

The Role of Economic Reliance in Defense Procurement Contracting

Rebecca U. Thorpe*

Abstract:

Applying an original dataset, this paper examines how a highly concentrated defense sector presence in sparsely populated areas influences 1) House defense committee assignments and 2) defense procurement allocations from 1999-2006. While extant evidence suggests that prime contracts typically funnel to headquarter locations, my emphasis on a conditional relationship between industrial composition and rural geography also reveals the broad distribution of defense contract benefits to more economically reliant Congressional districts. This analysis identifies disproportionate constituency dependence on the defense sector as the most important factor leading Congress members to seek representation on defense committees and to procure defense benefits. Evidence suggests that local dependence on the defense industry reinforces political relationships that contribute to inefficiency and excess in weapons contracting.

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“The [defense] contract goes to a subcontractor, which goes to another subcontractor, and a fourth-level subcontractor. And the payment for air conditioning [in Iraq] turns out to be payments to four contractors, the fourth of which puts a fan in the room. Yes, the American taxpayer paid for an air conditioner and, after the money goes through four hands, there is a fan put in a room in Iraq.”

-S. Byron Dorgan (D-ND), (*Congressional Record*, S.AMDT 4230, 2006)

“[Defense contracting] has become a requirements stampede. What we’ve been doing is analogous to someone who is designing a home and gives their architect all the must-haves and like-to-have and then is billed \$300 per square foot.”

-R. Duncan Hunter (R-CA), Armed Services Committee Chairman (*Congress Daily*, 5/5/2005)

Senator Dorgan’s horror story about the defense contracting debacle in Iraq provides a characteristic (if not extreme) illustration of the inefficiency in the Congressional “requirements stampede” that Representative Hunter laments. The connection between Congressional micromanagement and subcontracting decisions is not immediately evident. However, the relationship becomes clear when one considers the extent to which key Congress members seek defense benefits for their constituencies, while the defense industry simultaneously works to stimulate a political demand for weapons systems by spreading subcontract benefits as widely as possible.

Inefficiency and waste in defense contract allocations does not escape the attention of commentators and concerned citizens. In recent decades, critics have furiously derided the U.S. defense arsenal as wasteful profiteering and an “abuse of national security dollars,” trumpeting demands for disgusted taxpayers to “rap the industry on the snout” (*Democracy Arsenal* 6/22/2006). Individual Congress members themselves have often advocated cutbacks in high cost, low reliability weapons systems. For example, one prominent member of the Armed Services committee and Defense Appropriations subcommittee acknowledges that, in reference to the Cold War era DDX destroyer, “there is no threat out there for most of the new technologies we’ve been

developing” (R. Bartlett (R-MD), *Congressional Record*, 2006). A recent House Armed Services Committee Report echoes its critics’ sentiments, expressing deep “[concern] with skyrocketing costs of weapons that cannot be explained by inflation or reduced economics of scale” (FY2007, Armed Services Cmte Report).

Given the recent criticism expressed for excessive government spending on defense procurements and related research and development investments, the 2006 fiscal year defense budget that Congress passed ought to generate heightened concern. While the House reduced funding for several of the Administration’s desired programs (including the DDX destroyer), it approved spending \$79.1 billion on weapons procurement-- \$1 billion more than the Pentagon originally requested. After cutting back many of the Administration’s requests, Congress included an extra \$3 billion for (often equally controversial) programs and projects (see H.R.1815; *Defense Industry Daily* 5/27/2006).

Despite conventional wisdom that politics play an important role in defense spending, political scientists have found little evidence that defense contracts are distributed to advance Congress members’ reelection interests. Instead, political scientists generally find that prime defense contracts¹ are awarded to a limited number of highly concentrated locations with corporate defense headquarters, usually in large cities (Markuson et al. 1991; Mayer 1991). Not surprisingly, analyses considering whether the Department of Defense (DOD) targets contracts into the districts or states of influential legislators— particularly those on the Armed Services committee and Defense Appropriations subcommittee —have yielded almost uniformly negative results

¹ Prime defense contracts refer to the military procurements awarded by federal agencies. Secondary contracts (or subcontracts) occur when prime contractors or defense industry management award contracted weapons systems to another location or company. (I use the terms ‘prime’ and ‘primary’ interchangeably.)

(Rundquist 1973; Lindsay 1991; Mayer 1991; Markuson et al., 1991, 40; but also see Rundquist & Carsey 2002). This research track generally leads to unconvincing explanations of why Congress has no influence on how the DOD distributes benefits. The predominant location of defense industry headquarters in central, urban areas makes pork barrel theories especially difficult to demonstrate. These findings appear to contradict the notion that Congress members align with Pentagon officials and defense sector management in pursuit of mutually entangled benefits.

This research reconsiders the role of politics in driving defense spending. I argue that members representing districts that are disproportionately reliant on defense employment are more likely to seek defense procurements than other members. Rural areas with less diverse economies stimulate greater political incentive to procure defense dollars. I analyze the role of economic reliance in the distribution of defense benefits by tracking the prime contracts to the subcontracting level, where the preponderance of defense dollars eventually go. In doing so, my approach offers a more complete picture of the factors fueling the defense procurement ‘stampede’ and propelling what one scholar coins the ‘permanent war economy’ (Melman 1974).

