Do Small States Get More Federal Monies? The Myth of Overrepresentation in the US Senate*

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Abstract

We analyze the relationship between Congressional representation and federal budget allocation to the US federal states during the period 1978-2002. Using different spending categories, we investigate whether small states, which are typically overrepresented in the Senate, receive significantly more spending than the underrepresented large states. Contrary to existing studies, we find that defense and procurement spending are not influenced by overrepresentation. On the other hand, less manipulable spending categories, such as direct payments to individuals, grants and salaries, seem to be affected. However, once state-specific trends - largely due to population trends - are taken into account, apart from a small effect on defense spending, we do not find any further evidence of overrepresentation bias on federal budget allocation. Hence, our results run against the hypothesis of small state advantage in the distribution of federal monies.

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"*The equality of representation in the Senate is another point, which, being evidently the result of compromise between the opposite pretensions of the large and the small States, does not call for much discussion. (. . .)*"Madison, The Federalist Paper 62, February 27, 1778.

The US constitution mandates a different type of representation for the federal states in the two branches of Congress. Members of the House are assigned proportionally to population and regularly reapportioned in response to demographic changes. As for the Senate, the principle of equal representation prescribes that each state must be represented by two senators. In the intent of the founding fathers of the US constitution, the double representation principle should balance the interests of the small and big states. By holding a fixed number of senators independently of the population size, the less populous states prevail in the Senate, while the proportionality principle insures that the more populous ones receive more seats in the House . Furthermore, the reapportionment of the House was explicitly designed to correct under or overrepresentation which could potentially arise when the federal states are subject to different demographic patterns. However, should the reapportionment not be effective, other mechanisms have been devised to provide further checks and balances between the two Congressional bodies where the states are differently represented. In particular, in relation to risk of overrepresentation of the small states, Madison writes:

"The large States, therefore, who will prevail in the House of Representatives, will have nothing to do but to make reapportionments and augmentations mutually conditions of each other; (...) These considerations seem to afford ample security on this subject (...) Admitting, however, that they should all be insufficient to subdue the unjust policy of the smaller States, or their predominant influence in the councils of the Senate, a constitutional and infallible resource still remains with the larger States(...) . The House of Representatives cannot only refuse, but they alone can propose, the supplies requisite for the support of government. They, in a word, hold the purse (...)" (The Federalist paper 52).

In other words, should the mechanism of reapportionment fail to provide the big states with the appropriate representation, the House of representatives maintains proposal power

over the budget to counter-balance the preponderance of the small states in the Senate. Hence, according to the founding fathers of the US constitution, the combination of proportional and equal representation, together with the House proposal power on budgetary matters, should grant adequate consideration to the interests of all states, independently of their population size. Ansolabehere et al (2003) provide a formal model showing how the attribution of proposal power to the lower house might indeed counterbalance the malapportionement in the upper house leading to an equal distribution of per-capita government expenditure.[1]

Despite the theoretical appeal of those arguments, the current empirical literature provides large support for the existence of a small state advantage in the US federal budget allocation[2]. In particular, the pioneering work by Atlas et al. (1995), analyzing per-capita federal spending using biennial data between 1972 and 1990, finds a strongly significant relationship between per-capita representation in the US House and Senate and federal spending. Lee (1998), using the Bickers and Stein (1991) data on domestic outlays from 1983 to 1990, finds evidence of overrepresentation for non-discretionary distributive spending that are allocated via formulas produced by the political process. Hoover and Pecorino (2004), considering a different time period (1983-1999) and a broad range of federal expenditure, find a negative relationship between House representation per-capita and spending per-capita. But, consistently with Atlas et al. (1995), they find that representation in the senate is positively related with total per-capita outlays as well as with procurement, grants, wages and pensions. [3] Finally, Knight (2004) does not find strong evidence of Senate overrepresen-

[1] For an empirical investigation on the impact of the proposal power of individual congressional representatives, such as committee members, over projects spending at district level see Knight (2005).

[2] At district level, Ansolabehere et al. (2002) analyze the effect of unequal representation prior to the 1960's and the equalizing impact on state transfers to counties following the court-ordered redistricting in the 1960s.

[3] They acknowledge, however, that it is somehow surprising to find a strong over-representation effect also on spending categories that are not directly targetable to the states and therefore less manipulable.

tation on aggregate spending, but he does on earmarked projects: the effect is particularly strong if the earmark comes from the Senate. The actual process through which Senate overrepresentation could generate a bias in federal budget allocation might be related to the process of congressional bargaining. Since less funds are necessary to obtain the same increase in percapita expenditure in a smaller than in a larger state, senators who need to build winning coalitions to bring federal spending to their constituents will typically ask smaller states to enter the coalition to minimize the cost of buying political allies (Lee, 1998, Knight, 2004).

The evidence provided by existing studies rises some fundamental questions about the US bicameralism. According to the estimates of Atlas et al. (1995), in 1990 the difference in total real per-capita spending due to overrepresentation between the most overrepresented (Wyoming) and the most under-represented (California) states is equivalent to approximately one third of the total spending of Wyoming.[4] The findings of other empirical studies tend point in the same direction (Wright, 1974; Wallis, 1998).

Is small Wyoming really much more powerful than California because of Senate overrepresentation as current empirical investigations seem to suggest? If this is the case, should the equal representation principle within the Senate be addressed as a serious flaw of the US constitution?[5] In this paper we revisit the literature on overrepresentation to provide new evidence that runs against the hypothesis of small state advantage in the US budget allocation process and suggests that current constitutional rules may guarantee a fair representation of the interests of the US federal states. Two crucial aspects of the current literature deserve, in our view, particular attention. First, as shown by Atlas et al. (1995) and Hoover and Pecorino (2005), the effects of overrepresentation are found on spending categories such as direct payments to individuals, salaries and pensions, that should be less prone to political manipulation. Second, the evidence of any difference in federal spending in

[4] Atlas et al (2005) estimate that the difference is equal to 1148$ in 1990 constant dollars.

