Political Determinants of the Flow of Federal Dollars to US States

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Abstract: While federal spending in general may be responsive to considerations of per capita representation, all federal spending is not the same. In particular, some types of federal spending are more discretionary than others. This paper seeks to determine which categories of federal spending are more sensitive to state-overrepresentation. We find that per capita representation affects overall federal spending, non-defense spending and direct payments from the government to individuals. On the other hand, per capita representation does not affect defense spending, procurements, grants, and salaries and wages. This is comforting in that it suggests that these categories of federal spending are somewhat more insulated from influence peddling by members of Congress and that grant awards and procurement procedures are likely to make choices based on the merits.

Introduction

An advantage of owning land in rural areas is that the federal government will sometimes pay you *not* to grow food on that property. Throughout the history of the United States, agriculture has become a declining industry. As agricultural technology improves, less farmers can produce many more crops. But, even though farmers today represent a negligible portion of the American workforce, farm subsidies have remained constant or grown in recent decades (Cohen, 2006). Farm subsidies represent the most extreme example of a political fact often taken for granted but not often studied: that small states, which are overrepresented in the United States senate and in Presidential elections, receive more federal dollars. This paper will examine the degree to which this is true, and what types of federal spending this small-state advantage explains.

When Americans cast their vote for a presidential candidate, whether they know it or not, they are not, in fact, voting directly for their preferred candidate. They are voting for an "elector" who will—almost always—vote for their candidate. The Electoral College system, although largely unknown to the American electorate whom it governs, is not particularly complicated. The winner of the popular vote, in almost every state, receives all of that state's electors. The number of electors a state gets is equal to the size of its congressional delegation. Because states, regardless of size,

receive a minimum of three electors (as a result of their two senators and one representative) smaller states receive a disproportionately large share of the vote.

From the perspective of large(r) states, this creates an unfair system—one not quite built on taxation *without* representation, but built on taxation without *equal* representation. The question is: are smaller states able to exploit this electoral advantage by obtaining more federal dollars? The answer, according to both a knee-jerk observation and the available scholarly literature, is "yes". Larcinese et al. (2007) finds that, "[S]mall states, that are overrepresented in the Congress [and, therefore, in the Electoral College], are the main beneficiaries of federal largesse."

Knight (2004) and Larcinese et al. (2007) confirm a small state advantage Knight (2004) contends that, "relative to the state delegations in the U.S. House, small population states are provided disproportionate bargaining power in the U.S. Senate." His conclusion was that senate earmarks are the reason for the small state advantage in the federal budgeting process.

The literature on the subject of the relationship between overrepresentation and federal spending focuses exclusively on the relationship between and within the two branches of Congress. For example, some of the hypotheses floated for the disproportionately large federal expenditure in small states include, Congressional committee assignments (Ray (1980) Johnson (1979)), "vulnerability" of Representatives

(Lazarus (2009) Levitt et al. (1997)), and the "economic interests" of a Congressperson's constituents (Dennis (2008)).

Few papers, however, take into account the effect of the executive branch on federal spending. Anecdotally, we know this to be ridiculous. For example, we know that the wars in Iraq and Afghanistan were driven in large part by the administration of George W. Bush. Of course, those who believe that Congress is responsible for federal spending would argue that Bush's role in state-specific spending prerogatives was mostly limited. Instead, the extent to which Congress controls spending may depend on the spending category.

While federal spending in general may be responsive to considerations of per capita representation, all federal spending is not the same. In particular, some types of federal spending are more discretionary than others. For instance, the allocation of defense spending across US states may be constrained by strategic considerations and the location of key defense contractors. Grants, similarly, are sometimes awarded through a competitive process that contains discretion. On the other hand, salaries and wages, procurements, direct payments to individuals are, to varying degrees, determined by a Congressional process that is more discretionary. This paper seeks to determine which categories of federal spending are more sensitive to state-overrepresentation.

This paper does not seek to determine whether states receive more federal dollars as a result of their advantage in Congress or as a result of their overrepresentation in presidential elections. That is for another paper. But, the two are, by definition, related. And this paper will examine how overrepresented states fare in the federal expenditure game generally, without opining as to which branch of government holds more power in the federal budgeting process..

Literature Review

The allocation of federal funds is always political. Schiller (1999, 26) notes that there are two things that determine discretionary federal expenditure: policy and demographics. The question is: does this result in an advantage for certain regions? And, is it consistent over time? Morgan (1996) contends that geographic disparities in the allocation of funds are stable. The federal government has many different spending priorities, including the primary distinction between "mandatory" and "discretionary" spending. As we see can see from Fig. 1, even within the subsets of discretionary and mandatory spending there are many different types of federal spending.

