state's share of federal expenditures could be explained largely by that same state's share of the total U.S. population. They therefore enter each state's share of the U.S. population

^{§§} James Madison himself never assigned much importance to that power, though: "If seven States in the upper branch wished a [money] bill to be originated, they might surely find some member from some of the same States in the lower branch who would originate it." "Speech in the Federal Convention on the Proposed Compromise on State Representation (July 5, 1787)", in Madison ([1772–1836] 1999, p. 120).

as an additional independent variable in Crain and Tollison's regression model. After doing so, Greene and Munley find that neither the tenure of a state's Senate delegation nor that of its House delegation has a significant effect on shares of federal expenditures. However, seats in the House are apportioned on the basis of population, and so including population shares seems to introduce double-counting as well as creating potential multicollinearity problems.

Bennett and Mayberry (1979) investigate the net federal benefits that accrue to states and their relation to representation. Their analysis is based on a consumer (voter) who maximizes utility by electing politicians who can distribute the most benefits to him net of the tax cost. The dependent variable in Bennett and Mayberry's empirical model is defined as the federal tax burden per dollar of grants-in-aid received by a state in 1973. They enter as explanatory variables per capita congressional representation, average tenure in the Senate, average tenure in the House, per capita income, land area and total state population.

For various alternative measures of tax burden to benefit, years in the Senate, per capita income, land area, and population consistently are significant. Congressional representation is significant in only two cases; moreover, the estimated coefficient is negative in sign, implying that larger values of per capita representation are associated with lower tax burdens per dollar of benefits received. Bennett and Mayberry's results may be misleading, however, because they, as do Greene and Munley, use population as an independent variable even though representation is, at least in the case of the House, apportioned on that basis.

Analyzing biennial data from 1972 to 1990, Atlas et al. (1995) find a small-state bias in per capita net federal spending and attribute the bias to unequal per capita representation. A state is over-represented by their definition if it has more senators than would be the case if seats in the Senate were apportioned on the basis of state population, as they are in the House. As a preliminary test of the hypothesis of bias, Atlas et al. divide their sample into over-represented and underrepresented states and then ask whether the means of real per capita net federal outlays are different in the two subsamples. The sample mean for the overrepresented states over the full period (1972–1990) is \$576, while the sample mean for the under-represented states is –\$70. The *t*-statistic for the test of differences in sample means (7.58) is significant at the 1% level of statistical confidence.

Atlas et al. next estimate a fixed effects regression model to explain the cross-state variation in net federal benefits per capita.^{***} The explanatory variables of interest are each state’s per capita representation in the Senate and House, measured as representatives per million of population. A number of proxies for constituents’ interests are included as explanatory variables in Atlas et al.’s regressions. Among these are income per capita in each state as well as the percentages of a state’s population (1) living in rural areas, (2) enrolled in four-year colleges and universities, (3) over 65 years of age, (4) receiving public assistance, (5) receiving unemployment compensation, and (6) over the age of 18 who vote. Other explanatory variables included in the model were total state and local taxes per capita, population growth, the percentage of a state’s House delega-

^{***} Atlas et al. estimate regression models using three alternative dependent variables: *NETSPEND*, computed as the federal spending a state receives less interest payments on the federal debt minus the state’s federal tax; *FEDSPEND*, defined as federal spending less interest payments on the federal debt per capita for each state; and *FEDTAX*, which measures each state’s per capita federal tax burden.

tion who are members of the Democratic Party, and a dummy variable for coastal states, which they reasoned may have comparative advantages in attracting defense spending. The basic model is then estimated after separating per capita federal spending into defense, entitlements, and all other spending.

Atlas et al. conclude that citizens from less populous states fare better in securing net federal benefits as a result of their over-representation in the Senate. In all of their models, per capita representation in the Senate is positive and significant. Per capita representation in the House is significant and positive for federal spending as well as net federal spending, but not for defense, entitlements, or “other” spending categories. However, Atlas et al. make the same implicit assumption as Stigler (1976), that is, they regard all senators and representatives as homogeneous and do not account for differences in legislative seniority.^{†††}

Levitt and Poterba (1999) also examine the geographic distribution of federal funds as a function of congressional representation. They estimate both a partisan model and a legislator-based model of district-specific federal spending. In contrast to Crain and Tollison (1977b; 1980), Levitt and Poterba find that seniority is not a significant determinant of success in securing federal funds.

Hoover and Pecorino (2005) investigate federal expenditures across states, using a more highly disaggregated dataset than did Atlas et al. (1995). They confirm the small-

^{†††} In related work, Atlas, Hendershott, and Zupan (1997) examine how the behavior of senators may differ on the margin of constituent service depending on whether they represent a large- or small-population state. They compare the percentage of a senator’s staff that is allocated to his or her home state office versus the Washington office. Their model predicts that the “effort allocated by senators to local benefit-seeking should be a negative function of the population size of the states represented by those senators” (Atlas, Hendershott and Zupan 1997, p. 221). Using data from the 1970s and 1980s, they test their hypothesis, finding that senators allocate less effort to local benefit-seeking the more populous is the state they represent. This evidence adds a second reason for expecting per capita federal spending in less populous states to exceed that in more populous states. First, less populous states are over-represented in the Senate. Second, their senators spend more time pursuing local benefits for their constituents.

state bias of Atlas et al. with respect to the Senate, finding a positive relationship between per capita senate representation and per capita federal expenditure. However, unlike Atlas et al., Hoover and Pecorino do not find a positive relationship between per capita House representation and federal spending. The latter result could be explained by differences in sample periods. Atlas et al.'s analysis is based on the years running from 1972 to 1990, while Hoover and Pecorino's time series begins in 1983 and ends in 1999. The decade of the 1990s was marked by major events, such as the passage of (Gramm-Rudman-Hollings) "balanced budget" legislation and the "Gingrich Revolution", which may have influenced Hoover and Pecorino's results.^{†††} We will have more to say on this point below.

Observing that "studies of distributive policymaking have usually focused on the House; in fact, such studies typically ignore the Senate altogether", Frances E. Lee (1998, p. 59) examines the geographic distribution of federal funds and representation in the U.S. Senate. Her main result is that states which are overrepresented in the Senate receive greater amounts of per capita federal funds.

Ansolabehere, Gerber and Snyder (2002) find that state expenditures at the county level became more equal following court-ordered redistricting on the basis of "one man, one vote", which sharply reduced differences in the sizes of legislators' constituencies. More evidence of a small state bias is reported by Ansolabehere, Snyder and Ting (2003), who emphasize spillover effects resulting from indivisibilities in spending at the district or state level. Hauk and Wacziarg (2007) track the progress of 2005's \$286.4 billion

^{†††} In subsequent work, Hoover and Pecorino (2007) extend their dataset to 2004, and test for a structural break in the cross-state distribution of federal spending in 1994, when the Republican Party took control of Congress for the first time in 40 years. They do not explicitly address the small-state bias in this later paper, however.