[5] For a critical view on Senate representation in the US constitution see Dahl (2002).

cross section regressions is weak (Lee, 1998; Knight, 2004) and studies finding a strong effect of overrepresentation (Atlas et al.1995, Hoover and Pecorino 2005, Larcinese et al. 2006) use fixed effect regressions where the overrepresentation effect is identified by the within state variation of percapita Senate representation due to population changes. Considering that US states may display very different demographic patterns, then state specific trends are likely to affect both the dependent variable (percapita federal spending) and the independent one (percapita congressional representation), implying that fixed effects regressions not accounting for those trends may be affected by omitted variable bias.

We address these two issues for the period 1978-2002, finding a number of new results. First, by replicating the regressions of previous studies on our data we find that spending categories such as procurement and defense are not affected by overrepresentation. This runs against previous findings (Atlas et al. 1995; Hoover and Pecorino, 2005). On the other hand, consistently with previous studies, we find that the impact of overrepresentation is strong for total federal expenditure, direct payments to individuals, salaries and grants. In other words, overrepresentation seems not relevant for spending categories that are more targetable at the state level (and therefore more prone to pressure by state representatives). On the contrary, overrepresentation is important in determining the allocation of theoretically less manipulable spending categories. We argue that these apparently contradictory results might be due to the omission of state-specific trends from the regressions. Our investigation shows that both spending per capita and the number of representatives per capita are subject to different trends in different states. Furthermore, the high correlation between the overrepresentation variable and the states-specific trends suggests that, by not including those trends, previous estimates might suffer from a substantial omitted variable bias.

Once we introduce state specific trends in the regressions, we find that the allocation of federal outlays to the states is not affected by the number of senators per capita. The same holds when we consider more disaggregated spending categories such as direct payments to individuals, grants, salaries and procurement. We find some evidence of overrepresentation in

the case of defense spending, although of very modest size. Introducing state-specific trends has instead very limited impact on the coefficients of other political variables commonly used in the literature, such as the partizan alignment between the president and the state governor (Hoover and Pecorino 2005, Larcinese et al. 2006). All together, our results suggest that, despite the disproportionate allocation of seats in the Senate, small and big states do not get significantly different shares of the federal pie in per capita terms.

1 Some puzzling results

Population size varies considerably across US states and so does per-capita Senate representation. Table 1 reports an index of Senate and House overrepresentation by state during the period 1978-2002. Under or overrepresentation is determined by comparison with a fair representation given by the ratio between the total members of the House (or Senate) and the total US population in a given year[6]. States are ordered by population (starting with the smallest) and it is clear that small states are substantially overrepresented in the Senate. In the House, however, this phenomenon is negligible and not correlated with the population size of a state. Table 1 also reports average federal spending per capita by state in the period considered, showing that there is no clear pattern linking Senate overrepresentation and spending. This can be seen graphically in Figure 1, where the states are ordered along the horizontal axis according to their average population in the period considered, while on the vertical axis we report average per-capita outlays. The graph shows again no clear relation

[6] More specifically, define pop_{st} as the population of state s in year t and $USpop_t$ as the total US population (in the 48 states considered) in year t. Then the overrepresentation index in year t for the senate is given by $\frac{2}{pop_{st}} / \frac{96}{USpop_t} = \frac{USpop_t}{48 * pop_{st}}$, while for the House is $\frac{hm_{st}}{pop_{st}} / \frac{432}{USpop_{st}}$, where hm_{st} is the number of House representatives of state s in year t and 432 is the total number of representatives when Alaska and Hawaii are excluded. A value of 1 means that the state representation is perfectly equal to the national average, while an index above (below) 1 means overrepresentation (underrepresentation). Table 1 reports state-level averages of this index for the period 1978-2002.

between population and per-capita expenditure.

In Table 2 we focus on Senate overrepresentation and present summary statistics for federal spending and real income. The most populous states, which are under-represented (index below 1), have substantially higher income per capita: the average difference between overrepresented and under-represented states amounts to $1,529 (in real 1983 terms). On the other hand, differences in outlays per capita are quite small ($ 76 per capita), suggesting that small states do not particularly benefit from federal largesse.[7] A t-test shows that the difference in income between the two groups is statistically significant while the difference in federal spending is not. These observations, that seem coherent with the argument of a fair representation of small and big states, appear clearly at odds with the findings of most empirical studies which, across different spending categories and for various periods, tend to show a strong advantage for states that are overrepresented in the Senate.

A well established procedure (Atlas et al., 1995) to estimate the effect of overrepresentation is to regress federal outlays on per capita representation (i.e. the ratio of the number of House or Senate members over the population per state). Focussing on Senate overrepresentation, this amounts to estimating the following equation:

$$\begin{aligned} FEDEXP_{st} &= \alpha_s + \beta_t + \gamma * SP_{st-1} + \boldsymbol{\theta}_1 Z_{st} + \epsilon_{st}, \qquad (1) \\ s &= 1, ...48; \quad t = 1978, ...2002; \end{aligned}$$

where $FEDEXP_{st}$ is real per-capita federal expenditure (outlays) in state s at time t, SP stands for *senators per capita*, and Z_{st} is a vector of socioeconomic and political control variables.[8]

[7] If outlays net of taxes are considered as in Atlas, the difference between under and over-represented states become larger. This is not surprising given that under-represented states are substantially richer. However, according to Atlas et al. (1995), overrepresentation does not have a statistically significant impact on taxation. Hence, if there is a small state advantage, we should see substantial differences in federal spending between under and overrepresented states.

