

The Effects of Congressional Appropriation Committee Membership on the Distribution of Federal Research Funding to Universities

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Abstract: This paper examines the impact of congressional representation of a university through district representation or an alma mater affiliation on the distribution of research funding to research and doctoral universities in the United States. Because appropriations are allocated to agencies on an annual basis, Congress and agencies may be considered strategic actors that seek to minimize as well as exploit their differences in informational asymmetries. Using a data set that covers more than twenty-five years of data, I find there are strong effects from congressional representation on the distribution of research funding. These effects vary based on the type of representation, the seniority of the member serving on the committee, as well as the type of ownership of the university (private or public). Depending on the empirical specification, political diversions of research funding range between four and forty-eight percent. Surprisingly, the diversions associated with an alma mater affiliation are more robust than the diversions associated with district representation, suggesting the existence of political slack. These results suggest that informational asymmetries play a role in the level of congressional influence on agency actions. In addition, the results suggest that actions taken by members of the appropriations committees vary based on their tenure on the committees.

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In 1994 members of the Republican Party pledged to seek legislation to impose term limits on members of Congress. This pledge stemmed from the popular belief that senior members of Congress tend to promote personal interests or are more influenced by lobbying efforts that may not be representative of their constituents. Today, term limits continue to be discussed but have not been enacted; instead, many members have focused their energies towards minimizing the time spent on any particular committee of Congress, believing that tenure on a committee is a more serious concern than mere tenure in Congress. Implicit in these concerns is the issue whether as incumbent politicians plan to retire whether they will behave differently and, if so, whether tenure on a congressional committee exacerbates this behavior.

This paper explores the role of membership on the appropriations committee on the distribution of federal research funding to research and doctoral universities. Specifically, it explores whether politicians use their position on a committee to promote interests that are different from their constituents. Previous research has explored the existence of such “slack behavior” by using the voting records of politicians on certain issues and relating it to demographic and economic characteristics of the politicians’ constituents. This paper explores the issue of slack differently. Using a data set that spans 25 years, I explore how membership on the appropriations committee affects the distribution of federal funding with respect to research conducted by research and doctoral universities. I compare the effect of having a member with an alma mater affiliation with the effect of having a member with a university located in the member’s district. I use district representation to proxy favoritism that reflects a politician’s constituents. Given in most instances an alma mater affiliation is not the same as district representation (state representation if the member is a senator), I use alma mater affiliation to proxy favoritism that reflects more from the politician’s personal interests.

With respect to research funding (and most types of discretionary funding), the ability of a member of Congress to engage in slack behavior will be tied to the relationship between Congress and the agency responsible for distributing the funding. Thus, we must take into account the principal-agent hypothesis between Congress and agencies. Under the principal-agent hypothesis, the degree by which Congress may impact an agency's decisions depends on the level of informational asymmetries. Inefficiencies may result from either too much congressional or too much agency dominance thereby increasing the social cost of a good or service provided through a government agency. Inefficiencies that arise from congressional control of bureaucratic behavior stem from congressional members, acting alone or together, taking actions based on the interests of certain constituents as well as following their own ideology or interests. Inefficiencies that arise from agency control of bureaucratic behavior stem from the agency's desire to maximize its size or power.

Federal research funding accounts for more than 60 percent of research funding received by research universities. Previous research has shown a positive impact of research funding on research outcomes (see, e.g. Adams and Griliches (1998), and Payne and Siow (2000), Connolly (1997), Payne (1999, 2000)). Arora and Gambardella (1997), examining NSF funding to economists over a five-year period, find a positive correlation between agency funding and young researchers and less of an impact on more senior researchers. With the exception of Payne and Siow (2000), these papers do not consider that political diversion of funds may promote or detract from research productivity as with any other federal program.

This paper takes a fresh approach at examining the impact of congressional appropriations committees on the distribution of research funding to universities. Others have studied issues regarding the allocation of federal research (see, e.g., Lazear (1996), Lichtenberg

(1998), and Savage (1991, 1999)).¹ Savage (1991, 1999) explores issues concerning congressional earmarking of funds to universities, focusing on the relationship between key members on the appropriations subcommittees. His study suggests the chairs of the appropriations subcommittees possess the power to prevent or minimize the extent of pork barreling in the appropriations bills with respect to earmarked funding.

I concentrate on the impact of membership on the House and Senate appropriations committees since these committees wield the greatest power in the allocation of research funding. My work extends and differs from the work of Savage (1991) along two dimensions. First, I examine total federal research funding whereas Savage explored only earmarked funding. Second, I explore the role of membership on the appropriations committee using a panel structure to the data. Thus, I explore in more depth the role of having members join and leave the appropriations committees after controlling for the heterogeneity that exists across different universities. Initially, I find very little evidence of an effect of district representation on the distribution of research funding to research and doctoral universities; after extensive analysis, I find that the distribution of research funding is correlated with district representation. I find the distribution of federal research funding is strongly affected by the political process when I examine the alma mater affiliation of members on the appropriations committee. Thus, my results suggest several things. First, it appears that with respect to district representation, personality may matter in the role that politics plays. This confirms the research conducted by Savage (1991), who finds that individual members play a significant role in promoting or limiting distributive politics. Second, to the extent that alma mater affiliation can be associated

¹ Lichtenberg (1998) studies the allocation process of biomedically funded research, examining the relationship between the distribution of funds to research projects and the expected life-years lost associated with the diseases on which the research is being conducted. Lazear (1996) studies the incentives provided by agencies to researchers in the structure of their allocation process. Using an overlapping generations model, he examines such questions as

with slack behavior, the results suggest that slack behavior does exist, especially with respect to more senior members serving on the appropriations committee. Given the average diversion from having a political affiliation by a senior member ranges between \$1 and \$18 million, depending on the analysis, the net affect of having a senior member on the committee suggests a diversion of research funding that ranges between two and forty-two percent of research funding. These diversions represent a social cost to the awarding of research funding insofar as politically driven funding results in less productive research. Although previous research suggests federal funding can increase research output, political diversions, may, in part, reduce the effectiveness of federal funding.

The paper is set forth as follows. Section I presents a conceptual framework and section II provides a brief overview of the appropriations process as it relates to research funding. Section III discusses the data and methodology used to measure the level of political influence over research funding. Section IV discusses the results and Section V provides a brief conclusion.

I. Conceptual Framework

Since WWII, the federal government has played a significant role in funding basic and applied research. The federal government became more heavily involved as a result of its recognition that research is important for economic growth and that the private sector was under engaged in the research process. The Bush report recommended the establishment of a single agency that would be responsible for allocating all federal funding appropriations for research. Although the National Science Foundation was established as a result of the Bush report, it did not become the sole agency responsible for allocating research funding. Most agencies have

what topics should be funded, whether small and large awards should be made, to what extent should past research experience be considered, and whether junior and senior researchers should be treated differently.

adopted a peer-reviewed process for distributing research funding to universities. This process attempts to elicit information from researchers engaged in similar research about the quality of the projects for which funding is sought, seeking to minimize the politics associated with federal agencies and Congress. The agencies, however, are not completely autonomous from Congress. Thus, Congress may indirectly influence the actions taken by the agencies. Because agencies receive their funding from Congress (with the approval of the President), Congress has several avenues by which to monitor and/or control an agency's actions, ex-ante and ex-post. Thus Congress and agencies are likely to be strategic in their actions, thereby creating a principal-agent relationship (see, e.g., Miller & Moe (1983)).² The degree to which an agency reflects the preferences of Congress depends on the level of information asymmetries between Congress and the agencies (see, Calvert, McCubbans, and Weingast (1994)).

With respect to research funding, assuming that most members lack the information needed to evaluate the quality of research proposals, potential areas of influence they may exert over an agency may be with respect to funding allocated to an agency. Thus, if Congress is not satisfied with the distribution of funding to certain schools or to geographic areas, funding to agencies in future years may be affected. For example, if members believe that more research funding should be devoted to such things as cancer research or a "star wars" defense program, the budget can be adjusted to focus more funding on these areas, thus, potentially minimizing the discretion an agency may have over the distribution of funding within the agency. Similarly, if a member is from a region that is known to be an expert in a particular area of research, that member may seek to promote funding to programs related to that research area.

² Similar in this vein is the transaction cost framework. See Huber and Shipan (2000) for a discussion of how this framework explains legislative control of bureaucratic behavior.

In addition to affecting the level of funding that agencies may distribute and the programs under which the agencies must operate, in recent years, Congress has affected the distribution of research funding in two other, more direct, ways. First, Congress can directly appropriate funding by earmarking specific amounts to particular universities. Earmarks started being allocated to universities in large numbers in the early 1980s.³ Savage (1999) documents and explores the issues surrounding earmarked funding. Despite much media coverage concerning earmarks, they represent a small portion of research funding. A second way Congress has affected the distribution of research funding, is by encouraging agencies to develop set-aside programs whereby agencies seek more competitive research proposals from researchers affiliated with universities that are located in states that have historically received low levels of funding. Set-aside programs were established in the early 1980s as pilot projects and have grown in the last 30 years. These programs solicit more competitive proposals from researchers affiliated with a university (or other research institute) located in a state designated for a set-aside program. Thus, set-aside programs limit the number of competitive proposals that will be considered for funding by limiting the number of states with which researchers may be affiliated.