Highway Bill through both chambers of Congress. They find that Senate versions of the legislation exhibited evidence of a small-state spending bias, while House versions did not. More recently, Knight (2008) develops a theoretical model in which small states' overrepresentation in the Senate makes it more likely that they will get seats on subcommittees of that chamber's Appropriations Committee, have proposal power and, hence, fare better in terms of funding than their colleagues from larger states.

In sum, the existing literature points to the conclusion that there is a small-state bias in the distribution of federal government spending. Although most studies find evidence that such a bias exists because small states are overrepresented in the U.S. Senate, whether that bias can also be attributed to the House is still a matter of debate. The literature has not yet adequately addressed the robustness of the result over different time periods, nor has it been consistent in testing the impact seniority may have on the allocation of spending across states. After all, one would expect large states to attempt to neutralize small states' representation advantage in the Senate. Longer senatorial tenures could level the playing field between states that are under-represented and those that are overrepresented.

In the next section, we attempt to fill these gaps in the literature. We test for a small-state bias in federal spending from 1972 through 2000, and in subsamples of the data that follow decennial reapportionment of seats in the House. In doing so, we assemble the separate building blocks of the literature on representation and spending into one explanatory model, controlling for the tenures of states' congressional delegations and for the identities of states represented by individuals holding important leadership positions

in the two chambers. Our principal finding is that the small-state bias is not robust; it does not seem to hold after 1980.

4. Empirical models and data sources

We explore political representation's effect on the geographical distribution of federal funds. Building on the recent work of Atlas et al. (1995) and Hoover and Pecorino (2005), we test for the existence of a small-state bias. In so doing, our empirical analyses use a longer time series of biennial data (1972–2000) than has been studied heretofore. We specify a model to explain the per capita distribution of federal benefits to states that includes per capita representation in both the House and the Senate. Because all senators are not homogenous and neither are representatives, each state's House and Senate delegation is weighted by its average tenure relative to that chamber's average for the corresponding year. We then augment the models by including variables controlling for important congressional leadership positions. Finally, we test the robustness of our results by estimating the model over three subsamples of the full dataset (1972–1980, 1982–1990, and 1992–2000), periods that follow decennial reapportionment of seats in the U.S. House of Representatives.

Federal spending by state omits foreign-aid expenditures, international payments, and interest on the federal debt. For years prior to 1992, observations on that variable were collected from the *Almanac of American Politics* (Barone and Ujifusa, various years).^{§§§} Depending on data availability, tax burdens by state are from that same source plus two publications of the National Tax Foundation, either “Federal Tax Burdens in

^{§§§} Data on federal spending for the remaining years (1992, 1994, 1996, 1998 and 2000) were obtained through personal correspondence with Mr. Norman Trevelyan of the U.S. Census Bureau.

States and Metropolitan Areas” or *Facts and Figures on Government Finance*. The *Almanac of American Politics* also is the source used for calculating the tenures of the states’ Senate and House delegations. State population characteristics are all obtained from the *Statistical Abstract of the United States* (U.S Bureau of the Census, various years). State population estimates are from the U.S. Census Bureau.

4.1. Multivariate statistical models

Two measures of the federal benefits distributed to the states are analyzed. *Net spending per capita* is the state’s federal spending received less its tax burden, the difference being divided by the state’s population. *Federal spending per capita* is the second benefit measure. We begin by attempting to reproduce the results of Atlas et al. (1995) for 1972–1990 on our own dataset.^{****} We then expand the time series of biennial panel data to 2000 and estimate the model over the years 1972–2000.^{††††} The general model estimated is:

$$\text{Net (or Federal) spending per capita} = f(\text{Representatives, Senators, House tenure, Senate tenure, State demographics})$$

Representatives: The size of each state’s House delegation, which ranges in 2000 from one (Wyoming) to 53 (California), is divided by the state’s population in millions. The expectation is that the greater is representation per million capita, the higher will be the state’s per capita federal benefit. Representation per million capita should be more

^{****} The authors were unable to provide us with either their original dataset or their complete regression results.

^{††††} All dollar figures are deflated using the CPI published by the Minneapolis Federal Reserve Bank. For the sample running from 1972 to 1990, we convert to 1990 constant dollars and, for the 1972–2000 sample, to 2000 constant dollars.

equal across states immediately after reapportionment, and less so leading up to the next decennial census.

Senators: Each state's two-member U.S. Senate delegation is divided by the state's population in millions. Once again, the greater is senators per million capita, the higher the state's per capita benefit is expected to be. Because each state gets two senators regardless of its population, small population states necessarily have higher values for this variable. *Senators* is the key variable in testing for the so-called small-state bias.^{****}

House tenure: Seniority is not a perfect measure of influence. Personality characteristics such as charisma and interpersonal skills also have an impact on a representative's ability to attract federal funds to his or her district. However, because seniority plays an important role in gaining favorable committee assignments and advancement to positions of party leadership, we enter it in the expectation that per capita federal benefits will be larger, *ceteris paribus*, in states whose House delegations have more years of service.

House tenure is constructed in two steps. First, dividing the sum of the years served in Congress by the members of a state's House delegation by the number of representatives allotted to the state yields the delegation's average tenure. Second, as noted by Polsby (1968), average tenure grew over the early years of the panel studied here. Because it is the relative seniority of a House delegation that matters, the average tenure of each state's House delegation is measured relative to the overall House average for the

^{****} Note that, as constructed, $Senators = 2/N$, where N is state population in millions. Given that our dependent variables are likewise defined in per-capita terms, one interpretation of the estimated coefficient on *Senators* is that it is equal to twice the baseline federal spending per person over all years and across all states (Fishback et al. 2003, p. 288).

same year. In 1972, for example, the Mississippi delegation's total tenure in the House was 38 years, divided by 5, the number of seats allotted to the state. Mississippi's average House tenure thus was 7.6 years. However, the average tenure for all 50 House delegations was 7.377 years in 1972, so Mississippi's delegation has a relative tenure of 1.0302, 7.6 divided by 7.377.

Senate tenure: The longer the tenure of a state's Senate delegation, relative to that of other states, the higher the state's per capita federal benefits is expected to be. *Senate tenure* is constructed analogously to *House tenure*. Adding the years of service of each state's two senators and dividing by two yields the average tenure of the Senate delegation. Each state's average is then divided by the overall Senate average tenure for that year. Again using Mississippi as an example, in 1972, total Senate tenure was 55 years and so dividing by two, average tenure is 27.5 years. The average tenure of a senate delegation in 1972 was 4.95 years. Mississippi's senate delegation therefore has a relative average tenure of 27.5 divided by 4.95 = 5.5556.

Table 2 shows the overall average tenures of the member of the House and the Senate, biennially, from 1972 through 2000.

The list of control variables in our model mimics that of Atlas et al. (1995). The variable names and a priori expectations are as follows.