[8] It is important to point out that there is a lag between the appropriation of federal funds and the moment

In Table 3 we report the results of Atlas et al. (1995) and Knight (2004), as well as our results obtained estimating equation 1 over the period 1978-2002. Similarly to Atlas et al. (1995) we find that the impact of senators per capita is large and statistically significant when state fixed effects are included. This result, however, disappears when the fixed effects are removed. This is also evident from yearly cross-section regressions (Tab. 4). These results are consistent with Knight (2004) who also finds a very modest impact of overrepresentation in cross-section regressions.

In Table 5, we report estimates of equation 1 (including state fixed effects and year dummies) using as dependent variable, respectively, total federal spending, direct payments to individuals, salaries, grants, defense, and procurement spending. While direct payments, salaries, and grants are all affected by overrepresentation, the number of senators per capita does not have a significant impact neither on defense[9] nor on procurement spending[10]. Table 6 reports estimates when we include further political controls that are likely to affect the distribution of federal outlays to the states[11]. These include the partisan alignment between

when funds are actually spent. This is relevant when estimating the effect of particular institutional and political variables, since current federal outlays have normally been appropriated in past budgetary years (Larcinese et al. 2006). Delays should therefore be taken into account by introducing lagged values for $SenatorsPercapita$ as well as for any other political variable, since past policy makers are responsible for current outlays.

[9] Our results are different from Atlas et al. (1995) who find a significant impact of senators percapita on defense. If we run our regression only for the period 1978-1990, we also find a significant effect. However, the significance disappears in the larger sample.

[10] Similarly to Hoover and Pecorino (2005) we find that the coefficient of over-representation in the procurement equation is positive and significant: this result, however, is not robust to clustering the standard errors at the state level.

[11] The rationale for introducing the political controls that we use can be found in a vast literature in both economics and political science. Representative papers include Lindbeck and Weibull (1987 and 1993), Dixit and Londregan (1996), Cox and McCubbins (1986 and 1993), McCarty (2000), Kiewiet and Krehbiel (2002), to cite just a few. The empirical literature that confirms the importance of using such controls is also vast. For an overview of both the theoretical and empirical literature on the political determinants of the US

the president and the majorities of the Senate and of the House, the partisan alignment between the president and the state governor, the closeness of the past presidential race, and the share of votes for the incumbent president in the last election. Table 6 shows that the results on the overrepresentation coefficient is quite robust to the variations in the specification used.

Tables 5 and 6 suggest that overrepresentation has no impact on defense and procurement spending, the variables that are more subject to political pressures. On the contrary, it appears to have a significant and strong effect on less manipulable spending categories like direct payment to individuals and salaries. Furthermore, these results crucially depend on the presence of state fixed effects. Hence, since our analysis does not reveal any noticeable cross section pattern, it seems appropriate do devote careful consideration to time variation.

2 Introducing state-specific trends

As Figure 2 illustrates, there exists a trend in per-capita expenditure over the entire period considered. It is legitimate to think that such trend may be substantially different from one state to another since spending adjusts slowly to demographic changes while population trends vary substantially across states. Hence, in Table 7a we report the estimated trends for federal outlays percapita over the period 1978-2002: these appear to be very different across states. In most states the trend is positive and significant at 5% or 1% levels. In three states (California, Nevada and Utah) the estimated trend is negative and not significant while New Hampshire and Missouri do not display statistically significant trends. For states where a positive trend is observed, the implied growth rate of federal outlays varies considerably, with estimated coefficient values in the range 173.18 - 25.91 (with a standard deviation of 45.38). This leads us to formulate the hypothesis that a state-trend variable is missing in equation (1). Also, the correlation coefficient between senator per-capita and the trend

federal budget allocation to the states see Larcinese et al (2006).

variable is almost always bigger than 0.95, which means that the state-trend missing variable introduces a strong bias on the estimate of the senators per-capita coefficient. The analysis of state trends for other spending variables is reported in table 7b and confirms that federal spending follows a very different time pattern across the US states.

When we re-estimate eq. (1) introducing state-specific trends, the results change dramatically. The coefficient of senators percapita becomes now insignificant (Table 8). At the same time the political alignment between president and governor, the only other political control with a significant impact (see Table 6), even if only for federal spending and direct payment to individuals, maintains its positive sign and is significant even when state specific trends are introduced. While, coherently with the results of a vast empirical literature, federal expenditure might be affected by political factors, our regressions do not show any significant small state advantage due to Congressional overrepresentation.

It is quite interesting to observe that now overrepresentation has a positive impact on defense spending. This effects is only significant at the 10% level and quite small in size: one standard deviation in senators per capita generates an extra transfer of approximately 58 $ per capita. This result is nevertheless coherent with the fact that defense spending, unlike direct payments to individuals and salaries, is among the most "manipulable" spending categories.

The introduction of state specific trends delivers a very different assessment of the impact of overrepresentation on federal budget allocation. While large states are under-represented in the Senate, still they are not penalized in the allocation of federal monies. Defense spending may constitute the only exception within this general picture: even in this case, the impact of Senate overrepresentation is small.

3 Conclusions

According to a number of studies, small states, that are overrepresented in the Congress, are the main beneficiaries of federal largesse. For obvious reasons, this phenomenon is claimed to be particularly strong for the Senate, where states are represented by the same number of senators independently of their population size. Senators will try to bring pork back in the state as a way to please their constituents and, therefore, increase their chances of re-election. Pork-Barrel politics typically requires the formation of coalitions within the Congress and, since small states are easier to satisfy than larger ones, their senators will typically be included in the winning coalitions (Lee, 2000; Knight, 2004).

These findings contrast with the thoughts of the founding fathers of the US constitution who envisaged the equal representation in the Senate with the objective of providing an instrument to counterbalance the power of big states in the House, rather than with the intent of favoring the small states . Theoretically, the proposal power of the lower house could indeed generate an equal distribution of federal expenditure even with a malapportioned upper house (Ansolabehere et al. 2003). Hence, the question arises of whether current constitutional rules provide a balance between the interests of the big and small states.