For a more complete description of the different methods used to allocate federal research funding, see Feller (1999). Given there are several ways in which Congress may affect the distribution of funding, the next issue concerns for what purpose may a member of Congress seek redistribution. As set forth in Peltzman (1976, 1984) and others, a politician's actions may be driven from an interest to represent all or part of his constituents or for personal reasons. If a politician does not reflect the interest of his constituents, he is considered to be shirking his responsibility and engaging in political slack (*see, also*, Huber, Shipan and Pfahler (2001) and Rothenberg and Sanders (2000)).

³ See Savage (1991, 1999) for a more detailed description of earmarking.

Little research has examined the role of slack with respect to the appropriations process (*see*, Adler (2000)). With respect to federal research funding, there are several reasons why a politician may want to have funding distributed to the universities located in his district. First, given that research funding benefits the university by increasing the level of university resources, this will benefit the community and/or promote growth of other sectors within the district. Second, constituents may judge a politician by his ability to bring federal funding to his district. Thus, if politicians can affect the distribution of research funding, we should see an effect with respect to those universities located in the district represented by the politician.

Similarly, a politician may encourage research funding to a particular university for personal reasons, thus, demonstrating slack behavior. The presence of slack is difficult to measure with respect to research funding. One potential measure of slack is with respect to those universities from which a politician received an undergraduate degree. Assuming the university is not located in the same area represented by the politician, there is little reason to suggest that favoring one's alma mater promotes the interests of a politician's constituents.⁴

To explore the effect of political representation on the distribution of federal research funding, I examine the relationship between research and doctoral universities and the members of Congress that sit on the appropriations committee. As explained in more detail below, for each member on the appropriations committee between 1972 and 1998, I identified the universities located in their district as well as the universities from which they received an undergraduate degree. In addition, I identified their status and tenure on the committee. All of this was hand-

⁴ One argument against this is if one's constituents are interested in a particular type of research and the best research is being conducted at the member's alma mater institution. For example, if a particular district or state has experienced an epidemic of some disease, relative to other districts or states and the best research related to the epidemic is being conducted by a university in another district that happens to be the member's alma mater. Although this scenario is certainly plausible, given the distribution of alma mater affiliated universities and the empirical specification used in this paper, the likelihood of this type of phenomenon being the primary explanation of a relationship between alma mater affiliation the distribution of research funding is very low.

collected using publicly available information. With this information, I explore the questions of whether politicians affect the distribution of federal research funding and, if so, the extent to which the distribution is attributable to constituent interests or political slack.

II. Appropriations Process and Research Funding

Detailed accounts of the appropriations process may be found in Fenno (1966), National Academy of Science (1995), and Schick (1995). A history of the research funding process and the role of the federal government may be found in Drew (1984), Gieger (1993), and Kleinman (1995). With respect to discretionary funding (funding that is not required to be allocated under mandatory entitlements, e.g. social security, Medicaid), the appropriations committee is responsible for the budgets of all agencies. Although the entire Congress and President must approve the final budget bill, much of the discussion concerning the structure of the budget is discussed and developed by the appropriations committees and subcommittees. In addition to determining the annual appropriations, these committees also provide guidance to agencies with respect to the expenditures of their funds. Although, agencies are not required to follow this guidance, it is expected that most agencies will attempt to comply with the wishes of the appropriations committees, given these committees are initially responsible for the appropriations to the agencies every year.

The classic work discussing the role taken by members of the appropriations committee is that of Fenno (1966).⁵ In general, it has been shown that members of this committee tend to exert much power over the budget. Positions on the committee and the subcommittees are coveted. Provided a member succeeds in his or her reelection efforts, once on the appropriations committee, the member is likely to serve several terms on the committee. Members who are

⁵ See, also, Savage (1991).

appointed to the appropriations committee are prevented from serving on any standing committee of Congress, thereby emphasizing the importance of their role on the appropriations committee. As a result of the complexity of the government's budget and tenure on the committee, members develop a great deal of expertise with respect to the appropriations process. Thus, other members of Congress tend to defer to the decisions made by the appropriations committees. The role on an appropriations subcommittee can be just as important, if not more, as the role on the appropriations committee insofar as the subcommittee is responsible for the initial allocation to specific federal agencies.

With respect to the mechanics of the appropriations committee, the party in power of each chamber decides the number of majority and minority members that will serve on the appropriations committee. Each party selects their members to the committee. The chair of the appropriations committee determines who serves on each of the thirteen subcommittees. In terms of the budget process, each year the President submits a proposed budget that includes each agency's request for funding. The level of detail for agency funding varies across the different agencies. The appropriations committee in the House reviews and changes the budget. The Senate acts second, therefore, acting more as an appellate body for the budget.⁶ In the end, the two chambers and the President must approve the budget.

There are several ways a university may receive special treatment with respect to research funding. Influence by Congress may stem from the university, an agency, independently by a Congress member's effort, or through the efforts of lobbyists. Members' actions may be direct or indirect. Direct actions include earmarking specific amounts to particular universities

⁶ Although the Constitution dictates that revenue raising measures must be initiated in the House of Representatives, there is no such provision with respect to the appropriations process.

or directing agencies to appropriate funds to specific universities.⁷ Earmarks started being allocated to universities in large numbers in 1983. Despite much media coverage concerning earmarks, however, they represent a small portion of research funding. Thus, most research funds continue to be processed and determined by federal agencies. Congressional influence over the direction of research funding is likely to be more through indirect means.⁸

III. Data and Methodology

The data for this project were gathered from two sources: congressional appropriations committee data and CASPAR data on federal funding and institutional characteristics.⁹ For information on the congressional appropriations committees, I hand collected data on congressional membership on the appropriations committee and subcommittees for both chambers of Congress for the period 1970 to 1998. Except for the occurrence of a death or resignation, both committees may change members every two years.¹⁰ For each member that served on the appropriations committee during this period, I identified the state represented by the member, the political party affiliation of the member, the member's position on the

⁷ Examples of recent earmarks include \$300,000 to the University of California at Davis for research on rice straw; \$3.9 million to the University of Maryland for the fuel cell bus program; \$220,000 to the University of Maine for research on low bush blueberries.

⁸ Congress, the President, and/or agencies could initiate this influence. The common perception is that a member of Congress may initiate a request for favoritism. Favoritism, however, could be initiated by the agency. Under the assumption that most agencies desire more funds for their activities, one way to "justify" a bigger budget could be through awarding grants to universities affiliated with the members of the appropriations committee. This paper does not distinguish between favoritism initiated by members of Congress and favoritism initiated by agencies or other governmental entities. Similarly, universities may or may not seek favoritism from Congress members, either directly or through collective lobbying groups. Savage (1999) discusses reasons why a university may seek favoritism from Congress. Although it is common for a university or group of universities to maintain lobbyists in Washington to keep informed about proposed changes that would affect the operation of their universities, this paper does not distinguish between those universities that actively seek special treatment from those that do not.

⁹ CASPAR stands for Computer Aided Science Policy Analysis and Research. It includes several data sets collected by NSF, National Center for Education Statistics, and other federal agencies. Information on CASPAR may be found at <http://www.nsf.gov>.

¹⁰ This is due to the fact that there are elections for both chambers every two years. In the House of Representatives, all members must be elected or re-elected every two years. In the Senate, one-third of the members are elected or re-elected every two years since a given member holds office for six years.

committee, the undergraduate alma maters of the member, and the district of representation.¹¹ With respect to the member's position on the committee, there are three possible positions, majority and minority chair person and general member. The majority chair is assigned to a member affiliated with the political party that controls the chamber of Congress for which the members serve; the minority chair is assigned to a member affiliated with the political party not in control. I concentrate on the members that are not the majority or minority chair person of the appropriations committee. I do this because during the sample period, there are few changes in these positions, thus, allowing for little variation in the data analysis.

Using the CASPAR data set, I gathered financial data on the universities on an annual basis for the period 1973 to 1997. There are several measures of government funding which may be used. I use the federal obligations for science and engineering. This measure reports the actual obligations of the federal government made in the fiscal year for which the data are reported. I combined these data with the data on congressional representation and determined those universities for which there is alma mater and/or district representation for each year during the period under study.

I limit my analysis to those universities with a Carnegie (1994) classification of research or doctoral university.¹² This leaves 230 universities that I can analyze. Approximately 55 percent of these universities are classified as a research university. Of these 230 universities, 73 of the universities have alma mater representation and 181 of the universities have district

¹¹ In some of the larger metropolitan areas, it was difficult to distinguish which members represented which universities. Therefore, I was over inclusive in assigning the universities to representatives. For example, if there is a member on the House appropriations committee that serves a part of Manhattan, then Columbia University and NYU university (and all other universities located in Manhattan) would be treated as part of the member's district.