Per capita income: A higher per capita income would be expected to reduce the benefits received by a state from the federal government, at least in the form of income transfers associated with entitlement programs, such as Medicaid and Temporary Assistance to Needy Families. However, a high per capita income could also indicate a robust business environment. Those states with high per capita income could be the states with

advanced industrial and technological sectors from which the federal government makes significant purchases of goods and services. As such, the sign on state per capita income is indeterminate a priori.

Rural: Per capita federal spending is expected to be higher in states where larger percentages of the population live in rural areas. Farm programs and economic development grants exemplify.

College: The federal government's subsidization of higher education will tend to channel more federal funds to states with large student populations, measured here as the percentage of the population enrolled in four-year colleges and universities. It is also true that an educated citizenry is more likely to vote. The vote motive may therefore induce congressional delegations representing states having more highly educated citizenries to work harder to secure federal benefits for their constituents. Both considerations argue in favor of a positive effect of education on the cross-state allocation of per capita federal spending.

Over 65: Because of social security and Medicare benefits, larger percentages of citizens over the age of 65 will result in states receiving more federal benefits. Seniors also comprise a well-organized, politically active constituency (through organizations like AARP) that is very effective in lobbying Congress for federal benefits, such as the recently enacted Medicaid Part D.

Public assistance: Greater percentages of citizens receiving public assistance obviously mean that more federal dollars flow to the state, ceteris paribus.

Unemployment: Federal unemployment insurance programs target areas where joblessness is high. Hence, more federal spending is expected to be observed in states where larger percentages of the population are receiving unemployment benefits.

Over 18 who vote: Other things equal, states where larger percentages of the eligible population turn out to vote should receive more federal benefits. Voting is a means by which states elect the congressional delegations that become their agents in competing for national budget allocations. However, larger voting populations also are more prone to free-riding by the prospective beneficiaries of federal spending. The effect of voting population on state benefits consequently is ambiguous.

Democrats in House: Atlas et al. (1995) controlled for political party affiliations in the House by computing the percentage of each state delegation's seats occupied by Democrats, perhaps reasoning that members of that party tend to spend more. We include it in an attempt to reproduce their results, but we have no a priori expectations for the sign on this variable.

Coastal: The inclusion of a dummy variable for coastal states also follows Atlas et al. (1985), who reason that coastal states may enjoy advantages in securing federal defense spending dollars.^{§§§§}

4.2. Preliminary data analysis

Atlas et al. (1995) divided the U.S. states into two categories, overrepresented and underrepresented. By their definition, states are over-represented when they have more representation in the Senate than would be allocated to them if seats in the Senate were appor-

^{§§§§} According to the Federal Reserve Bank of Atlanta (2003), "Florida and Georgia claim the fourth- and fifth-largest allocations for military spending in the nation."

tioned on the same basis as seats in the House, namely, by population. As preliminary evidence that over-represented states capture more federal benefits than underrepresented states, Atlas et al. computed net spending per capita for each group. Their results are reproduced in Table 3.

We calculate net federal spending per capita by state over the same years using our independently collected dataset. The results are shown in Table 4, which also includes the average tenures in the House and Senate. Our classification of states as over- or underrepresented follows that of Atlas et al. (1995).

The per capita net spending figures for the two groups are similar to those produced by Atlas et al. Senate tenure is higher for each year and for the sample overall for those states labeled over-represented. On the other hand, House tenure is higher for each year and for the sample overall for those states labeled underrepresented. Consistent with Atlas et al., a small-state bias in federal spending emerges in Table 4: over-represented states receive more net federal spending per capita in every biennium from 1972 through 1990.

Our calculations suggest that some states fare better than others both because of “over-representation” and the longer tenures of their Senate delegations, 9.8 years versus 8.2 years overall. The longer average tenures of the House delegations sent to Washington by the underrepresented states is an unexpected result. A possible explanation is that small population states realize they have proportionally more power in the Senate than they do in the House, and to exploit this comparative advantage they reelect their senators more often. This conjecture also helps explain the result for House tenure. Large population states have proportionally greater representation in the lower chamber and to take

advantage of that dominant position, tend to reelect the incumbent members or their House delegations more frequently.

Whether or not these findings hold up in a multivariate regression framework is a question to which we now turn. We first reproduce Atlas et al.'s results for 1972–1990, and then extend the analysis through 2000.

4.3. Estimated models and results

We estimate a fixed effects model for two time periods, 1972–1990, biennially, and 1972–2000, also biennially. The first period, 1972–1990, is our attempt to replicate the Atlas et al. (1995) results. Variables controlling for the tenures of the states' House and Senate delegations accordingly are not entered since they were not included in their original paper. The coefficients estimated for this model are reported in Table 5.

The results in Table 5 are similar to those Atlas et al. report. House representation per million capita (*Representatives*) and Senate representation per million capita (*Senators*) are both significant in explaining the two dependent variables, net spending per capita and federal spending per capita. However, in both regressions, the coefficients reported by Atlas et al. for *Senators* are substantially larger than ours, \$787.13 for net federal spending per capita and \$792.75 for federal spending per capita. The coefficients for *Senators* here are \$224.23 and \$220.95. The differences are much smaller in the case of the House. Atlas et al. report coefficients for *Representatives* of \$407.30 and \$360.83, while those estimated here are \$322.59 and \$369.13. The variables *Rural*, *Over 65* and *Coastal* likewise are significant for both dependent variables. *Unemployment* is significant only for the dependent second variable, federal spending per capita, whereas *Per*

Capita Income is significant only for the first dependent variable, net federal spending per capita.

Despite large differences in the magnitudes of the estimated coefficients on *Senators*, the implications of the results in Table 5 do not differ markedly from those of Atlas et al. Comparing over- and underrepresented states in the Senate, Atlas et al. (1995, p. 667) write that

In 1990, for example, the regression results imply a difference of \$1,148 in the per capita federal net spending obtained by the most over- and underrepresented states in the Senate: Wyoming and California, respectively. In total, it is estimated that California residents would receive an additional \$25 billion in annual federal net spending if their representation in the Senate were proportionate to their population. For the same year, the difference in per capita federal net spending obtained by the most over- and underrepresented states in the House – Montana and South Dakota, respectively – is \$303. In tandem, these results are consistent with representational disparities in the House being smaller in magnitude and more transitory (due to reapportionment every decade) than those in the Senate.

Using the regression results obtained here, and the values in 1990 for Wyoming's and California's House representation per million capita and Senate representation per million capita, and considering only the coefficients for *Representatives* and *Senators*, the estimated difference in per capita federal net spending is \$1,196. However, according to our calculations, the most over- and underrepresented states in the House in 1990 are Montana and Arizona, respectively. As a result, the difference in per capita federal net spending obtained is \$806.