An administration has the ability to pander much more effectively with certain types of federal spending. For example, it is much more difficult to allocate funds politically from means-tested programs, or entitlement programs generally, because the requirements for such programs are objective.

This paper is based on the notion that there are winners and losers in the federal budgeting process. Americans all pay a federal income tax based on their earnings. Yet, the return from those taxes, in the form of federal-state transfers, is inherently unequal. Previous scholars have found basic geographic differences in federal funds (Johnson (1979), Lazarus (2009), Morgan et al. (1996), Schiller (1999)). Though different methodologies can obtain different results, as a generality, the heavily populated areas of the country are "losers" when it comes to per-capita federal spending. For instance, Morgan (1996) notes that the less densely populated mountain states and the Pacific region are big winners, and the North Central and Northeastern states are among the biggest losers.

Though geographic differences in federal spending are noted, both in political and academic circles, the available literature on the subject of federal expenditure does not offer state-disproportion in presidential elections as a cause of federal spending. It is worth noting that the calculus for the executive differs from the legislature. The legislator seeks to direct as much money as possible to his home state or congressional district. The president, however, wants to maximize electoral votes in the next election. Thus, in addition to the number of electoral votes, the president must decide if the state is winnable in the next election. That is, 'is the state a "swing" state?'[1]

[1] The definition of a "swing" state is ambiguous and subjective even in the mundane world of political punditry that created the term. And, even where it is easier to calculate, for a specific presidential election, there is often disagreement about what constitutes a swing state. For example, should a state's status as a swing state be determined by the results of the election, or by poll results a given period of time before the election? In an election where the winner obtains a significantly larger majority of electoral votes than the 270-vote threshold, should swing states be the states where the poll (or result) was closest to a 50-50 split or should swing states be the states that put the winner above the threshold. The representation variable included in this paper should not be affected by the lack of a swing state variable, because, all other things equal, presidential candidates should still pander to overrepresented states. For these reasons, this paper does not include a "swing state" dummy variable.

Because of the endless possible explanations for federal spending practices, nearly every piece of literature on the subject advances an entirely different, yet plausible, explanation of spatial differences in federal expenditure. Lazarus (2009), for example, advances the idea that House committee assignments are responsible for the allocation of federal funds. This is based on the idea that a congressman can steer funds to their district in the "area" of the federal budget that is controlled by their committee. Similarly, another theory posits that money flows into the districts of those electorally vulnerable members that the party wishes to protect. (Levitt 1997). The analysis of the data confirms that the districts of vulnerable members receive more money *only* when the congressperson is in the majority party. (Lazarus 2009, 1060).

The reason why committee assignments represent a good alternative to the state-disproportion voting is that Congress has the constitutional "power of the purse," unlike the president, or the president's administration. Johnson (1979, 383) notes that House Legislative Committees control Pork-Barrel projects. In modern politics, however, the president controls the priorities, spending and otherwise, of his party.

Another plausible explanation for federal spending disparities is that where government bureaucracies are largest, more funds are allocated. There are two reasons why we would expect there to be a positive correlation between size of a bureaucracy and share of the total federal outlay that it receives. Firstly, and perhaps less significantly, the bureaucracy—especially the salaries of the bureaucrats—needs to be funded. Secondly, bureaucrats will naturally be inclined to direct funds to their home state. The research on the subject confirms that there is, "[S]elf-aggrandizing behavior of government bureaucracies." (Morgan 1996, 326).

Data and Methods

To measure the disproportion in states' votes I have used a formula that produces a "Representation" number for each state. The Representation number can be thought of as the number of votes that a person gets relative to the national average. For example, New Jersey's Representation is approximately (for a given year) .93. Meaning that New Jersey voters receive 93% of an "average" vote.

The formula for Representation is: (total population divided by total electors) divided by (state population divided by a state's electors) for a given year. Or, more simply, the formula for Representation is the average number of people per elector divided by a state's actual number of people per elector. The expenditure (dependent) variables in this paper are for the years 1982, 1992, and 2002. The Representation variable is calculated using census data, for the years 1980, 1990, and 2000. Therefore, Representation will also be referred to as Replag2.