¹² Research universities are defined as those that give high priority to research and award at least 50 doctoral degrees each year. Doctoral universities differ from Research universities in that they do not meet minimum requirements with respect to federal support the number of doctorate degrees awarded. While there are universities that have obtained the research or doctoral institution status subsequent to 1972, there is little or no attrition of universities from these classifications.

representation at some point during the sample period. Of the 73 universities with an alma mater affiliation, there are 58 universities with an affiliation in the House and 38 universities with an affiliation in the Senate.¹³ Of the 181 universities that are represented, 45 universities are represented in the House and 168 universities are represented in the Senate.¹⁴ A list of universities and their type of alma mater and/or district affiliation is provided in Appendix 1.

To compare representation with no representation in the table of means, I lag the congressional measures by one-year on the assumption that the funding is allocated to the agency in the first year and the funding is distributed by the agency to the university in the second year. For the graphs and regression analysis, I use a two-year moving average of the federal research funding.¹⁵ In addition, the federal funding measure is reported in constant dollars with 1996 as the base year, using the deflation index for higher education as provided by CASPAR.

Table 1 reports summary statistics on the annual federal research funding to research and doctoral universities during the period studied.¹⁶ Across all 230 universities, the average level of funding is \$42 million; the average is slightly higher for private universities. For the universities for which there is at least one year district representation during the sample period, the average level of funding is \$43 million for the years for which there was representation and \$47 million for the years for which there was no representation. This suggests there is no strong positive relationship in the distribution of research funding based on district representation. For the

¹³ Of the 58 universities with an alma mater affiliation in the House, 18 universities are private and 40 universities are public. Of the 38 universities with an alma mater affiliation in the Senate, 11 universities are private and 27 universities are public.

¹⁴ Of the 45 universities with district representation in the House, 24 universities are private and 21 universities are public. Of the 168 universities with district representation in the Senate, 63 universities are private and 105 universities are public.

¹⁵ In many agencies, research grants are awarded in one year but then distributed to the university over several years, whereas the funding to the agency is allocated over an annual basis. Thus, this raises an empirical issue as to how to compare congressional representation and the distribution of funding. In the analysis, I have used different lag lengths as well as averaged the data over two and three year periods. The results vary insignificantly based on what empirical structure that is used. I choose to use a two-year moving average for the regression analysis because the standard errors are lowest under this specification.

universities for which there is an alma mater affiliation by a member for at least one-year during the sample period, the average level of funding is higher than the average level of funding across all universities. The average level of funding is \$76 million for the years for which there was an affiliation and \$54 million for the years for which there was no affiliation. This suggests a strong positive relationship in the distribution of research funding based on an alma mater affiliation.

Table 1 does not take into account two issues. First, it does not reflect that the level of funding allocated for research has varied over time. Second, it does not control for the heterogeneity in the universities receiving the research funding. For example, if one university has a better reputation than another, this could result in that university receiving more in research funding because its faculty submit higher quality proposals. Similarly, if a university has a medical school affiliated with it, the funding allocated to that university may be greater than the funding allocated to a university that does not have a medical school. To address these issues, figures 1-4 reflect the average level of funding over time to universities in the years in which they have or do not have representation or an alma mater affiliation after controlling for non-time varying differences across the universities. To get this measure, I ran a fixed-effects regression whereby I use a set of dummy variables that identify the university to allow for the average level of funding at each university to vary based on the non-time varying differences. I then graph the average of the residuals of this regression. Thus, the residuals will capture aspects of the funding distributed to the universities that are not accounted for in the university fixed-effects. Because the averages are different for the public and private universities in Table 1, the figures examine the relationship between representation and non-representation at public and private universities differently. In all of the figures, however, I also depict the average level of funding after controlling for university heterogeneity across all public or private universities, respectively.

¹⁶ All dollar amounts are reported in 1996 dollars.

In Figure 1, I depict the average level of funding after controlling for university heterogeneity for those public universities for which there was at least one year of district representation during the sample period. I depict separately, the average funding for those years in which there is representation and those years for which there is no representation. The figure suggests there is very little difference in the average level of funding based on whether there is representation over the sample period. To the extent there is a difference, this is seen in the early part of the period, prior to 1986. Given that earmarking of funding to universities became more prevalent in the latter part of the period, thus representing a more direct way of diverting research funding by Congress, it is interesting there is little difference between the average funding when there is representation and when there is no representation subsequent to 1986.

In Figure 2, I depict the average level of funding after controlling for university heterogeneity for those private universities for which there was at least one year of district representation during the sample period. Again, for most of the sample period, there is very little difference in average funding in those years for which there is representation and those years for which there is no representation. Subsequent to 1993, however, the gap between average funding for those universities with representation in those years and those universities without representation widens, providing some evidence that district representation may matter.

In Figures 3 and 4, I depict the average level of funding after controlling for university heterogeneity for which there was at least one year of alma affiliation during the sample period for public and private universities, respectively. As with Table 1, both figures suggest a different relationship between alma mater affiliation and district representation with respect to the distribution of research funding. For the public universities, prior to 1985, the average level of funding is higher for those universities without an affiliation. Between 1985 and 1989, there is very little difference between the average funding when there is and is not an affiliation.

Subsequent to 1989, there appears to be a substantial premium for having an alma mater affiliation for most of the years. With respect to the private universities, Figure 4, the average level of funding is higher when there is an alma mater affiliation in the early and later part of the sample, but the gap during these periods is not very big.

Table 1 and the figures suggest that alma mater affiliation matters, but district representation may not, especially in the early part of the sample. To explore further the effect of committee membership further I use the following model:

$$G_{irt} = \alpha_i + \lambda_{rt} + R_{irt-1} \beta + \delta A_{irt-1} + \tau O_{-rt} + \sigma I_{r-it} + v_{irt} \quad (1)$$

where G represents the two year average of research funding to university i, located in region r, at year t (and year t-1), R represents the vector of Senate and House measures indicating whether the university has alma mater affiliation or district representation at time t-1.¹⁷

I conduct separate analyses to measure the affect of alma mater affiliation and district representation. I use the general member measures and the tenure measures in separate specifications.¹⁸ In the specification with only the alma mater measures, I include only those universities for which there was an alma mater affiliation during the sample period. Because the specifications include university fixed effects, including the universities that do not have an alma mater affiliation would make the estimates less precise. In this specification, included would be universities with both an alma mater affiliation and district representation during the sample

¹⁷ Because a research grant may be awarded in one year but then distributed over several years, I average the funding over a two-year period to reflect this. The results, however, do not differ dramatically based on whether I do a two-year average or a three-year average or do not average the data. I report the results from the two-year average because the standard errors are smaller with the average than when I do not average the research funding.

¹⁸ One potential issue concerns the correlation between the alma mater and the district political measures. If many of the observations contain both alma mater and district representation then the coefficients may not be interpretable because of multicollinearity. As it turns out, at both the university and agency level, less than ten percent of the observations contain both an alma mater and district affiliation in the same chamber for any given year. Across the sample, approximately 25 percent of the universities have district and alma mater representation at some point during the sample period. These universities include some of the big state universities such as University of Alabama, University of Wisconsin at Madison, Michigan State University, University of California at Los Angeles, and Pennsylvania State University.

period. Similarly, in the specification with only the district representation measures, I include only those universities for which there was district representation during the sample period.

Given a member may have both a district and an alma mater affiliation, A indicates whether the university has a member with the other type of affiliation at time $t-1$. Thus, if we are measuring the effect of an alma mater affiliation, R represents the vector of measures that identify the type of alma mater affiliation and A is a dummy variable equal to one if the university also has a member that represents the district in which the university is located.

I also include university fixed effects. The university fixed effects control for non-time varying heterogeneity across the universities. Because I am including university fixed effects, however, the coefficients on the political measures represent the measurement of a change in committee membership. A change in membership includes a move on or off the committee and a move from being a general member to a leadership position.¹⁹

Given the sample period is more than 25 years, however, we might expect the universities to have grown differently. To account for this, I could interact the university fixed effect with a time trend. This specification would allow universities to grow differently. A potential problem with this specification is if a university's growth includes changes in its relationship with politicians that is correlated to movement on and off the appropriations committee, then part of the effect of having a member on the appropriations committee will be captured by the university time trend effect. I report the results from this specification in Appendix Tables 2 and 3; for the most part, the conclusions that may be drawn from the specifications that use a university time-trend are similar to those reported below; the magnitude of the coefficients, however, decreases.

¹⁹ If fixed effects are not included in the regression, the results suggest a very strong affiliation between membership on the appropriations committee and alma mater or district representation. Alma mater representation alone accounts for approximately 12 percent of total variation in research funding to universities; district representation alone accounts for less than 3 percent of total variation in funding.