We next augment Atlas et al.'s results for 1972–1990 by including as explanatory variables the relative tenures of each state's House and Senate delegations. To do so, we create interaction terms, *Tenured Representatives* and *Tenured Senators*. These variables are constructed by multiplying *Representatives* and *Senators*, still defined as the number

of members of a state's House and Senate delegation per million capita, by the average years of tenure of that delegation relative to the overall chamber average, labeled *House Tenure* and *Senate Tenure*, respectively. This adds four new variables to the regression specification of Atlas et al. The regression results are shown in Table 6.

Tenured Representatives is significant. In addition, the two components of the interaction term, *House Tenure* and *Representatives* (per million capita), are themselves significant. *Tenured Senators* is not significant, nor is *Senate Tenure*. However, *Senators* (per million capita) is. To put these results in perspective, consider again the most over- and underrepresented states in the Senate in 1990, based on Senators per million capita, namely California and Wyoming. Taking only the significant variables into account, namely, *Tenured Representatives*, *House Tenure*, *Representatives* and *Senators*, the implied difference in net federal spending per capita between the two states is \$1,181.

In 1990, the implied difference in net federal spending per capita between the most over-represented state, Montana, and the most underrepresented state, Arizona, is \$281. The same demographic variables are significant and the explanatory powers of the two models increase modestly.

California and Wyoming or Montana and Arizona are only two polar examples from which implications for 1990 can be drawn. A more general question is whether the marginal effects of *Representatives* and *House Tenure* on the two dependent variables, net federal spending per capita and federal spending per capita, differ on average at the means of those three variables. The partial derivative of net federal spending per capita with respect to *Representatives* per million capita is \$3.37 when evaluated at the mean of *House Tenure*. The partial derivative of net federal spending per capita with respect to

House Tenure is \$44.52 when evaluated at the mean of *Representatives*. Similar calculations for federal spending per capita yield \$127.29 and \$46.71. The marginal effect of *Senators* per million capita on net federal spending per capita or federal spending per capita is \$201.81 and \$169.01.

The next step is to extend the end of the dataset from 1990 to 2000. In doing so, we convert all dollar amounts to 2000 constant dollars. Omitting tenure, Table 7 reports results for the two dependent variables, net federal spending per capita and federal spending per capita. The results are similar to those obtained for the shorter time period, 1972–1990.

Representatives per million capita and *Senators* per million capita are significant in both regressions, entering with estimated coefficients that are of the same magnitude as those for 1972–1990. The demographic variables *Rural*, *Over 65* and *Coastal* likewise continue to retain their significance. *Per Capita Income* is significant for net spending per capita; *Unemployment* is significant for federal spending per capita. The overall fit is slightly better for this expanded time period. The adjusted R²s are 0.43 and 0.41, compared to 0.30 and 0.36 for 1972–1990.

In 2000, California and Wyoming are again the most under- and over-represented states in the Senate. Nevada and Wyoming are the most under- and over-represented states in the House. Using the regression results obtained here, and the values in 2000 for Wyoming's and California's House and Senate representation per million capita, considering only the coefficients for *Representatives* and *Senators*, the estimated difference in per capita federal net spending is \$1,405. For Wyoming and Nevada, the difference in per capita federal net spending is \$1,319.

After expanding the end of the dataset to 2000, we examine the results of the two regressions when tenure is included. They are reported in Table 8.

All of the variables associated with the House – *Tenured Representatives*, *House Tenure* and *Representatives per million capita* – are significant. Similar to the earlier time period examined, the only variable associated with the Senate that is significant is *Senators per million capita*. *Rural*, *Over 65* and *Coastal* are again significant for both dependent variables. As before, *Per Capita Income* is significant for net spending per capita and *Unemployment* is significant for federal spending per capita. The adjusted R^2 improves slightly with the expanded time period, to 0.44 and 0.43 from 0.34 and 0.38 previously.

In 2000, the difference in net federal spending per capita implied between California and Wyoming is \$1,337. For Nevada and Wyoming, the most under- and over-represented states in the House, the difference in net federal spending per capita is \$1,857.

In sum, our results generally support Atlas et al. There seems to be a small-state bias in both the Senate and the House even when the sample is expanded to 2000. Adding tenure has several effects. First, tenure is positive and significant in the House; it is not significant in the Senate. The interaction between representation and tenure in the House is negative, but not enough to offset the overall positive effect.

The small-state bias also persists when we take account of the states represented by the holders of key leadership positions in the House and Senate. In results not reported here, but available upon request, we entered dummy variables denoting whether one of the members of a state's congressional delegation was at any time the Senate Majority Leader, the Senate Finance Committee Chairman, the Speaker of the House, or the House

Ways and Means Committee Chairman, all of whom play important roles in determining the geographical distribution of federal funds. In terms of federal spending per capita, states represented by congressional leaders may have a competitive advantage in securing benefits for their constituents. (The identities of these individuals and their periods of service are listed in the appendix.)

Of the four leadership roles we examined, only the Senate Finance Committee Chairman and House Ways and Means Committee Chairman entered significantly – and they did so with unexpectedly negative signs. All other coefficient estimates remained essentially unchanged. The leadership of the Senate is dominated by senators from under-represented states. These states apparently gain nothing additional from being represented by senators who are elected as majority leader or appointed by him to chair the Finance Committee. As a matter of fact, the reverse seems to be true in the case of the chairmen of the Senate Finance Committee. So, too, it seems with the chairmanship of the House Ways and Means Committee.

5. Structural change and reapportionment

Representation in the House and the Senate is a statistically significant determinant of both net federal spending per capita and federal spending per capita. Over the two time periods we examined, 1972–1990 and 1972–2000, per capita federal spending is higher in overrepresented states, that is, those with more House members and more senators per million of population. The distribution of federal funds also tends to benefit disproportionately states whose House delegations have tenures longer than the average state.

Reapportionment of House seats took place three times from 1972 to 2000. Considering that population is growing and mobile, Representatives per million capita and Senators per million capita change from year to year. However, as states gain or lose House seats, reapportionment also causes changes in Representatives per million capita. Although the number of Representatives is fixed at 435, seats move around from state to state. Based on the decennial census, reapportionment becomes effective two years later. For example, the 1970 census returns changed the number of seats allotted to the various states in 1972.

With reapportionment as a possibly important structural change, we divide the full 1972–2000 sample into three subsamples: 1972–1980, 1982–1990 and 1992–2000. As a starting point, we examine the descriptive statistics of *Representatives* per million capita, *Senators* per million capita, *House Tenure* and *Senate Tenure* for each of the subsamples. The results are shown in Table 9.

The descriptive statistics reveal some interesting trends. The differences between the minimums and maximums of *Representatives* and *Senators* both get smaller over the three time periods. The standard deviations of *Representatives* and *Senators* also decline. The maximum for *House Tenure* increases. (Recall that *House Tenure* is measured as a state delegation’s tenure relative to the average House delegation tenure.) As the differences in *Representatives* are narrowing, the gap in *House Tenure* gets larger.

To explore the effects of reapportionment, if any, we estimate models for each of the subsamples, with and without tenure and with per capita spending adjusted to constant 2000 dollars. The results are reported in Tables 10 through 13.