I collected original data on nation-wide locations of defense facilities in order to assess the impact of a concentrated defense sector presence in rural areas that are disproportionately reliant on defense employment. This analysis identifies dependence on the defense sector as the most important factor leading members to seek representation on defense committees and to procure defense dollars. The analysis takes place in three parts: First, the findings demonstrate that the geographic composition of the defense sector predicts defense committee composition in the House. Second, I find that while

defense industry headquarters receive the bulk of prime contract dollars, key committee members and economically dependent districts procure greater numbers of prime contract assignments. Third, my focus on a secondary stage in the contracting process—as opposed to previous academic work— further magnifies a striking pattern of defense projects flowing to economically reliant districts.

Previous scholars' emphasis on the allocation of prime defense contract dollars conceals political factors driving the distribution of defense benefits. My findings suggest that members of Congress primarily work to acquire greater numbers of defense projects, while imposing additional subcontracting stages in weapons development projects. The findings are also consistent with the inference that defense industries curry political favor by spreading out their operations across multiple districts. Unnecessarily protracted contracting processes presumably help keep local economies afloat, but also reinforce local dependence on the defense sector. Perversely, these contracting inefficiencies actually help stimulate greater political demand for weapons systems. Taken in the aggregate, the consequences for national policy are likely to be both excessive weapons spending and an inability to prioritize defense expenditures in pursuit of strategic national goals. Local dependence on the defense industry reinforces the political relationships and incentives that result in inefficiency and excess.

Evidence suggests that congressional actors play an instrumental role, facilitating— but not independently driving-- the 'requirements stampede' that characterizes defense procurement policies. The engine fueling the war industry runs on a set of structurally and institutionally entrenched goals— employment, revenue, and personal job security--

shared among key congressional actors, high-level Defense Department bureaucrats, defense industry management, and key constituencies.

A THEORY OF OVERLAPPING ECONOMIC INCENTIVES

Defense contract decisions filter through numerous political networks. The Pentagon proposes the initial defense budget requests and submits these requests to Congress. The President's bill goes to the House and Senate Defense Appropriation Subcommittees, which debate and amend various provisions. The subcommittees then submit the amended bill to Congress for final budgetary authorization. In an overlapping sphere, the Armed Services Committees authorize all funds and conditions for their expenditure, and report needs for specific weapons and research and development (R&D) to the DOD. The Pentagon determines the final authorization for necessary weapons production and research grants within the limits of their budgetary authorization. Prime contractors then work with defense industry management to distribute an array of assignments to facilities or subcontract projects out to other companies. This includes decisions concerning the principal location for the construction of contracted weapons systems. The reciprocal incentives motivating Congress, key members assigned to defense committees, the defense bureaucracy, and the defense sector—revenue, employment, and personal job security—drive the distribution of defense procurement outlays.

Committee Processes

Constituents want jobs, organized lobbyists and corporations desire revenue, and political actors seek to facilitate these demands for the sake of both personal and

collective gain. The committee system serves as a prominent vehicle by which Congress members seek to prioritize these goals and optimize their ability to claim credit to their constituents during a reelection campaign (Fiorina 1987; Weingast and Marshall 1988; Shepsle and Weingast 1994). Congress members on defense committees demonstrate a concern for local interests by vying for constituency benefits (Weingast and Marshall 1988; Shepsle and Weingast 1994).

These district benefits fit the definition of distributive policy, a term which Lowi (1964, 690) describes as benefits that can be disaggregated and dispensed “unit by unit, more or less in isolation from other units and from any general rule.” Distributive policies typically benefit small, concentrated areas while imposing widespread, general costs. Analyses of Congress dominate the field of distributive politics, where the geographic and economic differentiation of states and districts create natural conditions for log-rolling behavior. Such arrangements beg for analyses explaining variation across multiple types of policy outcomes (see Evans 1994).

Early analyses of defense committees find that the Armed Services Committee draws Congress members from districts with large military bases and high levels of employment in arms services (Goss 1972; Arnold 1979; Rodhe & Schepsle 1973). Both committee-based log-rolling arrangements (Ray 1980; Carsey & Rundquist 1997) and partisan influences (Bickers and Stein 2000; Carsey & Rundquist 1999; Rundquist & Carsey 2002) contribute to cross-sectional disparities in the distribution of defense-related benefits.

Adler & Lapinski’s (1997) test of their “demand-side” theory of committee composition confirms that the Armed Services Committee attracts Congress members

from districts with a disproportionately high concentration of military bases. The constituency 'need' scores from committee member districts were almost always significantly higher than those from the rest of the floor, thus empowering the most reliant members with the charge of policy-making. Adler & Lapinski's (1997) study provides evidence that external social and economic constituency characteristics shape Congressional processes. However, the authors also note that, "Absent from the profile of high need districts for Armed Services is a measure of civilian employees of military contractors" (901). The authors' rationale for the exclusion points to the "[practical] impossibility" of collecting reliable employment data related to defense contractors and subcontractors for each Congressional district across multiple decades.