In equation (1), lambda represents a regional time trend that should control for changes in economic, demographic, or political environments across time that affect all universities in a region similarly. Such effects would include changes in the government's budget, changes in attitudes about research funding, macro level economic changes, and changes in the political party in power in Congress and the Executive Office.²⁰

In addition to the above measures, I include measures to control for possible changes in government policy regarding research funding that may affect universities differently as well as to control for the impact of other universities on the actions taken by the university under study. The first measure is the average level of research funding to universities located outside of the region in which a university is located with the same type of ownership (public or private) and Carnegie (1994) classification. The second measure is the average level of research funding to universities located in the region in which a university is located with the same type of Carnegie (1994) classification after excluding the level of funding to the university under study.²¹

There are several ways to depict political affiliation in the regression analysis. I have chosen four groups of measures. First, for each chamber I created two measures. The first measure identifies whether there is at least one member with an affiliation that is a chair of one of the appropriations subcommittees. The second measure identifies the number of general members with an affiliation serving on the appropriations committee; this ranges from 0 to 3 in the House and 0 to 2 in the Senate. The first measure is designed to capture the effect that

²⁰ The following states are covered within each region: Region 1: Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont. Region 2: New Jersey, New York, and Pennsylvania. Region 3: Illinois, Indiana, Michigan, Ohio, and Wisconsin. Region 4: Iowa, Kansas, Minnesota, Missouri, North Dakota, Nebraska, and South Dakota. Region 5: District of Columbia, Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia. Region 6: Alabama, Kentucky, Mississippi, and Tennessee. Region 7: Arkansas, Louisiana, Oklahoma, and Texas. Region 8: Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming. Region 9: Alaska, California, Hawaii, Oregon, and Washington.

²¹ Including these measures in the specification, the coefficients, in particular those on the alma mater measures decrease, suggesting these additional measures are picking up a time-varying measure that is correlated with research funding and the political measures.

Savage (1991) found that chairs of the subcommittees have power to block or to promote pork barrel politics. Excluded from this specification is whether there is an affiliation by the university with the chair of the appropriations committee in either chamber. Over the sample period, this position changed only a few times and, thus, from an empirical perspective, there is very little variation with which to measure the affect of the chair of the appropriations committee. Moreover, given the chair of the appropriations committee may have a different agenda than the general members on the committee, it is not appropriate to include them with the measure reflecting the number of general members on the committee.

The second group of measures is designed to reflect that tenure on the committee may result in different preferences by the members towards pork barrel politics. For each chamber I created three measures. Each measure identifies the number of members on the appropriations committee based on the number of years the member has been on the committee. The first measure is for those members with zero to three years on the committee, the second measure is for those members with four to eleven years on the committee, and the third measure is for those members with more than eleven years on the committee. If a member is concerned about getting re-elected in the early years during which he serves on the committee, then we should see a preference away from slack and towards representing one's constituents. If, in the later years the member is not planning on seeking re-election, we may see more evidence of slack.

The last two groups of measures explore whether the role of congressional membership on the distribution of research funding is different across public and private universities. Thus, I interact the political measures used in the first two groups with a dummy variable that indicates whether a university is public or private, respectively.²²

²² Another specification would be to interact the general member measure with a dummy variable indicating whether the university is classified as a research or doctoral institution. Under this specification there is some evidence that

IV. Results

Tables 2 and 3 report the results under the specifications described above. Overall, the results suggest membership on the appropriations committee influences the distribution of research funding to universities. The affect is strongest for those universities with an alma mater affiliation, especially with respect to members that are chairs of a subcommittee and those members with more seniority. The results also suggest that private and public universities are treated differently. With respect to district representation, the results are weaker and are not as consistent across the specifications.

Table 2 reports the results for the universities with district representation during the sample period. In column (1), I report the results for the specification that constrains the political effect to be the same across all universities and uses as political measures whether at least one member is a chair of a subcommittee and the number of general members serving on the committee. These results suggest that membership on the Senate appropriations committee matters but not membership on the House committee. The coefficient on the Senate general committee member is positive and significant at less than a five percent level, suggesting that, on average, having a member that represents the state in which an university is located will benefit that university by \$2.3 million. If that member is also a chair of an appropriations subcommittee, the average premium from district representation increases an additional \$2.2 million. Given the average level of funding to universities is \$42 million, having a member that is a chair of an appropriations subcommittee represents a potential average diversion of research funding of 11

doctoral universities benefit more than research universities with respect to an alma mater affiliation in the Senate and that research universities benefit more than doctoral universities in the House. Under the various specifications, however, these results are not robust. In yet another specification I interacted a dummy variable representing whether the year of funding was subsequent to 1983 with the general member measures. The use of this interaction is designed to capture that the actions of congress members may have changed after members started to use the earmarking process to divert directly funds to specific universities. Depending on the specification, the results

percent. The political measures are jointly significant, thus, suggesting that district representation can influence the distribution of federal research funding.

For those universities with both district representation and an alma mater affiliation in the same year, the coefficient on the dummy variable to indicate an alma mater affiliation is negative, suggesting that having both types of affiliation decreases the effect of having a member that represents the district or state in which the university is located.

In columns (2a), (2b), and (2c), I report the results when we relax the constraint that public and private universities be treated the same. In column (2a) I report the coefficients for the public universities and in column (2b) I report the coefficients for the private universities; in column (2c), I report the f-statistic for the test of whether the coefficients for the public and private universities are different from each other. With respect to membership on the Senate committee, the results under this specification suggest that public and private universities are treated differently. With respect to public universities, the coefficient is positive for general members but negative for members that also serve as a chair of a subcommittee; the net effect for a member that is also a chair of a subcommittee is, however, positive (\$3.5 million, on average). For private universities, the coefficient on the measure identifying the number of general members on the committee is imprecisely measured. The coefficient on the measure for whether there is a member who is a subcommittee chair, however, is quite positive, suggesting, on average, that having a subcommittee chair increases federal research funding by \$12 million. The coefficients suggest the behavior of chairs of subcommittees is different than those of general members. There are several explanations for the negative coefficient for the public universities. One explanation is the one suggested by Savage (1991); namely, that some of the individual

suggest that behavior may have changed to increase diversions to universities subsequent to 1983. Once I control for the ownership of the university and the tenure effects of the members, however, these results are diminished.

subcommittee chairs wielded enough power during this period to promote or to detract from pork barrel politics. Another explanation is one related to the issue of logrolling; namely that as a subcommittee chair, a member may have different priorities and is willing to sacrifice funding in one area to promote funding in another area.

In columns (3) and (4), I report the results from the specifications that identify membership on the committee based on tenure. With respect to membership on the Senate appropriations committee, the surprising result is that the coefficients that are significant under this specification are for the junior members. The coefficients for the senior members are imprecisely measure. This is surprising given the coefficients in the prior specifications on the measure that identifies if there is a member who is a subcommittee chair. With respect to the more junior members, the results suggest that they are more likely to favor a public university than a private university. On average, universities with state representation by a member with less than four years on the committee will benefit by \$3.5 million. Members with between four and eleven years on the committee positively affect private and public universities by similar amounts (approximately \$3 million on average).

The results reported in columns (3) and (4) are also surprising insofar as there are coefficients with respect to representation by members on the House committee that now significantly different from zero. The coefficient for the members with less than four years on the committee is positive and significant, with the private universities benefiting the most (an average of \$6.6 million). Public universities benefit from the most senior members on the committee; the coefficient for the private universities, however, is negative.

Across all four specifications, the results with respect to district representation are very sensitive to the manner in which I measure committee membership. Appendix Table 2 reports the results when I allow for a university trend effect, thus allowing universities to grow at

different rates. These results suggest that only public universities are positively affected by district representation (on both the Senate and the House of Representatives).

Table 3 reports the results for the universities with an alma mater affiliation during the sample period. The structure of Table 3 mirrors that of Table 2. If we measure membership by examining the number of general members and whether there is a member that is a subcommittee chair with an affiliation, the results suggest a negative effect from having a subcommittee chair in the Senate. In the House, however, both private and public universities benefit from having a university with an affiliation. The net effect for public universities is \$13 million from having a member that is a subcommittee chair, representing a diversion of approximately 31 percent. Moreover, the specifications that allow the membership on the committee to vary based on tenure (columns (3) and (4)), suggests that public universities benefit from an affiliation with members of all ranks, especially the more senior members. Thus, the results for the public universities with respect to the House are consistent across all of the specifications.

The net effect for private universities is \$3 million from having a member that is a subcommittee chair, representing a diversion of approximately 7 percent. In the specifications that allow the membership to vary by tenure, however, the coefficients at all ranks are negative for the private universities. These results are consistent with the results reported in column (2b) if, the subcommittee chairs come from all ranks. In most cases, this is not the case as members with tenure on the committee tend to be appointed as a subcommittee chair. If, however, there is a change in the party control of the House, it would be possible for a member with low tenure on the committee to be appointed a subcommittee chair.