The estimated coefficients and explanatory powers of the regressions vary widely over the three subsamples. The coefficients for each of the subsamples are very different from those of the full dataset (1972–2000). It appears that the first subsample is the only one exhibiting a significant small-state bias and, indeed, is driving the results we obtained on the full sample of data. Only for 1972–1980 are the results for either net federal spending per capita or federal spending per capita consistent with those reported earlier in the paper, or by Atlas et al. (1995) for that matter. *Senators* is uniformly significant in Tables 10 and 11. Major differences are evident for the House: *Representatives* is significant only in the first time period, 1972–1980, and the overall sample, 1972–2000.

6. Summary and conclusions

We address the geographical distribution of federal funds and issues of representation and tenure. Specifically, we estimate statistical models to explain federal spending per capita and net federal spending per capita (spending less taxes), using representatives per capita and senators per capita, but also weighting them for relative tenure. We also consider congressional leadership positions and the role they play in the distribution of federal funds. Our findings show that there is a small-state bias that is not offset by tenure.

However, when we divide our sample into three subsamples following reapportionment of seats in the House of Representatives, we find the results to be sensitive to the time-period examined. While evidence of a small-state bias exists in the full sample running from 1972 through 2000, it does not hold up consistently, and is especially weak both in 1982–1990 and 1992–2000.

The existence of a small-state bias in federal spending thus seems to hinge on events in the decade of 1972–1982. We can only speculate as to why this should be so and, hence, leave it as a question to be settled by future research.

It is perhaps worth emphasizing, however, that the Founders deliberately designed a bicameral national legislature with an eye to providing small states a representation advantage in one chamber (the Senate) that would offset the disadvantage they would have in the other (the House). The very notion that a small-state bias in federal spending exists therefore rests on a counterfactual supposition, namely, that large states would fare better if the U.S. Congress had been a unicameral body or, alternatively, if seats in the House and the Senate had both been apportioned on the basis of population. They were not. The Framers did not design the federal government to be democratic, but to be republican.

Interestingly, however, when we find evidence supporting a small-state bias (in 1972–1980 and in the full sample), the bias favors states that are overrepresented in both the House and the Senate and, moreover, in per capita terms overrepresentation in the former chamber is considerably more valuable.

At the end of the day, though, our key finding is that the small-state bias in federal spending may be unique to the decade of the 1970s. If so, the unintended fiscal consequences of states having equal representation in the Senate may only be a matter of historical curiosity.

Appendix

Table A.1. Senate Majority Leaders

Name	State	Time
Mike Mansfield (D)	Montana	1961–1977
Robert C. Byrd (D)	West Virginia	1977–1981
Howard H. Baker, Jr. (R)	Tennessee	1981–1985
Robert J. Dole (R)	Kansas	1985–1987
Robert C. Byrd (D)	West Virginia	1987–1989
George J. Mitchell (D)	Maine	1989–1995
Robert J. Dole (R)	Kansas	1995–1996
Trent Lott (R)	Mississippi	1996–2001

Source: U.S. Senate webpage, <http://senate.gov>.

Table A.2. Senate Finance Committee Chairmen

Name	State	Time
Russell B. Long (D)	Louisiana	1961–1980
Robert J. Dole (R)	Kansas	1981–1984
Bob Packwood (R)	Oregon	1985–1986
Lloyd Bentsen (D)	Texas	1987–1992
Daniel Patrick Moynihan (D)	New York	1993–1994
William V. Roth, Jr. (R)	Delaware	1995–2000

Source: U.S. Senate webpage, <http://senate.gov>.

Table A.3. Speakers of the House

Name	State	Time
Carl B. Albert (D)	Oklahoma	1971–1976
Thomas P. O’Neill, Jr. (D)	Massachusetts	1977–1986
James C. Wright, Jr. (D)	Texas	1987–1989
Thomas C. Foley (D)	Washington	1989–1994
Newt Gingrich (R)	Georgia	1995–1998
J. Dennis Hastert (R)	Illinois	1995–2000

Source: U.S. House webpage, <http://house.gov>.

Table A.4. House Ways and Means Committee Chairmen

Name	State	Time
Wilbur D. Mills (D)	Arkansas	1957–1974
Al Ullman (D)	Oregon	1975–1980
Dan Rostenkowski (D)	Illinois	1981–1994
Bill Archer (R)	Texas	1995–2001

Source: U.S. House webpage, <http://house.gov>.

References

- Ansolabehere, Stephen, Gerber, Alan & Snyder, James. (2002). "Equal Votes, Equal Money: Court-Ordered Redistricting and Public Expenditures in the American States." *American Political Science Review* 96 (4): 767–777.
- Ansolabehere, Stephen, Snyder, James, & Ting, Michael M. (2003). "Bargaining in Bicameral Legislatures: When and Why Does Malapportionment Matter?" *American Political Science Review* 97 (3): 471–481.
- Atlas, Cary M.; Gilligan, Thomas W.; Hendershott, Robert J. & Zupan, Mark A. (1995). "Slicing the Federal Government Net Spending Pie: Who Wins, Who Loses, and Why." *American Economic Review* 85(3): 624–629.
- Atlas, Cary M., Hendershott, Robert J., & Zupan, Mark A. (1997). "Optimal Effort Allocation by U.S. Senators: The Role of Constituency Size." *Public Choice* 92(3): 221–229.
- Barone, Michael, & Ujifusa, Grant. (various years). *Almanac of American Politics*. Washington, DC: National Journal.
- Bennett, James T., & Mayberry, Eddie R. (1979). "Federal Tax Burdens and Grant Benefits to States: The Impact of Imperfect Representation." *Public Choice* 34(2): 255–269.
- Byrd, Robert C. (1989). *The Senate 1789–1989: Addresses on the History of the United States Senate*. Washington, DC: U.S. Government Printing Office.
- Crain, W. Mark, & Tollison, Robert D. (1977). "Influence of Representation on Public Policy" *Journal of Legal Studies* 6(2): 355–361.
- Crain, W. Mark, & Tollison, Robert D. (1980). "Representation and Influence: A Reply." *Journal of Legal Studies* 10(1): 215–219.
- Federal Reserve Bank of Atlanta (2003). "Defense Spending Flies High in the Southeast." *EconSouth* 5(2): 2–9.
- Fishback, Price V., Kantor, Shawn & Wallis, John Joseph (2003). "Can the New Deal's Three Rs be Rehabilitated? A Program-by-Program, County-by-County Analysis." *Explorations in Economic History* 40(3): 278–307.
- Greene, Kenneth V., & Munley, Vincent G. (1980). "The Productivity of Legislators' Tenure: A Case Lacking in Evidence." *Journal of Legal Studies* 10(1): 207–214.
- Hauk, William R., & Wacziarg, Romain. (2007). "Small States, Big Pork." *Quarterly Journal of Political Science* 2(1): 95–106.