Besides Replag2, three other independent variables were used in this paper: Whitelag2, Voting, and GDP. Whitelag2 is the percent of non-Hispanic Caucasians in a state. This variable is also lagged two years because it was calculated with census data.

Voting is the percentage of the voting eligible population that voted in the last presidential election. It is lagged 2 years, 4 years, and 2 years, respectively, for the three years studied, reflecting the fact that presidential elections were held in 1980, 1988, and 2000. GDP is the inflation-adjusted (2005 dollars are used) per-capita gross domestic product of a state.

GDP, along with all dependent variables used, had to be normalized. For each result we subtracted the yearly average from the observation so that the results would not be skewed by growth over time.

The purpose of this paper is to determine if, and to what extent, Representation and the other independent variables explain different types federal spending. A rudimentary political analysis predicts that a higher Representation means more per capita dollars, because overrepresented states seek to maximize the electoral advantage. To some extent, this concept is accepted as fact in political circles; it is widely said—or at least thought—for example, that ethanol's only political support stems from the fact that Iowa—and its corn-growing population—hold the first-in-the-nation caucuses for both major political parties.

It is in the interest of presidential candidates to offer—and give—more to states with a higher Representation, all other things equal. This paper analyzes the extent to which this actually occurs. There are a number of ways of analyzing the extent to which the federal government favors smaller states. All of the dependent variables will be some measure of federal expenditure into the states.

Results and Analysis

To determine the impact of per-capita representation across different categories of federal spending, we ran seven fixed-effects regressions, each using all four independent variables, and one of the seven dependent variables. Each of the dependent variables measured some type of federal spending: Per Capita, Defense, Non-Defense (Nond), Direct Payments to Individuals (Direct), Procurements (Procure), Grants to State and Local Governments (Grants), and Salaries and Wages (Sal).[2]

[2] Shortened names for variables (in parentheses) are used interchangeably throughout this paper.

In addition, a pair-wise correlation was run among the independent variables to test for collinearity. The highest correlation was .5252 between Whitelag2 and Voting. This is not unexpected, as minorities tend to vote at lower rates. The remainder of the correlation coefficients was relatively low.

The results of the seven regressions, show that GDP was significant for every category of federal spending, except, curiously, for direct payments to individuals.[3] Representation was statistically significant in four of the seven regressions (Per Capita, Non-Defense, Direct Payments to Individuals, and Grants). The three regressions where Representation was not significant, Defense, Procure and Sal, are three variables we would expect to be less coordinated with the whims of politicians. Defense and Procure are especially non-political, because both defense contracts and procurements are very complicated expenditures involving a lot of entrenched interests.

Table 2 shows us the coefficients and standard deviations of each variable. The first regression, Per Capita, shows that a one standard deviation increase in Representation causes per capita federal spending to increase by about $1000. A one standard deviation increase (relative to the mean) for per capita GDP results in a decrease in Per Capita by about $300.[4] Per Capita contains all categories of federal spending and therefore the results of its regression are a good basis for comparison for subcategories of federal spending.

Defense spending is a unique category of spending, with many interconnecting factors that make it difficult to analyze. The location of certain defense contractors and influential

[3] Defined, for the purposes of this paper as being significant at the 10% level, meaning that it has a p-value of 0.1 or less.
[4] This approximated value excludes the outlier of Alaska for year 1982 only.

congressman and other difficult-to-quantify political issues are more likely to influence defense spending than Replag2. Therefore, Non-Defense, the variable which includes all federal expenditure into states except for defense spending, becomes an excellent indicator of what we would expect Representation and GDP to influence. Indeed, both Replag2 and GDP achieved significance at the .01 level; actually, both also achieved significance at the .001 level.

A one standard deviation increase in Replag2 results in a more than $750 increase in non-defense spending. That increase is less than the amount for Per Capita, meaning that changes in Representation have a greater effect for total per capita federal spending than for just non-defense spending. The only other variable besides GDP and Replag2 to achieve significance was Voting, which only achieved significance once, when regressed on Direct. The times where GDP and Replag2 were significant, by contrast, can be explained with a coherent story—GDP was usually more significant, and, for both variables, their significance was increased, generally, in tandem, for certain variables.

Replag2 also had a significant effect on Direct Payments to Individuals, unlike GDP. The estimated coefficient indicates that a one standard deviation increase in Replag2 results in an increase of over $450 in Direct. What is interesting about this is that Voting achieved significance in this regression, but that its sign was the opposite of Replag2. In other words, both Representation and Voting have a very significant impact on Direct, but they affect it in opposite ways. GDP, which achieved significance in every other regression, did not achieve significance when regressed on Direct.