In this paper we have reconsidered congressional overrepresentation by focussing on the econometric specifications used in the existing literature. Evidence of small state advantage is usually found in regressions that include state fixed effects, and not in cross sectional studies. Although including fixed effects is crucial to avoid omitted variable problems, an identification strategy based on within state variation can be problematic, since the dynamics of malapportionement crucially depend on variations in the population size of the various states that typically display different demographic patterns with expenditure adjusting slowly. In particular, we find clear evidence of state specific trends simultaneously affecting the dependent variable (federal expenditure per capita) and the independent variable (senators per capita). This suggests that the overrepresentation effects found in the

current literature could constitute purely spurious correlations, and that to rule out this possibility we need to address the potential omitted variable bias problem by introducing state specific trends in the fixed effect specifications.

When we introduce state specific trends in our regressions, we do not find strong evidence of small state advantage due to overrepresentation. This result is rather robust, in the sense that it applies not only to aggregate federal expenditure (per-capita) but also to disaggregated categories such as procurement, grants, direct payment to individuals, and salaries. These findings help to provide an explanation for some of the contradictory findings of the current literature, such as the strong overrepresentation effect that has been found in non-manipulable budget categories like direct payments to individuals and salaries. The omission of state specific trends can be responsible for the substantial upward bias in the estimated coefficients. Once those trends are included we find that non-manipulable spending categories are not affected by overrepresentation. On the contrary we find some evidence of overrepresentation on defense spending, a clearly more manipulable budgetary item. The implied spending differentials are, however, considerably smaller than any effect found in previous studies.

Overall our results cast new light on the much criticized double representation system in the US Congress. Despite their clear advantage in one branch of Congress, small states do not receive disproportionately more federal spending. On the contrary, the current constitutional rules, by combining equal representation in the senate with house proportionality and proposal power on budgetary matters, seem to work effectively in assuring a fair allocation of federal monies across all the US federal states.

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Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Federal spending per capita	1200	3.076	0.607	1.795	5.681
Direct payments to individuals per capita	1200	1.533	0.341	0.449	3.326
Grants per capita	1200	0.516	0.170	0.231	1.387
Salaries spending per capita	1008	0.410	0.235	0.080	4.750
Procurement spending per capita	1008	0.484	0.364	0.089	2.340
Defense spending per capita	1200	0.539	0.364	0.061	2.511
Senators per capita (lagged)	1200	0.984	1.004	0.058	4.926
Share of votes for the president in the previous election	1200	0.546	0.075	0.344	0.780
Closeness (distance in percentage of vote between the winner and the runner up in the last presidential race)	1200	0.858	0.100	0.441	1.000
President-governor alignment: dummy variable equal to 1 when the party affiliation of the governor is the same of the President	1200	.3508	.4774	0	1
President-house alignment: dummy equal to 1 if a majority of state delegates in the House are from the same party of the President.	1200	.4308	.4954	0	1
President-senate alignment: dummy equal to 1 if both senators from a state are from the same party of the President.	1200	.5042	.5002	0	1
Income per capita	1200	13.951	2.519	8.601	24.069
Unemployment rate (%)	1200	5.972	2.105	2.200	18.000
State population (millions)	1200	5.197397	5.478277	0.425	35.116
aged (share of the population above 65)	1200	0.123	0.022	0.045	0.376
kids (share of the population aged 5-17)	1200	0.195	0.030	0.023	0.620

Note: Data are annual for the period 1978-2002 (for lagged variables the period is 1977-2001) and include all US states except Alaska, District of Columbia and Hawaii. Data for Salaries and Procurement are for the years 1982-2002. Economic variables are real (in 1983 terms) per capita and are taken from the Statistical Abstract of the United States and from the Bureau of Statistics. Political data are authors' elaborations of data from the Statistical Abstract of the United States.

Table 1: Average population, overrepresentation, and spending in the period 1978-2002

state	population (millions)	Senate overrepresentation	House overrepresentation	Federal spending per capita (real 1983 thousands USD)
WY	0.480	10.844	1.205	3.144
VT	0.558	9.305	1.034	2.726
ND	0.651	7.995	0.888	3.807
DE	0.677	7.692	0.855	2.731
SD	0.715	7.254	0.956	3.329
MT	0.836	6.210	1.097	3.340
RI	0.993	5.227	1.162	3.297
ID	1.080	4.838	1.075	2.862
NH	1.082	4.820	1.071	2.673
ME	1.204	4.310	0.958	3.212
NV	1.302	4.376	0.839	2.810
NM	1.553	3.364	1.041	4.437
NE	1.618	3.207	1.069	2.969
UT	1.812	2.904	0.896	2.738
WV	1.851	2.815	1.113	3.020
AR	2.419	2.146	0.954	2.856
KS	2.511	2.066	1.053	3.093
MS	2.639	1.966	1.092	3.249
IA	2.856	1.820	1.126	2.736
OR	2.942	1.772	0.945	2.635
OK	3.235	1.605	1.070	2.975
CT	3.260	1.592	1.061	3.632
CO	3.499	1.499	0.963	3.170
SC	3.523	1.477	0.985	2.897
KY	3.781	1.372	1.004	2.910
AZ	3.805	1.418	0.802	3.046
AL	4.121	1.259	0.979	3.227
LA	4.323	1.201	1.011	2.873
MN	4.439	1.170	1.040	2.617
MD	4.757	1.093	0.972	4.447
WA	4.945	1.060	0.961	3.383
WI	4.977	1.043	1.043	2.375
TN	5.017	1.036	1.013	3.080
MO	5.194	0.999	1.020	3.721
IN	5.671	0.915	1.036	2.440
MA	6.014	0.863	1.032	3.664
VA	6.199	0.840	0.970	4.595
GA	6.663	0.789	0.909	2.795
NC	6.803	0.767	0.971	2.504
NJ	7.826	0.663	1.015	2.793
MI	9.447	0.549	1.059	2.444
OH	10.978	0.473	1.078	2.652
IL	11.711	0.443	1.060	2.561
PA	11.978	0.433	1.084	3.054
FL	12.854	0.412	0.893	3.160
TX	17.447	0.300	0.917	2.695
NY	18.125	0.286	1.071	3.104
CA	29.102	0.180	0.944	3.176

Note: Column 1 reports state-level averages of population for the period 1978-2002, column 2 and 3 state-level averages of the overrepresentation index respectively for the Senate and the House for the period 1978-2002 and column 4 contains state-level averages of the federal spending percapita for the period 1978-2002. The overrepresentation index is the ratio between the state-quota of representatives and the respective state-quota of population: if the ratio is greater than 1 the state is overrepresented and vice-versa otherwise.