- Hoover, Gary A., & Pecorino, Paul. (2005). "The Political Determinants of Federal Expenditure at the State Level." *Public Choice* 123: 95–113.
- Hoover, Gary A., & Pecorino, Paul (2007). "Federal Spending and the Revolution of '94." Working Paper, University of Alabama.
- Isaacson, Walter (2001). *Benjamin Franklin: An American Life*. New York: Simon & Schuster.
- Knight, Brian G. (2008). "Legislative Representation, Bargaining Power and the Distribution of Federal Funds: Evidence from the US Congress." *Economic Journal* 118(532): 1785–1803.
- Lee, Frances E. (1998). "Representation and Public Policy: The Consequences of Senate Apportionment for the Geographic Distribution of Federal Funds." *Journal of Politics* 60(1): 34–62.
- Levitt, Steven D., & Poterba, James M. (1999). "Congressional Distributive Politics and State Economic Performance." *Public Choice* 99(1): 185–216.
- Madison, James ([1772–1836] 1999). *Writings*. New York: Library of America.
- Matthews, Michelle Belk (2003). "Political Economy of Federal Spending, 1972–2000", unpublished Ph.D. dissertation, University of Mississippi, University, MS.
- McCormick, Robert E., & Tollison, Robert D. (1981). *Politics, Legislation, and the Economy: An Inquiry into the Interest-Group Theory of Government*. Boston: Martinus Nijhoff.
- National Tax Foundation, Inc. (various years). *Facts and Figures on Government Finance*. New York: National Tax Foundation, Inc.
- National Tax Foundation, Inc. (various years). "Federal Tax Burdens in States and Metropolitan Areas." New York: National Tax Foundation, Inc.
- Olson, Mancur (1965). *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press.
- Polsby, Nelson W. (1968). "The Institutionalization of the U.S. House of Representatives." *American Political Science Review* 62(1): 144–168.
- Stewart, David O. (2007). *The Summer of 1787: The Men Who Invented the Constitution*. New York: Simon and Schuster.
- Stigler, George J. (1976). "The Sizes of Legislatures." *Journal of Legal Studies* 17(1): 26–31.

U.S. Bureau of the Census (various years). *Statistical Abstract of the United States*. Washington, DC: U.S. Government Printing Office.

Wood, Gordon S. (2006). *Revolutionary Characters: What Made the Founders Different*. New York: Penguin.

Table 1. Population per U.S. Representative and Senator, 1910–2000

Census Year	Total U.S. Population	Total House Seats	Population per Representative	Total Senate Seats	Population per Senator
2000	281,421,906	435	646,947	100	2,814,219
1990	248,709,873	435	571,747	100	2,487,099
1980	226,542,199	435	520,787	100	2,265,422
1970	203,302,031	435	467,361	100	2,033,020
1960	179,323,175	435	412,237	100	1,793,232
1950	151,325,798	437 ^a	346,283	96	1,576,310
1940	132,164,569	435	303,827	96	1,376,714
1930	123,202,624	435	283,224	96	1,283,361
1920	106,021,537	435	243,728	96	1,104,391
1910	92,228,496	435	212,020	92	1,002,484

^a Alaska and Hawaii joining the Union resulted in a temporary increase to 437 in 1959.

Table 2. Average Delegation Tenures in the U.S. House and Senate, in years

Year	House	Senate
1972	7.377	9.900
1974	6.986	10.050
1976	6.439	9.310
1978	6.866	8.190
1980	6.250	7.310
1982	6.518	8.540
1984	7.384	9.140
1986	8.077	9.520
1988	8.453	9.820
1990	8.609	1.150
1992	7.600	1.120
1994	6.845	1.520
1996	6.244	0.200
1998	7.331	1.030
2000	8.011	11.220

Source: Authors' calculations.

Table 3. “Over-represented” and “Underrepresented” States

Year	Over-represented		Underrepresented	
	Number of states	Per capita net federal spending	Number of states	Per capita net federal spending
1972	34	\$855	16	-\$79
1974	34	604	16	-220
1976	34	856	16	263
1978	34	808	14	232
1980	33	494	17	-100
1982	33	285	17	-169
1984	33	541	17	175
1986	35	586	15	89
1988	34	428	15	-383
1990	34	290	16	-494
1972-90	338	\$576	159	-\$70

Source: Atlas et al. (1995, p. 625).

Table 4. Net Spending per Capita, Senate Tenure and House Tenure for Over-represented and Underrepresented States

Year	Over-represented				Underrepresented			
	Number of states	Net federal spending	Average Tenure		Number of states	Net federal spending	Average Tenure	
			Senate	House			Senate	House
1972	34	\$771.56	10.74	6.38	16	-\$326.55	8.13	9.49
1974	34	462.36	10.53	6.12	16	-466.10	9.03	8.81
1976	34	720.72	9.91	5.61	16	-49.20	8.03	8.21
1978	34	662.59	8.12	6.25	14	91.51	7.96	8.12
1980	33	427.59	7.58	5.34	17	-98.59	6.79	8.03
1982	33	155.94	9.12	5.85	17	-152.77	7.41	7.81
1984	33	573.54	9.98	6.82	17	183.00	7.50	8.49
1986	35	617.04	10.17	7.56	15	88.70	8.00	9.29
1988	35	309.63	10.20	7.85	15	-397.08	8.93	9.86
1990	34	321.02	11.41	7.55	16	-569.03	10.59	10.85
1972-90	339	\$503.00	9.79	6.544	159	-\$170.32	8.22	8.88

Source: Authors' calculations.

Table 5. Net Spending and Federal Spending per Capita, 1972–1990^a

	Net spending per capita	Federal spending per capita
Explanatory variables:		
<i>Representatives</i>	322.59 (2.008)*	369.13 (2.540)**
<i>Senators</i>	224.23 (5.028)**	220.95 (5.478)**
<i>Per Capita Income</i>	-0.23 (-10.105)**	0.13 (0.614)
<i>Rural</i>	-7.55 (-1.983)*	-11.51 (-3.340)**
<i>College</i>	47.10 (1.002)	21.89 (0.515)
<i>Over 65</i>	-82.73 (-4.022)**	-75.36 (-4.051)**
<i>Public Assistance</i>	-8.59 (-0.349)	-17.17 (-0.771)
<i>Unemployment</i>	40.96 (1.280)	83.45 (2.883)**
<i>Over 18 who Vote</i>	-7.72 (-1.465)	-5.08 (-1.066)
<i>Democrats in House</i>	-.71 (-0.496)	-1.14 (-0.874)
<i>Coastal</i>	241.06 (2.685)**	353.63 (4.354)**
Adjusted R²	0.30	0.36

^a *t*-statistics are in parentheses; asterisks denote significance at the 0.05 (*) and 0.01 (**) levels.