Direct Payments to Individual presents the most puzzling results of all the regressions. Beyond the fact that voting achieved such a high significance ($p = .002$), it was the only

regression where Replag2 was significant and GDP was not. (And, incidentally, it was also the only regression where Replag2 achieved a greater degree of significance than GDP. Though it should be noted that both Representation and GDP achieved an equal .001 significance in both Per Capita and Non-Defense regressions.) The degree of significance amongst the independent variables is noteworthy because Direct Payments to Individuals is not something that logic dictates could be influenced by Voting or Representation. Furthermore, the vast majority of direct payments from the federal government to individuals is in the form of Social Security, which is a relic of New Deal-era politics. A one standard deviation increase in voting results in a decrease of almost $200 in Direct.

We may explain this result by noting that the poor are more likely to receive direct payments than the rich and the poor tend to vote at lower rates. This is not an unreasonable possibility as receiving direct federal aid is generally correlated with lower incomes and lower income is general associated with lower voter participation. Another possible reason is that while Social Security may be relatively stagnant in the formula used to determine payouts, a smaller minority of Direct Payments to Individuals—such as farm subsidies and food stamps—are among the most discretionary types of federal expenditure.

Finally, Replag2 was not significant in Defense Procurements, and Salaries and Wages. This is comforting in that it suggests that these categories of federal spending are somewhat more insulated from influence peddling by members of Congress and that procurement procedures, defense contracting, and federal employment are choices that are more likely based on their merits.

Conclusion

Like other works before this, this paper confirms an advantage for low-population states in the federal budgeting process. Our results show that overrepresented states receive more federal monies. However, the effect of representation on the distribution of federal funds varies within the type of federal spending.

GDP appears to the best determinant of federal expenditures into states, with a negative coefficient—meaning that "richer" states do worse in federal budgeting game, which is what we expect. The reason for this is that, generally, federal dollars are appropriated based on "need." Programs such as Social Security, Medicaid, and Medicare, are skewed toward the less affluent.

This paper differed from other papers of its kind by analyzing varying types of federal expenditure. And within these results we found the most curious data. As mentioned above, Direct produced the most significant results, despite being dominated by Social Security. Contrarily, Defense and Procure—which are types of federal spending that are appropriated based on a case-by-case basis—produced the least significant results.

Politics is a tremendously complicated subject. And for this reason it would be impossible to capture all of the politics involved the federal budgeting process. The reason why certain categories of federal expenditure were explained so well in this paper (Direct Payments to Individuals and Non-Defense Spending), while some others were not as well explained (Procurements and Defense Spending) is that the independent variables chosen for this paper explain only a portion of a larger political story. The allocation of Procurements and Defense monies, for example, is a highly complicated and individualized process that involves lawyers, lobbyists, and local concerns. Some other independent variables that could be considered for

future regression are influence in Congress, whether a state is a “swing” state, and the size of a state’s government bureaucracy.

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Table 1 – Definition of Variables

Per Capita	Total Per Capita Federal Spending for Every Category For State i in Year t
Defense	Per Capita Defense Spending Only for State i in Year t
Non-Defense	Per Capita Non-Defense Spending Only for State i in Year t
Direct Payments	Per Capita Direct Payments to Individual People for State i in Year t
Procurements	Per Capita Procurement Transfers From the Federal Government to State Governments for State i in Year t
Grants	Per Capita Grants to State and Local Governments for State i in Year t
Salaries and Wages	Per Capita Salaries and Wages Payments from the Federal Government for State i in Year t
White-lag2	Percentage of the Population that is non-Hispanic white for State i in Year t *
Voting	Percentage of Voting Eligible Population that voted in the previous presidential election for State i in Year t **
Representationlag2	The Percentage of an Average vote that an Individual Receives in a Given Presidential Election for State i in Year t * ***
GDP	In 2005 Dollars, Per capita for State i in Year t

Variables contain values for all 50 states
All monetary variables are adjusted for inflation and normalized so that they do not pick up real growth over time. They were obtained via the Statistical Abstract of the United States and the Department of Commerce.

*Variable is lagged two years, reflecting the fact that census data is used

** For the three years being studied, 1982, 1992, and 2002, the previous presidential elections were 1980, 1988, and 2000, respectively. This data was obtained from elections.gmu.edu.