Fig. 1: Real spending per capita and state overrepresentation

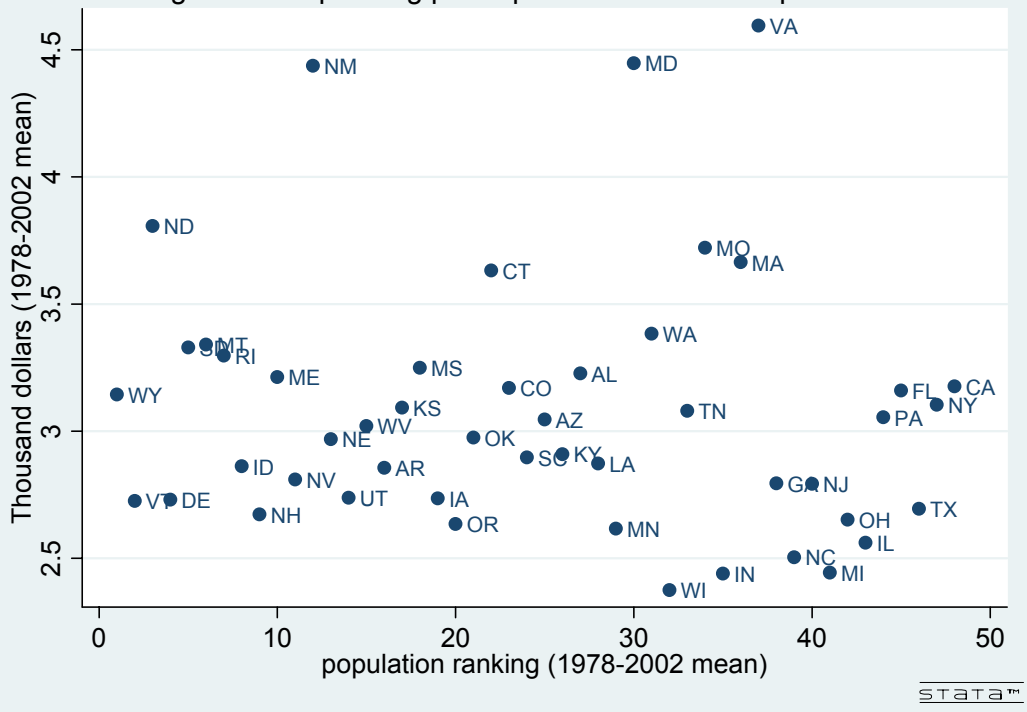

Table 2: Senate overrepresentation, outlays and income per capita (averages 1978-2002)

States	Number of states	Real outlays per capita	Real income per capita
Overrepresented states	33	$3,100	$13,473
Underrepresented states	15	$3,024	$15,002
difference		+$76	-$1,529
t-statistic		0.4844	-2.6645
P > | t |		0.6304	0.0106

Note: Using table 1, the states are divided into two groups, those with senate overrepresentation index below or equal to 1 (underrepresented) and those with senate overrepresentation index above 1 (Variables are in real 1983 terms).

Table 3: Federal outlays (real percapita) elasticity to Senate overrepresentation.

	Atlas et al., 1995	Knight , 2006	Our results	Our results
Senate overrepresentation	792.75***	0.0002**	687.81***	10.82
t-statistics	(8.66)		(7.08)	(0.14)
Senate elasticity		0.05	0.23	0.0035
Fiscal Years Considered	1972-1990	1995-2002	1978-2002	1978-2002
State fixed effects	YES	NO	YES	NO
Observations	484	400	1200	1200
R-squared	0.35	0.11	0.92	0.24

Note: Senate elasticity is computed dividing the overrepresentation coefficient by the ratio between the average federal outlay (real percapita) and the average number of senators per capita. The elasticity in Atlas et al. (1995) cannot be computed because no summary statistics are reported. The observations in Atlas et al. are on biennial basis.

Table 4: Cross-section analysis of overrepresentation.

	(1)	(2)
years	**senators per capita**	**t statistics**
1978	-0.0231	0.26
1979	-0.0118	0.16
1980	-0.0523	0.69
1981	-0.0185	0.25
1982	-0.1428	1.58
1983	-0.1104	1.28
1984	-0.0701	0.83
1985	-0.0531	0.52
1986	-0.0545	0.51
1987	-0.0415	0.37
1988	-0.0230	0.22
1989	-0.0080	0.09
1990	-0.0644	0.76
1991	-0.0165	0.18
1992	0.0159	0.18
1993	0.0089	0.10
1994	0.0255	0.26
1995	0.0428	0.56
1996	0.0317	0.43
1997	0.0710	0.75
1998	0.0437	0.52
1999	0.0825	1.01
2000	0.1217	1.20
2001	0.0805	0.65
2002	0.0371	0.24

Note: The first column reports the coefficient of senators per capita in yearly cross-section regression of the percapita federal outlay on the overrepresentation variable and socioeconomic controls (percapita income, unemployment, population, aged, kids). The second column reports absolute value of t statistics with robust standard errors.