With respect to the tenure measures for the Senate committee, the coefficients are negative and statistically significant at a p-value of less than .10 for all of the measures except for the private universities for the members with more than 11 years of experience. Thus, these

results suggest that universities do not benefit from having an alma mater affiliation in the Senate. Appendix Table 3 reports the results when a university time trend effect is included in the specification. These results differ from those reported in Table 3, particularly with respect to the tenure measures. The results in Appendix Table 3 suggest that universities positively benefit from having a senior member on the committee with an alma mater affiliation in both chambers. Overall, the results across all specifications with respect to the universities with an alma mater specification suggest that universities benefit the most from senior members and subcommittee chairs on the House committee; there is some evidence to suggest that universities also benefit from having a member with an alma mater affiliation on the Senate committee.

In the specifications for the universities with an alma mater affiliation, I also included a dummy variable equal to one if the university had district representation in the previous year. The coefficient on this measure is positive and statistically significantly different from zero, suggesting that universities benefit more from having a member that represents the district. In comparison to the results reported in Table 2, however, the coefficients on the alma mater measure in that table is negative, thus contradicting the results reported in Table 3 with respect to the district representation measure. To explore this further, I examined in greater detail the nature of the membership on the committees for those universities with an alma mater affiliation and a district representative in the same year. For the bulk of the observations, these two types of affiliations arise in the Senate, thus, suggesting the coefficients on the alma mater measure and the district measure in Tables 2 and 3, respectively, reflect primarily the effect of a university having an affiliation with a member from the Senate. As such, the coefficients do not contradict each other in these two tables. In Table 2, the coefficients for the Senate measures are positive and the coefficient on the alma mater measure is negative. This suggests that having a senator that has both an alma mater affiliation and represents the state in which a university is

located decreases the effect of any pork that may be distributed to the university compared to universities with only district representative. In Table 3, the coefficients for the Senate measures are negative and the district measure is positive. This suggests that having a senator that has both an alma mater affiliation and represents the state in which a university is located increases the effect of any pork that may be distributed to the university compared to universities with only an alma mater affiliation.

All of the tables illustrate that membership alone is not a sufficient predictor of whether a university may benefit from having an affiliation with a member on the appropriations committee. The factors that appear to be important are the member's chamber, the tenure on the committee, whether a member is a chair of an appropriations subcommittee, and whether the university is public or private. With respect to being a subcommittee chair, over the sample period, universities benefited most from the members of the Senate committee if the senator represented the state in which the university is located; universities benefited most from the members of the House committee if the representative had an alma mater affiliation with the universities. With respect to tenure on the committee, the results suggest that seniority counts most in the House for both district representation and alma mater affiliation. Public universities benefit from district representation in the Senate and from senior members on the House committee. Public universities benefit from alma mater affiliations on the House committee. Private universities benefit from district representation in the House by junior members on the committee. Private universities benefit from an alma mater affiliation in the House by members that are chairs of an appropriations subcommittee.

V. Conclusion

This paper supports the theoretical literature that Congress and agencies behave strategically. This paper suggests that research funding to universities is diverted to and from

universities due to the politics. Thus, this paper illustrates that, as will any other discretionary program which requires appropriations from Congress, because of lobbying from agencies, research universities, or other entities, research funding may be diverted for political purposes.

This paper finds that both alma mater affiliation and district representation of universities matter. With respect to district representation, the initial results fail to show any effect from having a member on the appropriations committee that represents the district or state in which a university is located. With some teasing of the data, however, the results suggest that indeed there is an effect from representation, especially in the Senate. With respect to alma mater affiliation, the results suggest very clearly there is an effect on the distribution of research funding to universities for which there is an alma mater affiliation. This is particularly true with respect to affiliations with public universities by members in the House.

The results also suggest evidence of political slack by members. To the extent that funding is diverted to universities in member's districts as well as to universities with which a member has an alma mater affiliation, given, in most instances, a member's alma mater is not located in that member's district, diversion of funds that is associated with a member serving on the appropriations committee supports the notion that political slack exists.

In a broader context, this paper illustrates potential problems that develop when members of congress have a long tenure on a committee. The diversions of funding associated with district representation and/or alma mater affiliation tend to be bigger for the senior members serving on the committee. Thus, this paper suggests that seniority on a committee may promote political slack. Whether this promotes or detracts from the efficient use of research funding, is left for future research. In addition, the question of whether seniority on a committee matters, it is left for future research to determine if switching committees reduces the effects of such slack.

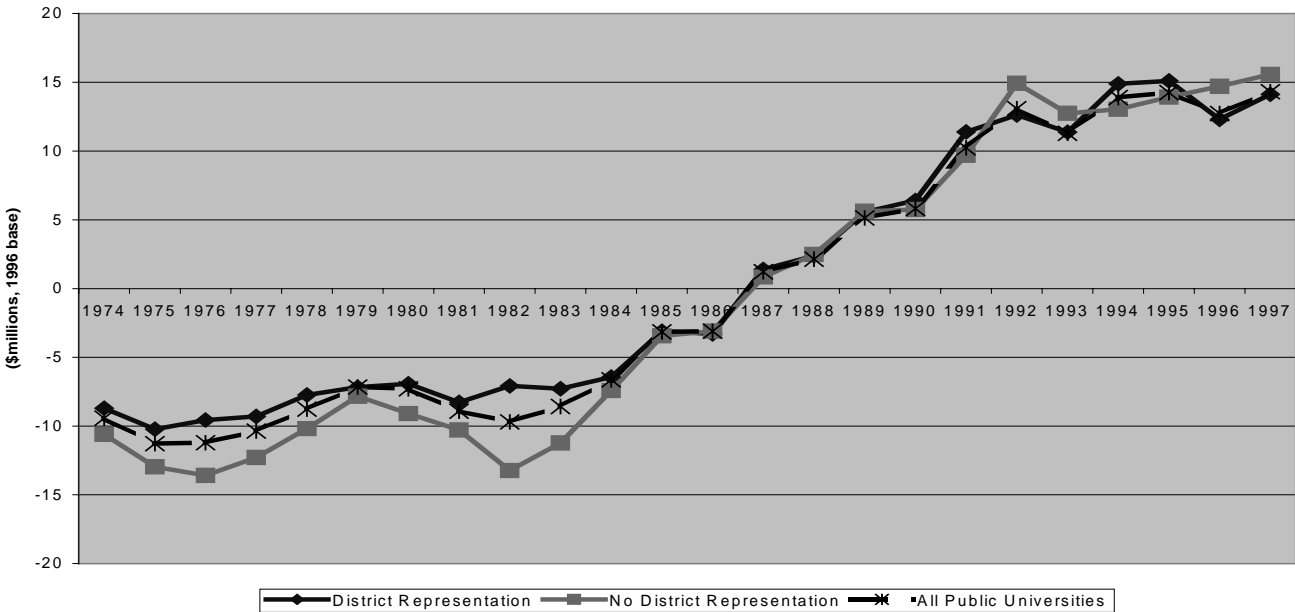
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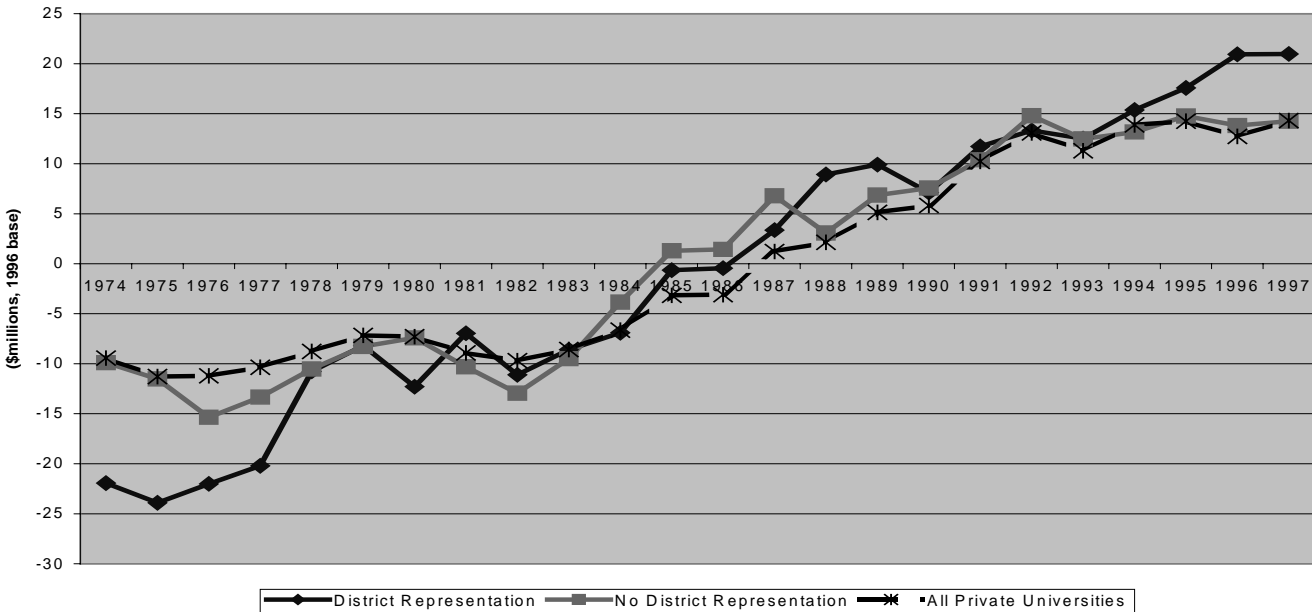
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Note: For all figures, a university fixed effect has been subtracted from the research funding measure.