***The formula used for population divided by total electors) divided by (state population divided by a state's electors). Or, the average number of people per elector divided by a state's actual number of people per elector.

Table 2a - Means and Standard Deviations - 1982

Dependent Variable	Mean	Standard Deviation
Per Capita	2490.82	604.9827
Defense	397.6	279.0368
Non-Defense	1015.56	160.3159
Direct Payments	662.34	88.25834
Procurements	297.08	226.3974
Grants	227.12	77.65824
Salaries and Wages	214.02	182.2892
Independent Variable		
White-lag2	85.484	11.76424
Voting	0.5618	0.0739468
Representationlag2	1.314354	0.531845
GDP	25950.22	12072.26

Table 2b - Means and Standard Deviations - 1992

Dependent Variable	Mean	Standard Deviation
Per Capita	4591.72	786.5441
Defense	633.7	442.1696
Non-Defense	2873.86	397.3277
Direct Payments	1783.58	233.9071
Procurements	505.46	340.1199
Grants	558.28	149.5834
Salaries and Wages	521.26	342.7899
Independent Variables		
White-lag2	83.854	11.79993
Voting	0.547	0.0622782
Representationlag2	1.298854	0.4993176
GDP	30599.63	5655.944

Table 2c - Means and Standard Deviations - 2002

Dependent Variable	Mean	Standard Deviation
Per Capita	6852.3	1388.385
Defense	899.44	691.3126
Non-Defense	5412.7	973.2288
Direct Payments	1385.68	482.0658
Procurements	806	624.5049
Grants	1432.5	550.1038
Salaries and Wages	674.84	394.6291
Independent Variable		
White-lag2	75.794	14.90913
Voting	0.559	0.0650667
Representationlag2	1.302401	0.5263475
GDP	37689.53	6685.192

Table 3a – Regression Results

Regression	1	2	3	4
Variable	Per Capita	Defense	Non-Defense	Direct Payments
Whitelag2	8.867408	.793735	5.521719	3.358536
	(7.649035)	(3.726751)	(6.593808)	(3.927177)
Voting	-291.939	1369.917	-1251.85	-2901.008
	(1745.934)	(850.6511)	(1505.072)	(896.3996)***
RepLag2	2065.68	12.4925	1508.579	916.44
	(462.8923)***	(225.5296)	(399.0337)***	(237.6587)***
GDP	-.0485022	-.0116245	-.0339677	-.0034649
	(.0085752)***	(.004178)***	(.0073922)***	(.0044027)
n	150	150	150	150
R^2 within	0.3113	0.1125	0.2351	0.2326
R^2 between	0.0300	0.2378	0.1469	0.0169
R^2 overall	0.0457	0.1014	0.1335	0.0000
F-Value	10.85	3.04	7.38	7.28

Robust Standard Errors in Parenthesis
* = significant at the 0.1 level, ** = significant at the 0.05 level,
*** = significant at the 0.01 level.

Table 3b – Regression Results

Regression	5	6	7
Variable	Procurements	Grants	Salaries/Wages
Whitelag2	-2.755059	1.49881	.4167813
	(4.189561)	(3.5226)	(1.713898)
Voting	1349.818	1045.597	100.5934
	(956.2901)	(804.0526)	(391.2065)
RepLag2	-33.30354	432.1779	59.26643
	(253.5373)	(213.1752)**	(103.719)
GDP	-.0084681	-.0253371	-.0102463
	(.0046968)*	(.0039491)***	(.0019214)***
n	150	150	150
R^2 within	0.0673	0.3196	0.2429
R^2 between	0.0305	0.0654	0.1691
R^2 overall	0.0022	0.1119	0.0521
F-Value	1.73	11.27	7.70