Table 5: OLS regressions with state fixed effects and year dummies. Dependent variables: real federal outlays per capita

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	**federal spending (1978-2002)**	**direct payments to individuals (1978-2002)**	**grants (1978-2002)**	**salaries (1982-2002)**	**procurement (1982-2002)**	**defense (1978-2002)**
senators per capita	0.6878 (7.08)***	0.3077 (3.26)***	0.1564 (3.54)***	0.1177 (2.94)***	0.2010 (1.56)	0.0378 (0.70)
income	-0.0686 (2.14)**	-0.0311 (2.65)**	-0.0073 (1.02)	0.0034 (0.85)	-0.0614 (1.57)	-0.0511 (1.67)
unemployment	0.0009 (0.07)	0.0142 (2.58)**	0.0086 (3.03)***	-0.0027 (0.57)	-0.0176 (1.26)	-0.0223 (1.92)*
state population	-0.0744 (4.29)***	-0.0446 (3.33)***	-0.0108 (1.88)*	-0.0000 (3.56)***	-0.0000 (1.26)	-0.0229 (1.15)
% aged (above 65)	11.1753 (4.65)***	4.0450 (2.58)**	2.1572 (3.95)***	0.1904 (0.27)	2.7892 (1.47)	2.1624 (1.37)
% kids (5-17)	-5.0148 (4.01)***	-2.2115 (2.66)**	-0.8689 (2.96)***	0.1284 (0.36)	-1.5512 (1.81)*	-1.2254 (1.74)*
Constant	2.9499 (6.04)***	1.4899 (10.14)***	0.2206 (2.17)**	0.3926 (4.99)***	1.4142 (2.04)**	1.4763 (3.09)***
Observations	1200	1200	1200	1008	1008	1200
R-squared (within)	0.7491	0.8826	0.8390	0.0949	0.3343	0.3208

Note: In all regressions state fixed effects and year dummies are included. Robust t statistics in parentheses clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: OLS regressions with political controls. Dependent variables: real percapita outlays

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	**federal spending (1978-2002)**	**direct payments to individuals (1978-2002)**	**grants (1978-2002)**	**salaries (1982-2002)**	**procurement (1982-2002)**	**defense (1978-2002)**
senators per capita	0.6901	0.2973	0.1462	0.0903	0.2441	0.0600
	(6.65)***	(3.08)***	(3.44)***	(2.61)**	(1.68)*	(1.08)
president-governor alignment	0.0390	0.0228	0.0016	-0.0069	0.0230	0.0263
	(2.24)**	(1.95)*	(0.29)	(0.61)	(1.62)	(1.65)
president-senate alignment	-0.0146	-0.0021	0.0048	-0.0031	-0.0057	-0.0020
	(0.74)	(0.24)	(1.17)	(0.72)	(0.37)	(0.14)
president-house alignment	0.0188	0.0283	-0.0009	0.0117	0.0046	0.0226
	(0.67)	(1.57)	(0.12)	(1.10)	(0.20)	(1.06)
share of votes for the president	0.0790	-0.0093	0.0494	-0.0122	0.0087	-0.0234
	(0.38)	(0.10)	(1.06)	(0.11)	(0.07)	(0.16)
closeness (presidential election)	-0.1154	-0.1349	-0.1252	-0.1440	0.2040	0.2400
	(0.62)	(1.65)	(2.10)**	(2.00)*	(1.15)	(1.58)
income	-0.0725	-0.0343	-0.0104	-0.0016	-0.0544	-0.0456
	(2.26)**	(2.88)***	(1.48)	(0.34)	(1.32)	(1.43)
unemployment	0.0011	0.0140	0.0083	-0.0036	-0.0160	-0.0214
	(0.08)	(2.47)**	(3.13)***	(0.75)	(1.12)	(1.83)*
state population	-0.0734	-0.0433	-0.0097	-0.0000	-0.0000	-0.0248
	(4.15)***	(3.35)***	(1.96)*	(2.78)***	(1.47)	(1.37)
% aged (above 65)	11.5030	4.1058	2.2152	0.1902	2.8960	2.1484
	(4.75)***	(2.52)**	(3.86)***	(0.30)	(1.58)	(1.39)
% kids (5-17)	-5.1459	-2.2189	-0.9055	0.1271	-1.5813	-1.2011
	(4.07)***	(2.59)**	(2.99)***	(0.39)	(1.89)*	(1.73)*
Constant	3.4479	1.8983	0.5152	0.5986	1.1031	1.0714
	(5.88)***	(9.76)***	(4.20)***	(4.09)***	(1.39)	(1.88)*
Observations	1200	1200	1200	1008	1008	1200
R-squared (within)	0.7518	0.8844	0.8469	0.1013	0.3444	0.3378

Note: All regressions include state fixed effects and year dummies. Robust t statistics in parentheses clustered by state.* significant at 10%; ** significant at 5%; *** significant at 1%