While this task would surely be remarkably taxing-- if not impossible—the omission also leaves a considerable void, and a less ambitious research design might help mitigate arduous data collection. Defense contracting constitutes a multi-billion dollar industry—in excess of \$150 billion in the 2006 fiscal year. The immense size of the defense industry and its impact on GDP and employment suggests that the commercial defense sector exerts an even more substantial impact over Congress members' priorities than military personnel. Defense procurement and R&D contribute an estimated 3.6 million U.S. jobs in the private sector (Thomson 1998). Further, these figures actually understate the true weight of the military industry in the U.S. economy. The reported budget of the Department of Defense does not include: the Department of Energy's spending on nuclear weapons (\$16.4 billion slated for fiscal 2006) or the Department of Homeland Security's outlays for the actual "defense" of the United States (\$41 billion).

Nor does it include the billions of dollars the Department of State spends each year to finance foreign arms sales and militarily related development and private arms sales.

My data allow for an examination of the impact of the commercial arms industry on defense committee composition. The analysis highlights a new theory of district demand based on the geographic composition of industry. While Adler & Lapinski measure district 'need' based on the number of military bases in a district, I conceptualize *excessive demand* based on the relative *concentration* of the defense industry in a district. In other words, Congress members from more sparsely populated, rural districts with a more homogenous defense sector presence will operate differently than members from urban districts with defense industries scattered amongst a diverse industrial base.

Members from rural areas with less diverse economies will exhibit greater likelihood to join defense committees than their urban counterparts for a variety of reasons. First, Congress members receive greater visibility in small towns eager to publish grant announcements. Rural settings facilitate members' ability to noticeably claim credit for acquiring projects that bolster local employment opportunities. Second, benefits concentrate within a single district, as opposed to multiple districts spread across city limits. The concentration of benefits in one district diminishes well-known collective action problems that members competing for credit commonly face. Finally, and perhaps most critically, the relative impact of contract benefits in rural areas exceeds that of more industrious areas, as the status of a major industry in a rural setting or small town could spur or wreck a local economy (see Arnold 1979, 34).

The theory of excessive demand suggests that members from more industrially homogenous areas will place a greater premium on maintaining defense employment

levels than Congress members from diverse urban centers with otherwise thriving industrial capacity. The data introduced in this study also provide a more precise measure capturing the district-wide presence of the defense sector. While Carsey & Rundquist (2002) find that the manufacturing capacity of a district influences defense committee composition, this measurement fails to distinguish locations with a relatively homogenous defense sector presence from diverse manufacturing economies. The theory that economic dependence motivates defense committee composition leads to the following hypothesis:

H1: Congress members from districts that are more dependent on defense employment will demonstrate a greater likelihood to join defense committees than Congress members from other districts.

The Geographic Structure of the Defense Industry: Capacity v Need

Do Congressional processes influence the distribution of contract benefits? While Hall (1996, 1987) found that different levels of committee participation correspond with Congress members' revealed 'preference intensity,' this analysis provides an initial attempt to assess whether an interested bias affects policy outcomes. If preference intensity influences committee processes *and* contract allocations, then benefits will funnel to the most economically dependent constituencies.

This theory suggests that geographic, industrial and political factors will all affect defense contracting. However, the process of causality is incredibly difficult to untangle. Two main theories currently guide the literature, which I classify as economic *need* verses industrial *capacity*. On one hand, textbook economic logic implies that an effort to drive down production costs will place a premium on facilities in more remote location sites. Strategic concerns held by Pentagon officials— secrecy, security, and proximity to

military bases—align with this calculus. The theory of economic need suggests that facilities cluster within sparsely populated locations across the ‘Gunbelt’ (Markuson et al., 1991, referring to the Sunbelt regions of the South and West), increasing economic dependence on the defense market for employment dividends in these regions.

On the other hand, because the government maintains a virtual monopoly on legal purchasing power of most products manufactured by the defense industry, a contending argument suggests that the defense sector prioritizes quality and efficiency with little concern for cost effectiveness (Markuson et al., 1991; Melman 1974). Rather than mobilizing manufacturing sites with the goal of decreasing labor costs, the defense market agglomerates around corporate locations in predominately urban regions. The theory of industrial *capacity* suggests that corporate headquarters in urban areas receive the bulk of defense contracting dollars. Wealthy areas accumulate revenue while Congressional efforts to stave off economic downfalls in less industrious, more dependent localities meet with limited success (see Markuson et al. 1991).

Both views suggest that geography influences politics. Distributive politics literature points to cross-sectional disparities in defense contracting (Stein & Bickers 1995), explained in part by uneven industrial capacity across various geographic regions. One team of researchers argue that defense contracting produced a “new economic map of the United States”, where “regions and metropolitan areas that have disproportionately gained are strung unevenly around America’s perimeter, from Washington state through California, Texas and the Great Plains, across to Florida, and discontinuous up the East Coast to New England.” The lack of Pentagon dollars contributed to the industrial decline in large sections of the Rustbelt in Middle America (Markuson et al, 1991, 3).