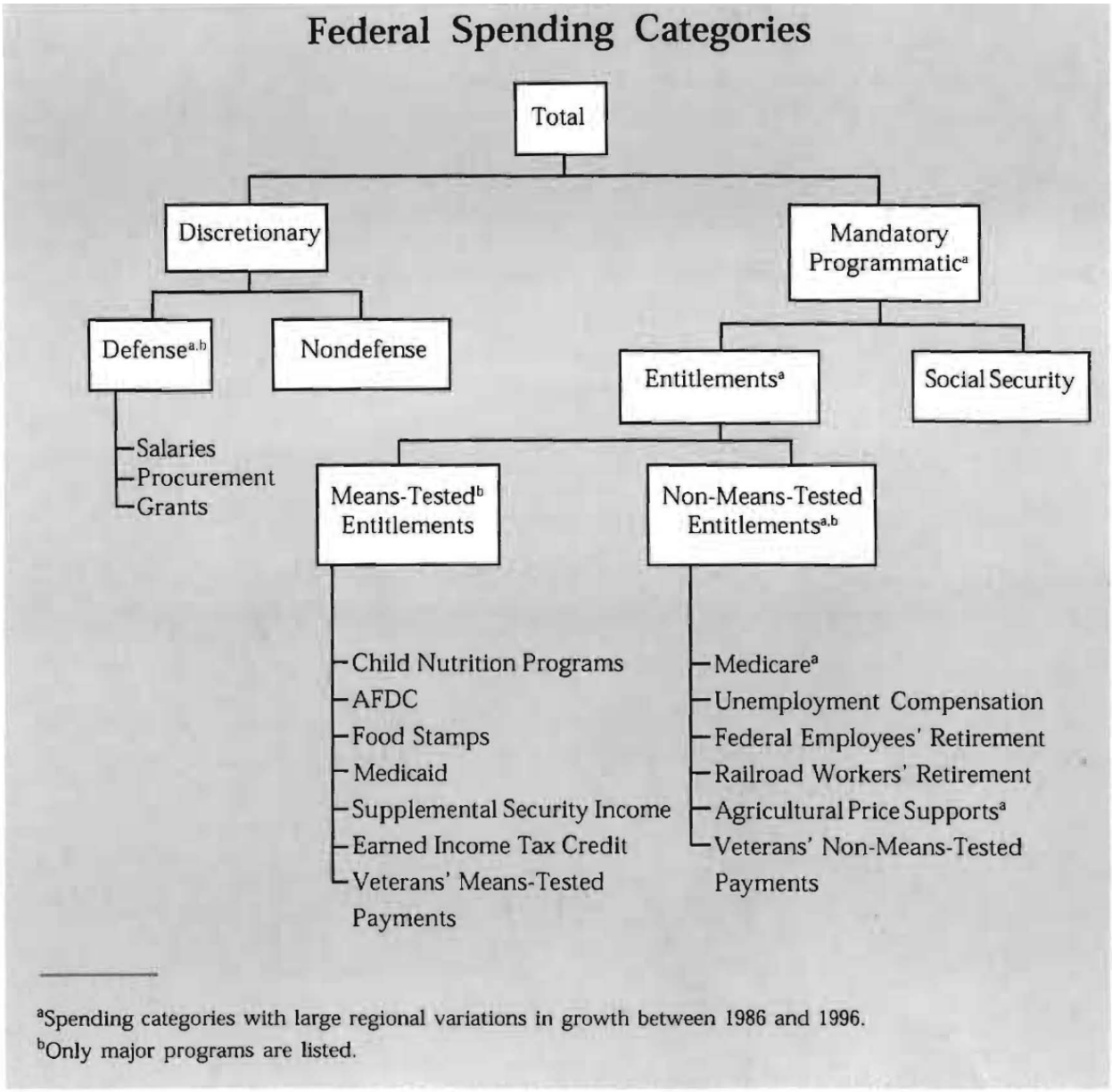
Robust Standard Error in Parenthesis

* = significant at the 0.1 level, ** = significant at the 0.05 level,
*** = significant at the 0.01 level.

Table 4 – Significance

Variable	Significance of Replag2	Significance of GDP	Significance of Voting
Per Capita	Yes	Yes	No
Defense	No	Yes	No
Non-Defense	Yes	Yes	No
Direct Payments	Yes	No	Yes
Procurements	No	Yes	No
Grants	Yes	Yes	No
Salaries and Wages	No	Yes	No

Fig. 1


Federal Spending Categories
Total
Discretionary
Mandatory Programmatic[a]
Defense[a,b]
Nondefense
Entitlements[a]
Social Security
Salaries
Procurement
Grants
Means-Tested[b] Entitlements
Non-Means-Tested Entitlements[a,b]
Child Nutrition Programs
AFDC
Food Stamps
Medicaid
Supplemental Security Income
Earned Income Tax Credit
Veterans' Means-Tested Payments
Medicare[a]
Unemployment Compensation
Federal Employees' Retirement
Railroad Workers' Retirement
Agricultural Price Supports[a]
Veterans' Non-Means-Tested Payments
[a]Spending categories with large regional variations in growth between 1986 and 1996.
[b]Only major programs are listed.