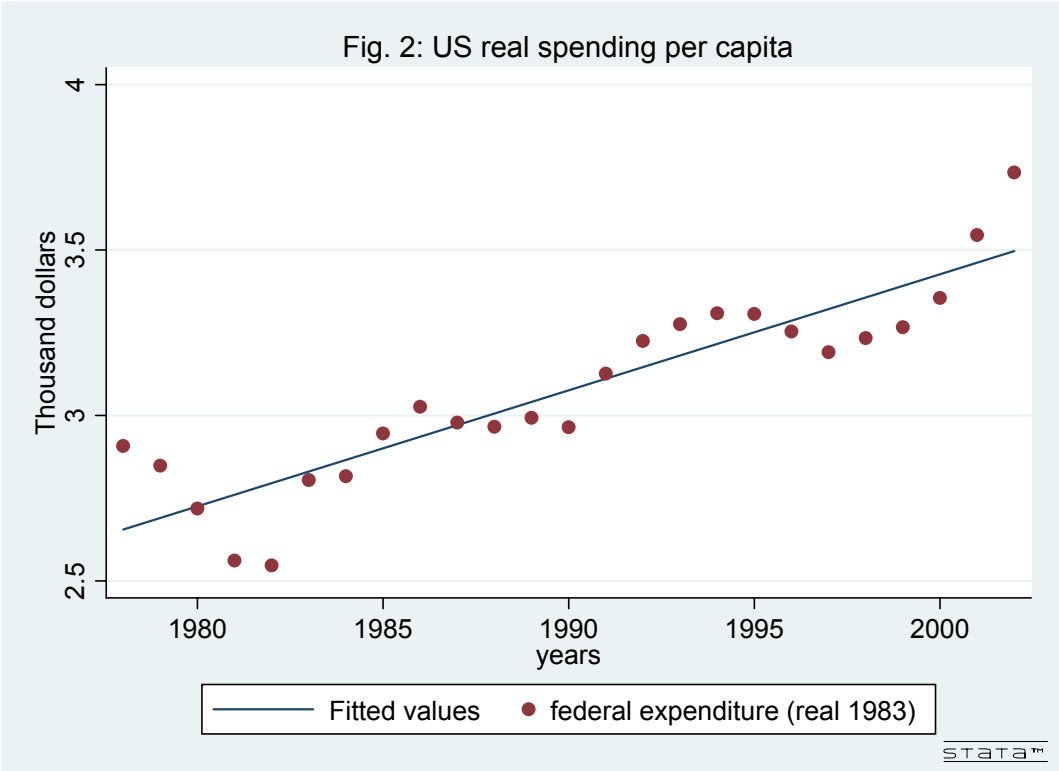
Fig. 2: US real spending per capita
Thousand dollars
2.5
3
3.5
4
1980
1985
1990
1995
2000
years
Fitted values
federal expenditure (real 1983)

Table 7a: Federal outlays (real percapita) and State Trends.

state	trend	t-statistic	correlation SP-year	state	trend	t statistic	correlation SP-year
	(1a)	(2a)	(3a)		(1b)	(2b)	(3b)
AL	120.460	(19.85)***	-0.978	NC	104.299	(20.75)***	-0.992
AR	83.540	(12.30)***	-0.935	ND	136.800	(5.93)***	0.734
AZ	51.260	(6.37)***	-0.996	NE	69.048	(5.49)***	-0.846
CA	-4.950	(0.51)	-0.979	NH	16.534	(1.68)	-0.972
CO	54.360	(3.11)***	-0.973	NJ	77.690	(8.56)***	-0.981
CT	-25.910	(3.06)***	-0.906	NM	74.700	(5.38)***	-0.995
DE	59.067	(8.77)***	-0.998	NV	-18.119	(1.3)	0.997
FL	74.530	(9.18)***	-0.992	NY	77.253	(9.87)***	-0.934
GA	68.625	(6.66)***	-0.998	OH	71.913	(11.46)***	-0.946
IA	101.835	(8.13)***	-0.145	OK	120.151	(22.97)***	-0.594
ID	71.785	(6.82)***	-0.943	OR	71.218	(12.35)***	-0.972
IL	83.997	(6.48)***	-0.886	PA	108.972	(13.66)***	-0.899
IN	70.029	(10.60)***	-0.937	RI	112.914	(11.47)***	-0.883
KS	28.067	(2.88)***	-0.982	SC	86.215	(13.45)***	-0.997
KY	134.800	(11.47)***	-0.892	SD	116.562	(10.16)***	-0.943
LA	131.897	(12.84)***	-0.145	TN	93.711	(11.70)***	-0.975
MA	52.359	(4.49)***	-0.954	TX	78.178	(13.44)***	-0.989
MD	116.004	(11.39)***	0.992	UT	-5.519	(0.55)	-0.988
ME	111.401	(7.08)***	-0.958	VA	105.843	(8.20)***	-0.997
MI	75.572	(10.88)***	-0.983	VT	89.205	(9.15)***	-0.994
MN	39.232	(5.11)***	-0.99	WA	18.656	(2.33)**	-0.994
MO	24.883	(1.68)	-0.983	WI	60.637	(11.46)***	-0.978
MS	98.732	(8.62)***	-0.893	WV	173.184	(22.39)***	0.825
MT	142.636	(13.84)***	-0.846	WY	132.210	(14.42)***	0.339

Note: Column 1 reports the trend coefficient of the federal spending regression. Column 2 reports the t-statistics of the coefficient. Column 3 reports the correlation coefficient between senators per capita and the trend variable. Absolute value of t statistics in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%

Table 7b: State trends by spending categories (real percapita:1978-2002)