Much of the distributive politics literature focuses on members' political incentives. For example, Lee (2000, 2003) shows how House members' political needs create distinct patterns in the geographic distribution of program benefits and that Senate representation creates additional inequalities. Other research demonstrates that spatial proximity leads to greater political activism among geographically concentrated industries with shared interests (Busch & Reinhardt 1999, 2000).

Nevertheless, early studies focusing on defense procurement outlays suggest that geography and politics may not influence outcomes: constituencies do not reap considerable benefits from representation on defense committees (Rundquist & Griffith's 1976; also see Goss 1972; Rundquist 1978; Rivers 1969). Instead, some studies of congressional votes on weapons spending argue that ideology, not parochialism, drives members' defense spending preferences (Mayer 1991; Lindsay 1991). If this is the case, industrial capacity displaces both political influence and district need in the distribution of primary contract dollars (Mayer 1991).

Rundquist & Carsey (2002) posit a reciprocal relationship between industrial composition and political influence. Utilizing data spanning across two decades at both the state and district level, these authors find that a higher state manufacturing capacity encourages defense committee membership; in turn, majority party members with defense committee assignments channel contract benefits to their constituencies. While the researchers highlight the role of political influence, they provide little evidence that economic need either motivates congressional involvement or influences the flow of contract dollars.

The theory presented here recognizes the role of economic *capacity* in the distribution of prime defense dollars, and emphasizes the impact of district *need* in the broad dissemination of primary and secondary contract assignments. The findings suggest that a defense sector presence in rural locations—characterized by relatively homogeneous industrial composition (Gilbert 1982)—spurs a uniquely high political demand for weapons programs. Despite diminishing differences between rural and urban areas in terms of ideology and values, scholars continue to point to uneven development patterns (Gilbert 1982) and persistent economic disparities (Buttel & McMichael 1988, 97).² While primary procurement outlays presumably flow to wealthier, more urban areas with defense industry headquarters, a disproportionate reliance on defense employment in more rural areas suggests that additional benefits will ‘trickle down’ to these dependent regions.

The flurry of negative findings concerning the impact of economic need in defense contracting does not capture the true effect of geography, but points to a problem of academic emphasis: Geographic, industrial and political factors do not adequately capture a district’s economic reliance on the defense sector independently of one another. For instance, while lower state GDP may indicate greater economic need, this fails to correspond with a specific need for defense expenditures.³ Rather, a conditional relationship between rural geography and a high defense sector concentration provides a

² For example, in Madison County Alabama, residents rely on defense spending for an estimated 50, 694 jobs, accounting for 29.4% of all wage and salary jobs in the county, which primarily concentrate in Huntsville (see <http://www.ci.huntsville.al.us>). The relatively homogenous defense sector presence in this region is more likely to stimulate demand for weapons programs than a thriving urban center, like New York City, where the defense sector exists amongst thousands of other industries that employ hundreds of thousands of residents.

³ Carsey & Rundquist (2002) utilize this measure to refute the influence of economic need in defense contracting. However, they also supply additional evidence that committee members successfully direct defense procurement benefits to their districts.

more precise measure of a district's economic reliance on defense projects. The following hypotheses examine a conditional theory of economic need, and corresponding congressional influence in defense contracting:

H2: Prime contracts will channel to districts with a high concentration of defense facilities if the district is more industrially homogenous.

H3: Prime contracts will channel to districts with defense committee representation.

Previous academic work focusing solely on prime defense contract allocations may also conceal political factors. Evidence suggests that the Pentagon may be limited in the extent to which it can distribute prime contracts politically. Prime contractors, however, face no such constraints and purposely spread subcontracts for large defense programs over as wide a geographic area as possible, commonly including more than 45 states and 250 congressional districts, by one researcher's count (see Mayer 1991, 9). Prime contractors look to subcontractors to supply parts, accessories, or technical services for weapons programs. The incentive is to give as many congressional members as possible some economic stake in a program.

In *The Politics of Military Procurement*, Mayer (1991) concludes that primary defense contract outlays are relatively immune from direct political influence, but also contrasts the selection of prime contractors with the selection of subcontractors or suppliers. While a wide distribution of subcontracts will not guarantee a program's survival, broad economic distribution can place a weapon system on the congressional agenda—a position it might not otherwise occupy. The academic preoccupation with primary contract allocations traces back to a lack of reliable subcontracting data (Markuson et al. 1991, 14). Nonetheless, previous research focusing exclusively on

political influences on primary contract awards misses critical dissemination stages, and is therefore only crudely suggestive.

Information recently made available on the Federal Procurement Data System allows for a new examination of the politics of defense contracting. The data system includes the ‘principal place of performance’ in which a contracted weapon system is built, identifying one type of contract benefit disseminated after the primary contract arrangement. The following hypotheses provide a test of economic need and political influence in acquiring these district benefits:

H4: Secondary contract benefits will channel to districts with a high concentration of defense facilities if the district is more industrially homogenous.