Table 6. Net Spending and Federal Spending, Tenure-Weighted Delegations, 1972-1990^a

	Net Spending per Capita	Federal Spending per Capita
Explanatory variables:		
<i>Tenured Representatives</i>	-1452.43 (-5.672)**	-1167.28 (-5.006)**
<i>Tenured Senators</i>	13.64 (0.222)	47.57 (0.851)
<i>House Tenure</i>	2864.56 (5.703)**	2313.08 (5.058)**
<i>Senate Tenure</i>	-16.98 (-0.184)	-73.25 (-0.872)
<i>Representatives</i>	1455.80 (5.711)**	1294.56 (5.577)**
<i>Senators</i>	201.81 (2.639)**	169.01 (2.427)**
<i>Per Capita Income</i>	-0.22 (-10.104)**	0.14 (0.690)
<i>Rural</i>	-6.91 (-1.855)	-10.78 (-3.179)**
<i>College</i>	57.99 (1.259)	31.85 (0.760)
<i>Over 65</i>	-95.93 (-4.719)**	-87.28 (-4.715)**
<i>Public Assistance</i>	10.92 (0.443)	-2.14 (-0.096)
<i>Unemployment</i>	24.37 (0.767)	71.47 (2.471)**
<i>Over 18 who Vote</i>	-4.10 (-0.786)	-2.34 (-0.492)
<i>Democrats in House</i>	0.70 (0.489)	0.08 (.062)
<i>Coastal</i>	224.75 (2.500)**	352.25 (4.303)**
Adjusted R²	0.34	0.38

^a See Table 5.

Table 7. Net Spending and Federal Spending per Capita, 1972–2000^a

	Net Spending per Capita	Federal Spending per Capita
Explanatory variables:		
<i>Representatives</i>	377.22 (2.029)*	436.74 (2.577)**
<i>Senators</i>	306.03 (6.386)**	321.60 (7.364)**
<i>Per Capita Income</i>	-0.26 (-15.799)**	0.00 (0.034)
<i>Rural</i>	-7.44 (-1.891)	-11.43 (-3.187)**
<i>College</i>	43.76 (0.889)	10.22 (0.228)
<i>Over 65</i>	-104.94 (-4.945)**	-89.45 (-4.625)**
<i>Public Assistance</i>	17.03 (0.642)	8.76 (0.363)
<i>Unemployment</i>	52.21 (1.414)	103.42 (3.072)**
<i>Over 18 who Vote</i>	-0.46 (-0.611)	-0.46 (-0.676)
<i>Democrats in House</i>	2.69 (1.793)	1.68 (1.228)
<i>Coastal</i>	385.26 (4.082)**	474.88 (5.521)**
Adjusted R²	0.43	0.41

^a See Table 5.

Table 8. Net Spending and Federal Spending, Tenure-Weighted Delegations, 1972–2000^a

	Net Spending per Capita	Federal Spending per Capita
Explanatory Variables		
<i>Tenured Representatives</i>	-1334.28 (-5.216)**	-1071.79 (-4.582)**
<i>Tenured Senators</i>	-28.78 (-0.439)	-12.95 (-0.216)
<i>House Tenure</i>	2533.74 (5.433)**	2086.54 (4.892)**
<i>Senate Tenure</i>	95.98 (1.012)	61.52 (0.709)
<i>Representatives</i>	1371.21 (5.153)**	1244.78 (5.115)**
<i>Senators</i>	320.14 (3.787)**	328.84 (4.254)**
<i>Per Capita Income</i>	-0.26 (-15.686)**	0.00 (0.143)
<i>Rural</i>	-7.23 (-1.856)	-11.36 (-3.190)**
<i>College</i>	52.80 (1.088)	17.46 (0.393)
<i>Over 65</i>	-99.32 (-4.758)**	-84.37 (-4.419)**
<i>Public Assistance</i>	22.70 (0.846)	9.48 (0.386)
<i>Unemployment</i>	35.77 (0.975)	88.12 (2.628)**
<i>Over 18 who Vote</i>	-0.51 (-0.689)	-0.49 (-0.738)
<i>Democrats in House</i>	2.62 (1.756)	1.58 (1.157)
<i>Coastal</i>	353.82 (3.667)**	460.09 (5.215)**
Adjusted R²	0.44	0.43

^a See Table 5.

Table 9. Descriptive Statistics for Three Subsamples

Time	Mean	Standard Deviation	Minimum	Maximum
<i>Representatives per million capita</i>				
1972–1980	2.0312	0.2905	1.2500	3.0769
1982–1990	1.8520	0.2204	0.9870	3.4299
1992–2000	1.6370	0.1715	1.0010	2.1552
<i>Senators per million capita</i>				
1972–1980	1.2429	1.2973	0.0845	6.1538
1982–1990	1.0769	1.0707	0.0671	4.4843
1992–2000	0.9850	1.0014	0.0590	4.3103
<i>House Tenure</i>				
1972–1980	1.0000	0.5302	0.0000	2.2904
1982–1990	1.0000	0.4471	0.0000	2.3014
1992–2000	1.0000	0.5759	0.0000	3.6833
<i>Senate Tenure</i>				
1972–1980	1.0000	0.7136	0.0000	3.6630
1982–1990	1.0000	0.5503	0.1018	2.8103
1992–2000	1.0000	0.6750	0.0000	3.4759

Table 10. Subsample Results for Federal Spending per Capita without Tenure^a

	1972–1980	1982–1990	1992–2000	1972–2000
Explanatory variables:				
<i>Representatives</i>	860.84 (3.508)**	228.79 (0.694)	261.52 (0.653)	436.74 (2.577)**
<i>Senators</i>	268.05 (4.064)**	211.69 (2.485)**	379.79 (4.568)**	321.60 (7.364)**
<i>Per Capita Income</i>	-0.04 (-1.029)	-0.01 (-0.422)	-0.01 (-0.536)	0.00 (0.034)
<i>Rural</i>	-20.94 (-3.124)**	-15.85 (-2.463)**	-5.29 (-0.909)	-11.43 (-3.187)**
<i>College</i>	60.68 (0.840)	13.77 (0.158)	-61.63 (-0.694)	10.22 (0.228)
<i>Over 65</i>	-161.41 (-4.884)**	-65.97 (-1.848)	-58.62 (-1.794)	-89.45 (-4.625)**
<i>Public Assistance</i>	-62.54 (-1.563)	-5.40 (-0.125)	76.13 (1.767)	8.76 (0.363)
<i>Unemployment</i>	212.19 (4.329)**	-1.94 (-0.031)	53.15 (0.668)	103.42 (3.072)**
<i>Over 18 who Vote</i>	-19.34 (-2.284)*	6.81 (0.737)	-0.37 (-.5 68)	-0.46 (-0.676)
<i>Democrats in House</i>	-5.77 (-2.600)**	1.38 (0.491)	6.44 (2.862)**	1.68 (1.228)
<i>Coastal</i>	379.34 (2.635)**	518.30 (3.282)**	428.76 (2.871)**	474.88 (5.521)**
Adjusted R ²	0.47	0.22	0.19	0.41

^a See Table 5. Dollar amounts are in 2000 constant dollars.