State	Direct Payments	Grants	Salaries	Defense	Procurement
AL	0.0284***	0.0104***	-0.0102***	0.0055**	0.0055
AR	0.0262***	0.0103***	-0.0016*	-0.0121***	-0.0154***
AZ	0.0061	0.0097***	-0.0061***	-0.0183***	-0.0169***
CA	0.0115*	0.0106***	-0.0114***	-0.0524***	-0.0493***
CO	0.0114*	0.0029	-0.0070***	-0.0046	-0.0081
CT	0.0274***	0.0163***	-0.0004	-0.0811***	-0.0926***
DE	0.0177**	0.0042	-0.0026	-0.0168***	-0.0201***
FL	0.0088	0.0068***	-0.0041***	-0.0076***	-0.0131***
GA	0.0142**	0.0030	-0.0044***	-0.0059	-0.0058
IA	0.0315***	0.0098***	0.0019*	-0.0016	-0.0016
ID	0.0154**	0.0067***	-0.0026***	0.0055***	0.0003
IL	0.0132**	0.0064***	0.0000	-0.0043***	-0.0017
IN	0.0299***	0.0086***	-0.0010	-0.0175***	-0.0163***
KS	0.0229***	0.0081***	-0.0028	-0.0347***	-0.0346***
KY	0.0241***	0.0125***	-0.0015	0.0068***	0.0092
LA	0.0386***	0.0182***	0.0005	-0.0085***	-0.0132***
MA	0.0250***	0.0161***	-0.0003	-0.0511***	-0.0474***
MD	0.0228***	0.0092***	-0.0009	-0.0206***	-0.0084
ME	0.0183**	0.0136***	0.0034**	-0.0041	-0.0079
MI	0.0121*	0.0060***	0.0005	-0.0100***	-0.0084***
MN	0.0133**	0.0057***	0.0020*	-0.0185***	-0.0196***
MO	0.0216***	0.0135***	-0.0027*	-0.0422***	-0.0423***
MS	0.0325***	0.0138***	-0.0021***	-0.0160***	-0.0182***
MT	0.0383***	0.0131***	-0.0001	0.0036**	0.0045**
NC	0.0211***	0.0123***	-0.0030**	-0.0016	-0.0011
ND	0.0783***	0.0238***	0.0002	-0.0038	-0.0048*
NE	0.0296***	0.0113***	-0.0040**	-0.0002	-0.0012
NH	0.0078	0.0090***	-0.0167***	-0.0347***	-0.0226***
NJ	0.0231***	0.0071***	-0.0025*	-0.0157***	-0.0132***
NM	0.0158**	0.0181***	-0.0082***	-0.0094***	-0.0237**
NV	0.0095	-0.0045**	-0.0107***	-0.0026	-0.0398***
NY	0.0192***	0.0189***	0.0004	-0.0276***	-0.0259***
OH	0.0158**	0.0106***	-0.0003	-0.0134***	-0.0253**
OK	0.0261***	0.0113***	-0.0025*	0.0039**	0.0039***
OR	0.0117*	0.0058**	-0.0123	0.0008	-0.0028**
PA	0.0245***	0.0113***	-0.0018	-0.0088***	-0.0065***
RI	0.0201**	0.0166***	0.0020**	-0.0099***	-0.0133***
SC	0.0233***	0.0118***	-0.0151***	-0.0050	-0.0030
SD	0.0413***	0.0144***	-0.0025	0.0007	0.0057**
TN	0.0234***	0.0125***	-0.0058***	-0.0005	-0.0074*
TX	0.0178***	0.0121***	-0.0040***	-0.0159***	-0.0098***
UT	0.0060	0.0041**	-0.0134***	-0.0310***	-0.0249***
VA	0.0141*	0.0031	-0.0186***	0.0005	0.0234**
VT	0.0154**	0.0120***	0.0047***	-0.0045	-0.0077**
WA	0.0122*	0.0089***	-0.0053	-0.0297***	-0.0377***
WI	0.0150**	0.0049**	0.0009	-0.0060***	-0.0071***
WV	0.0292***	0.0199***	0.0072***	0.0034***	0.0056***
WY	0.0333***	0.0202***	0.0027**	0.0040**	-0.0007

Note: Each row reports the coefficient of an OLS regression by state of five spending categories (direct payments, grants, salaries, defense and procurement) on a trend variable. A constant is also included in the regressions. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: OLS regressions. Dependent variables: federal outlays per capita.
With state fixed effects, year dummies and state-specific trend

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	**federal spending (1978-2002)**	**direct payments to individuals (1978-2002)**	**grants (1978-2002)**	**salaries (1982-2000)**	**procurement (1982-2002)**	**defense (1978-2002)**
senators per capita	0.1260	-0.0690	-0.0859	0.0597	0.2652	0.1607
	(0.76)	(0.84)	(1.16)	(0.75)	(1.16)	(1.69)*
president-governor alignment	0.0295	0.0257	0.0006	-0.0101	0.0173	0.0091
	(1.96)*	(1.88)*	(0.13)	(0.75)	(1.27)	(0.69)
president-senate alignment	-0.0123	0.0085	0.0023	-0.0046	-0.0028	-0.0040
	(0.75)	(1.09)	(0.62)	(0.60)	(0.27)	(0.38)
president-house alignment	0.0107	0.0147	-0.0047	0.0121	0.0003	0.0116
	(0.43)	(1.14)	(0.89)	(0.77)	(0.02)	(0.64)
share of votes for the president	0.1835	0.1068	0.0606	-0.0418	-0.0585	0.0196
	(1.10)	(1.39)	(1.76)*	(0.38)	(0.60)	(0.20)
closeness (presidential election)	0.1586	-0.0893	-0.0301	-0.0078	0.0155	0.1040
	(0.80)	(0.74)	(0.71)	(0.17)	(0.13)	(0.81)
income	0.0003	-0.0088	-0.0037	0.0022	0.0039	0.0297
	(0.01)	(0.55)	(0.65)	(0.28)	(0.21)	(1.54)
unemployment	0.0039	0.0096	0.0025	-0.0032	-0.0070	-0.0098
	(0.41)	(2.17)**	(1.54)	(0.45)	(0.95)	(1.62)
state population	-0.1332	-0.0660	-0.0587	-0.0000	-0.0000	-0.0000
	(1.72)*	(1.48)	(2.99)***	(0.31)	(2.38)**	(0.58)
% aged (above 65)	6.5434	3.6533	1.2706	0.1002	-1.8112	-0.7783
	(2.11)**	(1.66)	(1.81)*	(0.32)	(0.92)	(0.57)
% kids (5-17)	-3.1297	-2.0243	-0.5903	0.0243	0.5905	0.2510
	(2.09)**	(1.90)*	(1.75)*	(0.16)	(0.66)	(0.40)
Constant	-98.1761	48.5761	-21.2577	12.3948	-37.6706	-25.7722
	(6.45)***	(4.79)***	(7.63)***	(4.14)***	(3.94)***	(3.37)***
Observations	1200	1200	1200	1008	1008	1200
R-squared (within)	0.8363	0.9408	0.9109	0.1370	0.6629	0.6501

Note: All regressions include state fixed effects, year dummies and state-specific trends. Robust t statistics in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%