H5: Secondary contract benefits will channel to districts with defense committee representation.

RESEARCH DESIGN

I constructed an original dataset on the geographic composition of the defense sector in order to test effect of the geographic composition of industry on 1) defense committee membership in the House and 2) defense procurement outlays from 1999-2005. The data offer the first attempt (to the best of my knowledge) to systematically assess the role of disproportionate district demand in the dissemination of defense benefits. This time period offers an appropriate framework for a foundational assessment for several reasons: The 106th, 107th, 108th, and 109th Congresses capture periods of both divided and unified government, as well as a period of relative peace before the abrupt need to heighten national security in the wake of September 11, 2001. In addition, this

time period permits me to address concerns about congressional pork barreling in matters of defense and national security spending in the post 9-11 context.

The House of Representatives serves as the focal point (as opposed to the Senate or executive branch) because House districts create smaller units of analysis that allow for a more precise test of the theory. Congressional districts—while more difficult to operationalize from a methodological standpoint—not only offer a larger selection of cases than the Senate, but also provide a more accurate measure of a *highly concentrated* industrial sector. A senator from California is less likely to respond to economic pressures concentrated in Antelope Valley (a once-rural, turned capital air force industry located in Los Angeles county) than a Congress member with a key constituency made up of 40% aerospace workers.⁴

If the geographic composition of industry influences political demand, then a high concentration of defense facilities in more industrially homogenous locations will influence 1) defense committee membership and 2) the distribution of contract benefits. To test this theory, I first examine whether the geographic structure of the defense industry impacts House defense committee assignments. I also test the theory of disproportionate district need based on a conditional relationship between rural geography and a high defense sector concentration in the distribution of prime defense contracts. Finally, the analysis assesses the role of disproportionate district need in the dissemination of secondary defense benefits. Since prime defense benefits often channel to locations with corporate headquarters (Markuson et al. 1991), a count variable capturing defense industry headquarters controls for these allocations.

⁴ For a more complete profile, see www.rut.com/mjalbert/AntelopeValley/04.html.

Defense procurement allocations operate as the dependent variable. Aggregating primary contract data is relatively easy. Accessing the Federal Procurement Data System (www.fpds.gov), I gathered data on defense contracts awarded to Lockheed Martin, Boeing, Raytheon, Northrop Grumman, General Dynamics and SAIC from 2000-2005, and transformed the data to the district level for each relevant congressional term.⁵ This includes the top five defense companies measured by both defense contract dollars and total annual revenue, according to Washington Technology and Source Watch. Science Applications International Corporation (SAIC)—ranked the #8 U.S. defense company—is also included to account for an industry that, according to one source, lacks otherwise typical traces of influence peddling in procurement awards.⁶ These six defense companies employ at least 600,000 people and collectively account for 54.3% of the total defense contract dollars spent on procurements and R&D (based on 2003 data).⁷ The dataset provides measures for the total defense procurement dollars received and the total number defense procurement contracts awarded per district. (For information on primary contract allocations, see Appendix A.)

Collecting data on disseminated defense procurement benefits proved much more challenging. While the FPDS provides information on the “principal place of performance”—or the designated location where the weapons system was built—the data

⁵ The model focuses on the 50 states, excluding foreign nations, and non-state entities (e.g., Washington DC, Puerto Rico, and American Samoa.)

⁶ Nearly 75% of SAIC’s defense contracting dollars result from full and open processes, as opposed to 6.3% that are privately negotiated (based on 1998-2003 data).

(<http://www.publici.org/pns/db.aspx?act=cinfo&coid=054781240>)

(But see <http://www.niagarafallsreporter.com/hanchette241.html>;

<http://www.vanityfair.com/politics/features/2007/03/spyagency200703>

for an argument that SAIC gets around these processes by “[exploiting] conflicts of interests in Washington” by hiring top federal officials.)

⁷ The FY2003 defense budget for \$355.4 billion allocated \$122.2 billion for procurement and research and development expenditures. Of this \$122.2 billion, Lockheed Martin, Boeing Company, Raytheon, Northrop Grumman, General Dynamics and Science Applications International accrued \$66.447 billion, or 54.38%. (For employment and total contracting data, refer to washingtontechnology.org and sourcewatch.org.)

is classified by city. Broad city-level data are not particularly suitable for more specified, district-level variables. In order to compensate for this problem, I coded 3,506 principal locations in the years 1999-2000 and 2005, utilizing both congressional district atlases and the Geographic Information System (GIS). This method accounts for 98% of all principal locations in the relevant years (4489/4581), allowing for a preliminary assessment of secondary contract benefits in the 106th and the 109th congresses.⁸ (Appendix B provides information on ‘principal locations’ for defense procurements in 1999, 2000 and 2005.)