Table 11. Subsample Results for Net Spending per Capita without Tenure^a

	1972–1980	1982–1990	1992–2000	1972–2000
Explanatory variables:				
<i>Representatives</i>	826.12 (3.068)**	185.00 (0.510)	21.67 (0.051)	377.22 (2.029)*
<i>Senators</i>	282.12 (3.898)**	180.69 (1.927)*	302.49 (3.433)**	306.03 (6.386)**
<i>Per Capita Income</i>	-0.30 (-7.655)**	-0.22 (-7.881)**	-0.30 (-12.851)**	-0.26 (-15.799)**
<i>Rural</i>	-18.22 (-2.477)**	-9.67 (-1.365)	-1.22 (-0.199)	-7.44 (-1.891)
<i>College</i>	101.64 (1.283)	27.07 (0.282)	20.30 (0.216)	43.76 (0.889)
<i>Over 65</i>	-181.92 (-5.016)**	-70.58 (-1.796)	-70.40 (-2.033)*	-104.94 (-4.945)**
<i>Public Assistance</i>	-71.43 (-1.627)	18.08 (0.382)	79.11 (1.732)	17.03 (0.642)
<i>Unemployment</i>	178.53 (3.319)**	-82.03 (-1.209)	25.97 (0.308)	52.21 (1.414)
<i>Over 18 who Vote</i>	-26.97 (-2.903)**	8.55 (0.841)	-419 (-0.600)	-0.46 (-0.611)
<i>Democrats in House</i>	-5.75 (-2.360)**	1.81 (0.586)	8.24 (3.456)**	2.69 (1.793)
<i>Coastal</i>	261.25 (1.654)	341.84 (1.966)*	457.83 (2.892)**	385.26 (4.082)**
Adjusted R ²	0.41	0.27	0.63	0.43

^a See Table 5. Dollar amounts are in 2000 constant dollars.

Table 12. Subsample Results for Federal Spending per Capita with Tenure^a

	1972–1980	1982–1990	1992–2000	1972–2000
Explanatory variables:				
<i>Tenured Representatives</i>	-1837.18 (-4.706)**	-560.84 (-0.823)	742.20 (1.195)	-1071.79 (-4.582)**
<i>Tenured Senators</i>	108.84 (1.328)	13.97 (0.088)	-90.32 (-0.820)	-12.95 (-0.216)
<i>House Tenure</i>	3754.49 (4.779)**	1232.82 (0.969)	-888.74 (-0.882)	2086.54 (4.892)**
<i>Senate Tenure</i>	-99.71 (-0.765)	-114.95 (-0.595)	283.45 (2.041)*	61.52 (0.709)
<i>Representatives</i>	2082.99 (6.144)**	824.37 (1.056)	-247.62 (-0.410)	1244.78 (5.115)**
<i>Senators</i>	144.20 (1.418)	226.89 (1.116)	510.49 (3.437)**	328.84 (4.254)**
<i>Per Capita Income</i>	-0.01 (-0.172)	0.00 (0.171)	-0.02 (-0.952)	0.00 (0.143)
<i>Rural</i>	-16.74 (-2.554)**	-15.22 (-2.326)**	-9.73 (-1.662)	-11.36 (-3.190)**
<i>College</i>	62.48 (0.901)	34.08 (0.370)	-77.62 (-0.881)	17.46 (0.393)
<i>Over 65</i>	-187.69 (-5.768)**	-73.01 (-2.009)*	-35.45 (-1.020)	-84.37 (-4.419)**
<i>Public Assistance</i>	-17.55 (-0.443)	-14.61 (-0.317)	48.03 (1.091)	9.48 (0.386)
<i>Unemployment</i>	182.07 (3.792)**	-14.49 (-0.223)	15.83 (0.196)	88.12 (2.628)**
<i>Over 18 who Vote</i>	-13.43 (-1.595)	7.85 (0.830)	-0.28 (-0.437)	-0.49 (-0.738)
<i>Democrats in House</i>	-3.39 (-1.525)	2.55 (0.843)	5.32 (2.263)*	1.58 (1.157)
<i>Coastal</i>	368.87 (2.606)**	580.15 (3.457)**	455.33 (2.813)**	460.09 (5.215)**
Adjusted R ²	0.51	0.21	0.23	0.43

^a See Table 5. Dollar amounts are in 2000 constant dollars.

Table 13. Subsample Results for Net Spending per Capita with Tenure^a

	1972–1980	1982–1990	1992–2000	1972–2000
Explanatory variables:				
<i>Tenured Representatives</i>	-2443.84 (-5.814)**	-472.98 (-0.630)	540.39 (0.814)	-1334.28 (-5.216)**
<i>Tenured Senators</i>	47.64 (0.540)	36.62 (0.208)	-26.03 (-0.219)	-28.78 (-0.439)
<i>House Tenure</i>	4937.46 (5.838)**	1101.16 (0.786)	-638.35 (-0.593)	2533.74 (5.433)**
<i>Senate Tenure</i>	4.02 (0.029)	-87.85 (-0.413)	252.40 (1.699)	95.98 (1.012)
<i>Representatives</i>	2397.19 (6.567)**	700.37 (0.815)	-282.96 (-0.438)	1371.21 (5.153)**
<i>Senators</i>	199.25 (1.819)	164.60 (0.735)	348.36 (2.156)*	320.14 (3.787)**
<i>Per Capita Income</i>	-0.26 (-6.766)**	-0.23 (-7.777)**	-0.31 (-12.737)**	-0.26 (-15.686)**
<i>Rural</i>	-12.77 (-1.809)	-8.97 (-1.245)	-5.72 (-0.889)	-7.23 (-1.856)
<i>College</i>	103.64 (1.388)	36.48 (0.360)	-13.16 (-0.136)	52.80 (1.088)
<i>Over 65</i>	-210.22 (-6.000)**	-78.93 (-1.972)*	-52.93 (-1.426)	-99.32 (-4.758)**
<i>Public Assistance</i>	-11.49 (-0.270)	3.80 (0.075)	54.84 (1.170)	22.70 (0.846)
<i>Unemployment</i>	135.43 (2.620)**	-101.78 (-1.424)	-23.28 (-0.268)	35.77 (0.975)
<i>Over 18 who Vote</i>	-19.19 (-2.117)*	10.14 (0.973)	5.40 (0.539)	-0.51 (-0.689)
<i>Democrats in House</i>	-2.64 (-1.105)	2.66 (0.798)	7.39 (2.942)**	2.62 (1.756)
<i>Coastal</i>	210.55 (1.381)	389.24 (2.106)*	453.31 (2.621)**	353.82 (3.667)**
Adjusted R ²	0.49	0.27	0.64	0.44

^a See Table 5. Dollar amounts are in 2000 constant dollars.