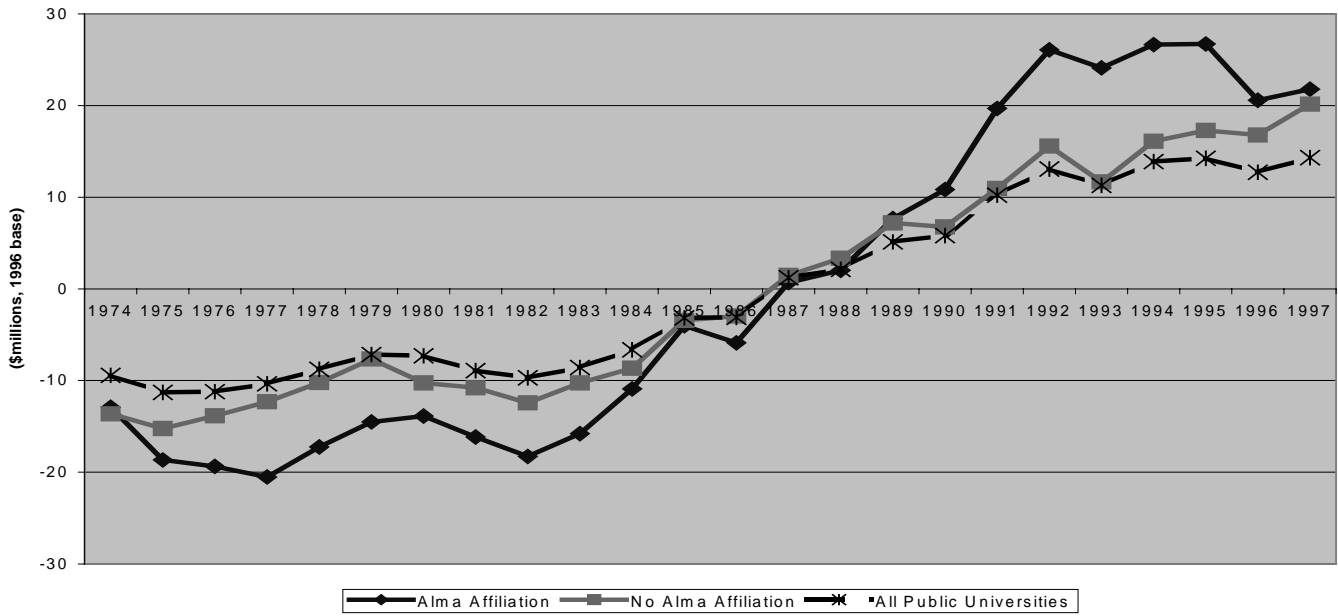
**Figure 1:
Average Federal Research Funding, Public Universities**



**Figure 2:
Average Federal Research Funding, Private Universities**



**Figure 3:
Average Research Funding, Public Universities**



**Figure 4:
Average Research Funding, Private Universities**

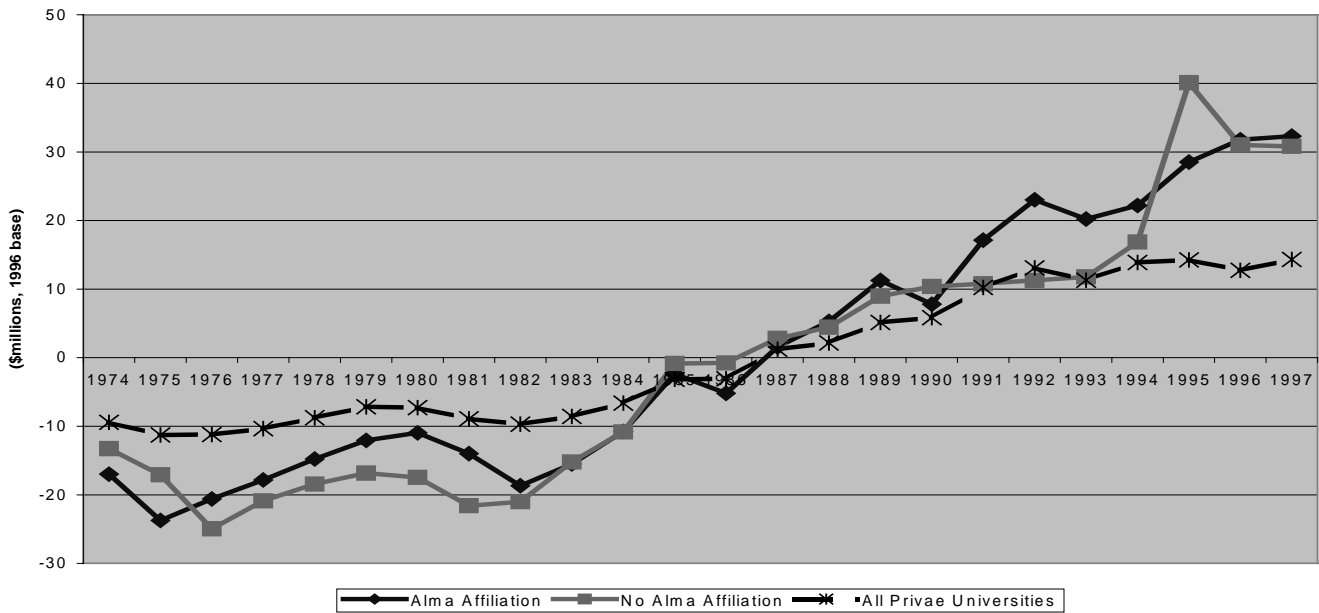


Table 1: Average Level of Annual Federal Research Obligations to Universities

	# of Obs	Mean	S.D.	S.D./Mean	Median	Maximum
All Universities	5327	41.6	66.4	1.6	16.9	795.2
Public Schools	3420	37.5	50.4	1.3	19.2	351.1
Private Schools	1907	48.9	87.7	1.8	13.9	795.2
Universities with Alma Mater Affiliation						
Alma Mater Affiliation	966	75.8	69.1	0.9	56.0	351.1
Public Schools	643	71.5	67.6	0.9	49.7	351.1
Private Schools	323	84.3	71.4	0.8	62.3	303.9
No Alma Mater Affiliation	783	54.1	59.5	1.1	31.2	332.6
Public Schools	554	45.7	44.6	1.0	31.2	245.5
Private Schools	229	74.4	82.0	1.1	32.5	332.6
Universities with District Representation						
District Representation	2504	42.5	71.8	1.7	18.4	795.2
Public Schools	1601	37.3	51.1	1.4	20.5	351.1
Private Schools	903	51.6	97.7	1.9	14.0	795.2
No District Representation	1817	47.2	69.6	1.5	17.9	671.9
Public Schools	1104	41.2	54.2	1.3	19.8	289.0
Private Schools	713	56.5	87.5	1.5	15.7	671.9

Note: All dollars are reported in millions (\$1996). Universities studied are those with a Carnegie (1994) classification of Research or Doctoral Universities