I apply four measures gauging the geographic structure the defense industry. Foremost, the number of defense facilities in a district serves as a proxy for defense sector employment.⁹ To create this measure, I collected data from a variety of sources--ranging from company and third party websites to corporate 10K and SEC filings-- on the nation-wide locations of major U.S. defense manufacturers Lockheed Martin, The Boeing Company, The Raytheon Company, Northrop Grumman, and General Dynamics and Science Applications International Corporation.¹⁰ I narrowed my search to six top U.S. defense industries to increase manageability. The large number of defense-sector merges

⁸ While hand coding helped narrow the number of potentially relevant districts per location, the method does not entirely obviate the problem of multiple districts spread across city limits. When I could not determine which specific district a primary location falls within, I coded each potentially relevant district for the same project location. This over-cludes more urban areas that fall across multiple districts. However, if anything, this stacks the model against the theory of economic dependence in districts with more homogenous industrial composition. Despite this problem, the measure nonetheless lends important insight on a crucial—and previously underemphasized—stage of the defense contracting process.

⁹ While a direct measure indicating the number or percentage of defense sector employees per district would be optimal, the county-level workforce data available at the Bureau of Labor Statistics website yields predominately “non-disclosable” results on defense sector data.

¹⁰ Primary sources accessed include: The Center for Public Integrity (<http://www.public-integrity.org/pns/list.aspx?act=top>, updated in 2006); Washington Technology (<http://www.washingtontechnology.com/top-100/>, updated in 2003); Source Watch (http://www.sourcewatch.org/index.php?title=Defense_contractors) www.researchcriticalwill.org, www.globalsecurity.org, www.vault.companies.org, <http://www.sec.gov/Archives/edgar/data/12927/0000012927-97-000020.txt>, and electro-optics/alliance/industry/northgrum.htm.

throughout the 1990s streamlining process suggests that this technique should yield relatively accurate results (GAO Report 1997).

These search devices yield 1,014 defense facilities spread across all 50 states. Each industry is cross-checked using Google mapping tools and referenced by city location and zip code. The data are transformed to the Congressional district level using GIS,¹¹ accounting for redistricting plans in each Congress. The variable is coded based on the number of facilities per district.¹² Count variables are also included for headquarters, major facilities (measured on the basis of area per sq mile or facilities with greater than 200 employees)¹³ and subcontracting units. Details on defense facilities appear in Appendix C.

A high concentration of defense facilities in a more sparsely populated area gauges economic dependence on the defense sector. If a thinly populated district encompasses a large number of defense facilities, then a relatively greater proportion of constituents rely on the defense sector to keep the local economy afloat. An interaction term captures the influence of economic reliance in defense procurement allocations (*pop density*facilities*). The measurement corresponds with methodologies utilized in sociological analyses of rural history, which often define the degree of “rurality” or “urban-ness” based on population density or degree of isolation from large, urban places (see Buttel & McMichael 1988, referring to Willets et al. 1982).

¹¹ I thank Jim Gimpel for his assistance utilizing this software.

¹² Reliance on a static measure of a district’s economic structure over a seven-year period is alleviated by the fact that defense employment levels-- a product high investments in industry sites and past Defense Department decisions-- ought to remain relatively stable over short increments of time. (See Arnold 1979, 86, on the relative stability of defense employment).

¹³ Companies self-report ‘major’ facilities in 10K filings based on land area per square mile.

Markuson et al. (1991) analyze geographic effects by focusing on the impact of defense decisions on different regions of the United States. The authors find that the ‘Gunbelt’-- New England, South Atlantic, East and West South Central, Mountain, and Pacific divisions—experienced increases in revenue and gross industrial capacity in the decades following World War II. The losers—East and West North Central—suffered substantial per capita losses (12).¹⁴ The model includes dummy variables to control for possible regional impact, with districts in ‘Gunbelt’ states coded “1” and districts in other states coded “0”.

Political factors operate as intervening variables. The combined effect of economic and geographic factors (*pop density*facilities*) helps explain defense committee membership, while committee member status exerts an independent effect on the distribution of defense contract benefits (which also gradually impact industry and geography).¹⁵ I consulted the Congressional Directory and included a dummy variable coded “1” for defense committee membership in the 106th-109th congresses and “0” to indicate that a member does not belong to a defense committee. Defense committees include the Defense Appropriations Subcommittee, the Armed Services Committee, and the Select Subcommittee on Technical & Tactical Intelligence.

The model includes a variable assessing the impact of congressional party (coded “1” for Republican and “0” for Democrat). A dummy variable for leadership signifies the presence of defense committee and subcommittee chairs. Lastly, a measure for defense sector campaign contributions indicates mutual goals shared among key Congress

¹⁴ In Census Bureau terms, West North Central consists of Iowa, Kansas, Minnesota, Missouri, North Dakota, and South Dakota. East North Central comprises the Rustbelt, or Illinois, Indiana, Michigan, Ohio, and Wisconsin. (All other states are included in the Gunbelt region.)

¹⁵ While politics and economics are presumably mutually reinforcing, lending to a recursive relationship, the theory presented here suggests that the causal event begins with economic conditions.

members and moneyed interests (accessed from www.opensecrets.org, lagged; see Baumgartner & Leech 1998; Hall & Deardorff 2006).

Because the analysis of committee composition employs a dummy variable as the dependent variable (indicating the presence or absence of a defense committee assignment), the OLS assumption of uniform distribution of variance is violated. Therefore, logistic regression maximizes the likelihood of observing a given distribution of the probability of a defense committee assignment based on the economic and geographic characteristics of a district. The number of primary contracts awarded per district and the number of ‘principal location’ assignments allocated per district are count dependent variables. I use poisson regression to assess these measures across each separate Congress. OLS multivariate regression examines the distribution of primary contract dollars.

FINDINGS

Congressional Processes

The logit model in Table 1 displays changes in the predicted probability of observing defense committee membership in the 106th through 109th Congresses based on geographic and industrial factors (controlling for partisanship and excluding headquarter locations).¹⁶ While the optimal test of defense committee composition consists of an interaction term gauging the impact of a large defense sector presence in more sparsely populated districts (*low density*facilities*), multicollinearity problematizes this ideal measure of economic reliance ($r = .99$). Therefore, I include an interaction term gauging

¹⁶ Because headquarters appear in predominantly urban areas (Markuson et al. 1991), inclusion of these districts offset the competing impact of geography in more rural districts with a high concentration of defense facilities.

the impact of facilities in densely populated districts on defense committee membership (*high density*facilities*) ($r=.55$). The theory of disproportionate economic reliance places emphasis on the interactive coefficient (*facilities*), which measures the effect of facilities on the likelihood of observing defense committee membership when population density is set to zero (Brambor et al. 2006).¹⁷

[Insert Table 1 about here]

While previous work on committee composition focused on the presence of industry as a proxy for constituency ‘need’ (Adler & Lapinski 1997), the results suggest that geographic composition also leads to excessive reliance on the defense sector. The findings are consistent with the traditional constituency demand hypothesis, but also demonstrate support for disproportionate constituency dependence in more rural districts.

Consistent with Adler & Lapinski’s demand-side theory of constituency ‘need’, the composition of the defense sector exerts a considerable effect on defense committee membership. At its maximum level of impact, the large presence of the defense sector in a densely populated, urban area (*facilities*high density*) yields a range of 19% (106th congress) to 24% (108th congress) greater probability of observing a defense committee assignment than one would observe in other districts ($p<.05$, excluding the 107th Congress). Consistently, the presence of a major facility in a district increases the likelihood of a defense committee assignment by 13% ($p<.05$, one-tailed test) to 34% ($p<.05$).

¹⁷ Given the frequent misuse of interaction terms (see Brambor et al. 2006), a word of caution concerning their interpretation is warranted. Unlike standard additive models, interactive models examine conditional relationships among the interactive coefficients. Rather than operative as controls (set to a variable’s respective mean value), interactive coefficients display the impact of the variable when the other interactive coefficients are set to zero.

However, the results also support the distinct conceptualization of district ‘need’ based on the homogeneity of industrial composition: rural geography shapes Congress members’ calculations in seeking defense committee assignments. Congress members from the most sparsely populated, rural districts with a high defense sector presence (*Facilities*) demonstrate a 77% to 89% greater likelihood of joining defense committees than other members, throughout the 106th – 109th Congresses ($p < .001$), all else being equal. Districts with a greater proportion of constituents employed by the defense sector enjoy greater levels of Congressional involvement on defense and national security policies.

These findings provide preliminary evidence of two distinct Congressional motivations: First, the technological *capacity* of a district draws increased revenue and invites congressional credit-claiming opportunities. Second, the economic *need* of a constituency places a premium on large facilities that keep the economy afloat. The former primarily occurs among more urban, industrially vibrant and high-income locations; the latter takes place in more rural setting, where the closing of a large defense facility could spiral massive lay-offs and potentially wreck the economy.

Primary Defense Procurement Allocations

Two additional models provide a direct test of whether disproportionate economic reliance affects primary procurement outcomes. The theory that economic reliance motivates policy outcomes can be expressed with the interaction term combining geographic composition and a large defense sector presence (*high density*facilities*). Multivariate regression analysis tests the impact of economic, geographic, and political factors on the dollar amount awarded for primary defense procurements in a district.

[Insert Table 2 about here]

The findings in Table 2 largely agree with previous research: the Defense Department awards the bulk of primary defense contract dollars to corporate headquarter locations ($b = .49$ to $.60$ $p < .001$) (also see Mayer 1991; Markuson 1991; Rundquist & Carsey 2002). While political factors reveal inconsistencies across years, evidence suggests that defense committee members began to play a more prominent role in defense contracting in the 108th and 109th Congresses. These years are particularly relevant because they immediately follow U.S. entrance into the Iraq war, which spurred an increased demand for weapons system. Indeed, in the 108th and 109th Congresses, defense committee membership associates with an increase in defense dollars ($b = .11$; $.08$ $p < .05$, one-tailed test). At the same time, defense committee leaders begin to successfully direct benefits to their constituencies ($b = .12$, $p < .01$; 109th Congress). As the theory of disproportionate economic reliance expects, as defense committee members began to influence prime contract allocations, defense dollars also associated with a large concentration of defense facilities in the most sparsely populated districts ($b = .18$; $p < .01$; 109th Congress).