Table 2: Role of Politics on Federal Research Funding: District Representation

Universities with District Representation Dependent Variable: Annual Federal Funding (2 yr average)	Private=Public				Private=Public				# of Schools with representation	
	(1)	Public (2a)	Private (2b)	F-test (2c)	(3)	Public (4a)	Private (4b)	F-test (4c)	Public	Private
Senate Appropriations										
At Least 1 SubCommittee Chair	2.17 (1.11)	-1.34 (0.70)	12.61 (4.34)	9.68 (0.00)					76	28
General Member	2.31 (0.65)	4.78 (0.66)	-2.26 (1.58)	15.56 (0.00)					105	63
Tenure < 4 years					1.25 (0.98)	3.48 (0.71)	-3.59 (2.65)	6.53 (0.01)	104	63
Tenure 4-11 years					3.28 (0.87)	3.27 (0.69)	3.01 (1.77)	0.02 (0.88)	91	55
Tenure 11+ years					-0.51 (0.89)	0.64 (0.95)	-2.70 (1.81)	2.78 (0.10)	58	36
House Appropriations										
At Least 1 SubCommittee Chair	0.69 (2.18)	0.75 (1.69)	0.38 (3.77)	0.01 (0.93)					4	4
General Member	0.97 (0.94)	1.69 (1.33)	1.07 (1.34)	0.11 (0.74)					21	24
Tenure < 4 years					2.88 (1.32)	-0.63 (1.52)	6.60 (2.09)	8.33 (0.00)	16	19
Tenure 4-11 years					-1.67 (1.22)	-0.25 (1.88)	-3.08 (1.78)	1.17 (0.28)	14	16
Tenure 11+ years					1.60 (1.70)	8.24 (2.47)	-4.46 (2.18)	15.56 (0.00)	10	15
F-test on All Political Measures (p-value)	6.40 (0.00)		7.42 (0.00)		5.42 (0.00)		5.38 (0.00)			
Alma Mater Affiliation	-1.99 (0.87)		-2.45 (0.91)		-1.89 (0.87)		-2.18 (0.90)			
Average Funding Outside of Region	0.99 (0.11)		0.97 (0.11)		0.99 (0.11)		1.01 (0.11)			
Average Funding Within Region	-0.08 (0.10)		-0.08 (0.10)		-0.09 (0.10)		-0.10 (0.10)			
University Fixed effects	Yes		Yes		Yes		Yes			
Regional Trend Effect	Yes		Yes		Yes		Yes			
# of Observations	4259		4259		4259		4259			
# of Schools	181		181		181		181			
R-Squared	0.934		0.9347		0.934		0.9345			

Note: Robust Standard Errors in Parenthesis, Except Where Noted; all regressions reported over 2 columns; General Member = Number of members on the Appropriations Committee, excluding the majority leader and ranking minority member on the committee; Tenure: number of years of service on the Appropriations Committee for all members; Average Funding Outside of Region = Average federal obligations for universities with same type of ownership (public or private) and Carnegie (1994) Classification (Research I, II, Doctoral I, II) located outside of the region; Average Funding Within Region = Average federal obligations for universities with same type of Carnegie (1994) Classification located in the same region as the university under study; Regional Trend Effect = Dummy Variable indicating which region (out of 9) the university under studied is located interacted with a dummy variable for public and private universities and a year indicator; University Fixed Effects with a Time Trend = set of university dummy variables + set of university dummy variables interacted with a year indicator

Table 3: Role of Politics on Federal Research Funding: Alma Mater Affiliation

Dependent Variable: Annual Federal Funding (2 yr average)	Private=Public				Private=Public				# of Schools	
	(1)	Public (2a)	Private (2b)	F-test (2c)	(3)	Public (4a)	Private (4b)	F-test (4c)	Public	Private
Senate Appropriations										
At Least 1 SubCommittee Chair	-3.36 (1.51)	-4.17 (1.80)	-0.33 (2.87)	1.24 (0.27)					20	8
General Member	-1.71 (1.22)	-2.00 (1.65)	-2.66 (1.83)	0.07 (0.79)					27	11
Tenure < 4 years					-2.39 (1.35)	-3.11 (1.73)	-3.75 (1.86)	0.07 (0.80)	27	11
Tenure 4-11 years					-5.28 (1.30)	-6.16 (1.78)	-5.08 (1.81)	0.18 (0.67)	22	9
Tenure 11+ years					-2.23 (1.79)	-5.33 (2.44)	2.33 (2.91)	4.20 (0.04)	11	5
House Appropriations										
At Least 1 SubCommittee Chair	8.33 (2.15)	7.90 (2.65)	8.41 (3.83)	0.01 (0.91)					14	6
General Member	1.97 (0.88)	4.94 (0.96)	-4.94 (1.60)	27.78 (0.00)					40	18
Tenure < 4 years					2.59 (1.06)	4.44 (1.09)	-4.29 (2.17)	13.07 (0.00)	40	18
Tenure 4-11 years					2.66 (0.94)	5.17 (1.00)	-4.80 (1.73)	25.38 (0.00)	30	15
Tenure 11+ years					11.09 (1.87)	18.31 (2.33)	-8.96 (2.65)	69.45 (0.00)	16	9
F-test on All Political Measures (p-value)	11.37 (0.00)		9.68 (0.00)		9.06 (0.00)		9.22 (0.00)			
District/ Representation	2.82 (0.82)		3.22 (0.81)		2.77 (0.82)		3.12 (0.80)			
Average Funding Outside of Region	0.81 (0.07)		0.79 (0.06)		0.80 (0.07)		0.87 (0.06)			
Average Funding Within Region	0.08 (0.07)		0.10 (0.07)		0.07 (0.07)		0.02 (0.07)			
University Fixed effects	Yes		Yes		Yes		Yes			
Regional Trend Effect	Yes		Yes		Yes		Yes			
# of Observations	1727		1727		1727		1727			
# of Schools	73		73		73		73			
R-Squared	0.9626		0.9634		0.963		0.9647			

Note: Robust Standard Errors in Parenthesis, Except Where Noted; see notes to Table 2

Appendix Table 1: List of Universities Studied

Universities With District and Alma Mater Affiliations	State	Carnegie Class
University of Alabama	AL	D1
University of Arkansas	AR	R2
University of Arizona	AZ	R1
Stanford University	CA	R1
University of California-Los Angeles	CA	R1
Yale University	CT	R1
University of Florida	FL	R1
University of Georgia	GA	R1
University of Hawaii at Manoa	HI	R1
Iowa State University	IA	R1
Northwestern University	IL	R1
University of Chicago	IL	R1
Purdue University	IN	R1
University of Kentucky	KY	R1
University of Louisville	KY	R2
Tulane University	LA	R1
Mississippi State University	MS	R2
University of Mississippi	MS	R2
North Dakota State University	ND	D2
University of Nebraska at Lincoln	NE	R1
Dartmouth College	NH	D2
Princeton University	NJ	R1
Rutgers University	NJ	R1
University of New Mexico	NM	R1
University of Nevada-Reno	NV	D2
Columbia University	NY	R1
Cornell University	NY	R1
Syracuse University	NY	R2
Case Western Reserve University	OH	R1
Oklahoma State University	OK	R2
Pennsylvania State U	PA	R1
University of Pennsylvania	PA	R1
Vanderbilt University	TN	R1
University of Utah	UT	R1
University of Washington - Seattle	WA	R1
Washington State University	WA	R2
University of Wisconsin-Madison	WI	R1
Arizona State University	AZ	R1
San Diego State University	CA	D2
California Institute of Technology	CA	R1
University of California-Berkeley	CA	R1
University of Connecticut	CT	R1
Indiana State University	IN	D2
Indiana University	IN	R1
University of Notre Dame	IN	R2
Boston College	MA	D1
Harvard University	MA	R1
University of Maryland at College Park	MD	R1
University of Minnesota	MN	R1
University of Missouri, Columbia	MO	R1
University of New Hampshire	NH	D2
Rensselaer Polytechnic Institute	NY	R2
SUNY at Albany	NY	R2
University of Oklahoma	OK	R2
University of Oregon	OR	R2
University of Pittsburgh	PA	R1
Middle Tennessee State University	TN	D2
Baylor University	TX	D2
Texas A&M University	TX	R1
University of Texas at Austin	TX	R1
University of Houston	TX	R2
Utah State University	UT	R1
Universities with District Representation Only		
University of Alaska, Fairbanks	AK	D2
University of Alabama in Huntsville	AL	D2
University of Alabama at Birmingham	AL	R1
Auburn University	AL	R2
Northern Arizona University	AZ	D1
Loma Linda University	CA	D2
Pepperdine University	CA	D2
University of San Diego	CA	D2
University of San Francisco	CA	D2

University of the Pacific	CA	D2
University of California-Davis	CA	R1
University of California-Irvine	CA	R1
University of California-San Diego	CA	R1
University of California-San Francisco	CA	R1
University of California-Santa Barbara	CA	R1
University of Southern California	CA	R1
University of California-Riverside	CA	R2
University of California-Santa Cruz	CA	R2
Colorado School of Mines	CO	D2
Florida Institute of Technology	FL	D1
Nova Southeastern University	FL	D1
Florida Atlantic University	FL	D2
Florida International University	FL	D2
University of Central Florida	FL	D2
Florida State University	FL	R1
University of Miami	FL	R1
University of South Florida	FL	R2
Clark Atlanta University	GA	D1
Georgia State University	GA	D1
Emory University	GA	R1
Georgia Institute of Technology	GA	R1
University of Iowa	IA	R1
Idaho State University	ID	D2
University of Idaho	ID	R2
Loyola University of Chicago	IL	D1
University of Illinois at Chicago	IL	R1
Ball State University	IN	D1
Louisiana Tech University	LA	D2
University of Southwestern Louisiana	LA	D2
Louisiana State University	LA	R1
Clark University	MA	D2
University of Massachusetts Lowell	MA	D2
Worcester Polytechnic Institute	MA	D2
Boston University	MA	R1
Massachusetts Institute of Technology	MA	R1
Tufts University	MA	R1
University of Massachusetts at Amherst	MA	R1
Brandeis University	MA	R2
Northeastern University	MA	R2
University of Maryland Baltimore County	MD	D2
Johns Hopkins University	MD	R1
University of Michigan	MI	R1
University of Missouri, Kansas City	MO	D1
University of Missouri, Rolla	MO	D1
University of Missouri, St Louis	MO	D2
Washington University	MO	R1
St Louis University	MO	R2
University of Southern Mississippi	MS	D1
Montana State University - Bozeman	MT	D2
University of Montana	MT	D2
University of North Dakota	ND	D2
New Jersey Institute Technology	NJ	D2
Seton Hall University	NJ	D2
Stevens Institute of Technology	NJ	D2
New Mexico State University	NM	R1
Adelphi University	NY	D1
CUNY Graduate School and University Center	NY	D1
Fordham University	NY	D1
Hofstra University	NY	D1
New School for Social Research	NY	D1
Polytechnic University	NY	D1
SUNY at Binghamton	NY	D1
St John's University (Jamaica, NY)	NY	D1
Clarkson University	NY	D2
Pace University	NY	D2
New York University	NY	R1
Rockefeller University	NY	R1
SUNY at Buffalo	NY	R1
SUNY at Stony Brook	NY	R1
University of Rochester	NY	R1
Yeshiva University	NY	R1
University of Toledo	OH	D1
Cleveland State University	OH	D2
Ohio University	OH	R2

University of Tulsa	OK	D2
Portland State University	OR	D2
Oregon State University	OR	R1
Drexel University	PA	D1
Indiana University of PA	PA	D1
Allegheny University of the Health Sciences	PA	D2
Duquesne University	PA	D2
Carnegie Mellon University	PA	R1
Temple University	PA	R1
Lehigh University	PA	R2
Brown University	RI	R1
University of Rhode Island	RI	R2
Clemson University	SC	R2
University of South Carolina	SC	R2
University of South Dakota	SD	D1
University of Memphis	TN	D1
Tennessee State University	TN	D2
University of Tennessee at Knoxville	TN	R1
Southern Methodist University	TX	D1
Texas Woman's University	TX	D1
University of North TX	TX	D1
University of Texas at Arlington	TX	D1
University of Texas at Dallas	TX	D1
Texas Christian University	TX	D2
Texas Southern University	TX	D2
Rice University	TX	R2
Texas Tech University	TX	R2
Brigham Young University	UT	R2
George Mason University	VA	D2
University of Virginia	VA	R1
University of Vermont	VT	R2
Marquette University	WI	D1
University of Wisconsin-Milwaukee	WI	R2
West Virginia University	WV	R1
University of Wyoming	WY	R2
Universities with Alma Mater Affiliation Only		
University of Denver	CO	D1
University of Colorado	CO	R1
Georgetown University	DC	R1
Howard University	DC	R1
Wichita State University	KS	D2
Kansas State University	KS	R2
Michigan State University	MI	R1
Wake Forest University	NC	D2
University of North Carolina at Chapel Hill	NC	R1
College of William and Mary	VA	D1
Virginia Polytechnic Institute and State University	VA	R1
Universities with No Affiliation		
Claremont Graduate School	CA	D1
United States International University	CA	D1
Biola University	CA	D2
University of La Verne	CA	D2
University of Northern Colorado	CO	D1
Colorado State University	CO	R1
American University	DC	D1
Catholic University of America	DC	D1
George Washington University	DC	R2
University of Delaware	DE	R2
Illinois Institute of Technology	IL	D1
Illinois State University	IL	D1
Northern Illinois University	IL	D1
De Paul University	IL	D2
University of Illinois at Urbana-Champaign	IL	R1
Southern Illinois University-Carbondale	IL	R2
University of Kansas	KS	R1
University of Maine	ME	D2
Andrews University	MI	D1
Western Michigan University	MI	D1
Michigan Technological University	MI	D2
University of Detroit Mercy	MI	D2
Wayne State University	MI	R1
University of North Carolina at Greensboro	NC	D1
Duke University	NC	R1
North Carolina State University at Raleigh	NC	R1
Bowling Green State University	OH	D1

Miami University	OH	D1
University of Akron	OH	D1
Wright State University	OH	D2
Ohio State University	OH	R1
University of Cincinnati	OH	R1
Kent State University	OH	R2
Old Dominion University	VA	D1
Virginia Commonwealth University	VA	R1

Appendix Table 2: Regressions for District Representation, with University Time Trend

Dependent Variable: Annual Federal Funding (2 yr average)	Private=Public				Private=Public			
	(1)	Public (2a)	Private (2b)	F-test (2c)	(3)	Public (4a)	Private (4b)	F-test (4c)
Senate Appropriations								
At Least 1 SubCommittee Chair	0.47 (0.61)	0.35 (0.34)	0.64 (2.36)	0.01 (0.90)				
General Member	0.58 (0.45)	1.38 (0.31)	-0.95 (1.16)	6.84 (0.01)				
Tenure < 4 years					0.70 (0.49)	1.74 (0.36)	-1.42 (1.27)	5.66 (0.02)
Tenure 4-11 years					0.89 (0.53)	1.34 (0.34)	-0.16 (1.30)	1.27 (0.26)
Tenure 11+ years					0.48 (0.53)	1.20 (0.54)	-0.73 (1.11)	2.55 (0.12)
House Appropriations								
At Least 1 SubCommittee Chair	-1.19 (1.30)	1.54 (1.07)	-4.63 (2.11)	3.73 (0.05)				
General Member	-0.74 (0.45)	-2.49 (0.81)	0.75 (0.59)	10.51 (0.00)				
Tenure < 4 years					-0.34 (0.51)	-2.04 (0.85)	1.23 (0.76)	8.19 (0.00)
Tenure 4-11 years					-1.75 (0.69)	-4.95 (1.31)	0.05 (0.87)	10.09 (0.00)
Tenure 11+ years					1.45 (0.78)	2.49 (1.03)	0.03 (1.17)	2.52 (0.11)
F-test on All Political Measures (p-value)	1.89 (0.11)		5.19 (0.00)		2.71 (0.01)		5.21 (0.00)	
District/Alma Mater Representation*	-2.29 (0.63)		-2.44 (0.63)		-2.30 (0.63)		0.60 (0.08)	
Average Funding Outside of Region	0.60 (0.08)		0.60 (0.08)		0.60 (0.08)		0.60 (0.08)	
Average Funding Within Region	0.30 (0.05)		0.30 (0.05)		0.30 (0.05)		0.29 (0.05)	
# of Observations	4259		4259		4259		4259	
# of Schools	181		181		181		181	
R-Squared	0.9843		0.9843		0.9843		0.9844	

Appendix Table 3: Regressions for Alma Mater Affiliation, with University Time Trend

Dependent Variable: Annual Federal Funding (2 yr average)	Private=Public				Private=Public			
	(1)	Public (2a)	Private (2b)	F-test (2c)	(3)	Public (4a)	Private (4b)	F-test (4c)
Senate Appropriations								
At Least 1 SubCommittee Chair	1.34 (0.83)	0.22 (0.91)	4.62 (1.74)	4.99 (0.03)				
General Member	-1.01 (0.67)	0.12 (0.85)	-3.12 (1.12)	5.29 (0.02)				
Tenure < 4 years					-0.38 (0.70)	1.11 (0.89)	-3.56 (1.13)	10.58 (0.00)
Tenure 4-11 years					-2.28 (0.73)	-1.62 (0.99)	-3.55 (1.06)	1.82 (0.18)
Tenure 11+ years					2.01 (0.95)	1.88 (1.30)	2.13 (1.53)	0.02 (0.90)
House Appropriations								
At Least 1 SubCommittee Chair	3.82 (1.77)	3.33 (2.08)	3.48 (3.28)	0.00 (0.97)				
General Member	-1.01 (0.54)	0.07 (0.61)	-3.58 (1.05)	9.12 (0.00)				
Tenure < 4 years					-0.33 (0.64)	0.84 (0.70)	-3.82 (1.43)	8.57 (0.00)
Tenure 4-11 years					-1.77 (0.64)	-1.15 (0.72)	-3.69 (1.40)	2.65 (0.10)
Tenure 11+ years					1.69 (1.13)	2.14 (1.28)	-1.59 (2.50)	1.75 (0.19)
F-test on All Political Measures (p-value)	2.91 (0.02)		3.04 (0.00)		6.06 (0.00)		4.11 (0.00)	
District/Alma Mater Representation*	1.92 (0.55)		1.84 (0.56)		1.94 (0.54)		1.87 (0.55)	
Average Funding Outside of Region	0.88 (0.07)		0.86 (0.07)		0.87 (0.07)		0.86 (0.07)	
Average Funding Within Region	0.28 (0.07)		0.31 (0.06)		0.27 (0.07)		0.29 (0.06)	
# of Observations	1727		1727		1727		1727	
# of Schools	73		73		73		73	
R-Squared	0.988		0.9881		0.9881		0.9882	