Assessing the number of primary procurements awarded per district—as opposed to the money funneling into these districts—beings to highlight the consistent influence of multiple political factors. Poisson regression tests the impact of industrial and political factors on the number of prime contracts awarded to a district. Table 3 displays incidence rate ratios (IRR's), which compare the rates of observing a defense contract assignment on a standardized scale, summarizing the size of the rate for each variable relative to the

other variables.¹⁸ The findings demonstrate political effects in the distribution of primary contract assignments, after controlling for district capacity to accept defense projects.¹⁹

[Insert Table 3 about here]

Not surprisingly, headquarters continue to explain a large amount of variance in prime procurement allocations, ranging from a staggering 505% to 395% increase in the rate of observing a primary contract project ($p < .001$; in the 107th and 109th Congresses, respectively). However, despite the magnitude of this influence, members of defense committees nonetheless draw prime contract projects to their districts at an increased rate of 23% to 84% ($p < .001$). Defense committee leaders experienced a sharp increase in district benefits in the 108th Congress, furnishing their constituencies with defense projects at a 249% greater rate than other districts ($p < .001$). The disproportionate influence among defense committee leaders drops to a 32% increase over other districts in the 109th Congress, perhaps as a result of increased public criticism over inefficiency, fraud, and waste in the Iraq war.

As the theory of disproportionate economic reliance predicts, a highly concentrated defense sector presence in rural districts corresponds with defense committee influence. As the interactive coefficient (*facilities*) exhibits, economically reliant districts generate a 2% to 8% greater rate of defense projects than other districts, all else being equal ($p < .001$; excluding the 106th Congress). While the magnitude of the impact is relatively minor, the influence of rural geography is further augmented by the finding that a high concentration of defense facilities in urban areas does not impact

¹⁸ I calculated the incident rate ratios by taking the logged exponential of the coefficients. I only report the incident rate ratios for ease of interpretation.

¹⁹ The model controls for defense headquarters and subcontracting facilities. I drop major facilities from the model in order to mitigate multicollinearity.

prime contract allocations at statistically meaningful levels. As defense committees generally draw members from more economically reliant districts (see Table 1), it is also reasonable to assume that the influence of key committee members captures much of the same variance as a defense sector presence in rural districts (thus reducing IRR's associated with defense industries in reliant areas).

The distribution of the prime defense contracts also magnifies the skewed regional development of the defense sector. 'Gunbelt' regions receive a 13% to a 78% increased rate of defense contract assignments over other regions, controlling for defense manufacturing capacity ($p < .001$). This considerable geographic bias further magnifies the Pentagon's influence in determining regional 'winners' and 'losers' in U.S. industry.

The positive association between defense sector campaign contributions and the distribution of prime contracts further highlights mutually entangled interests shared among defense industry management, high-level defense bureaucrats, and key Congress members. However, the marginal degree of influence undercuts the notion that lobbyists are 'buying' access to the political process (.002% to 2%, $p < .001$; also see Hall & Deardorff 2006).

Somewhat surprisingly, Republican districts exhibit a 12% to 7% reduced rate of defense contract projects ($p < .05$). In a Republican majority Congress, it is worth speculating that committee leaders may strategically cut deals with ambivalent or opposing Democrats, and funnel pork projects into their districts in order to build coalitions necessary to pass budget proposals (see Evans 1994).

Why are the number of prime contracts awarded to a district rife with political influence, while prime defense dollars are largely driven by district capacity?

Congressional logic helps explain the considerable disparity between the distribution of defense dollars and projects. Defense projects attract a greater level of publicity and visibility than monetary distributions. Most constituents do not pay a great deal of attention to matters as arcane as the price of the MX missile system. Therefore, it seems as though primary defense projects distribute more broadly than revenue, while the bulk of the money funding these projects remains more highly concentrated.

Disseminated Contract Benefits

The theory of disproportionate economic need suggests that a large defense sector presence in more rural districts will associate with a greater number of principal assignments than more urban (and less reliant) districts. This further assumes that defense committee members—especially those representing the most reliant districts-- will attempt to direct these processes.

[Table 4 about here]

As revealed in the results of Table 4, members of defense committees appear to have stunning success in directing secondary benefits to their constituencies. Districts with defense committee representation enjoy a 209% and 219% increased rate of principal assignments over other districts in the 106th and 109th Congresses, all else being equal ($p < .001$). In the 109th Congress, defense committee chairmen directed defense benefits back to their constituencies at a 49% greater rate than other districts ($p < .001$), further emphasizing increased political involvement in defense contracting during wartime.

Further, more rural constituencies with a large defense industry presence receive principal assignments at substantially greater rates than their more urban counterparts

with a large defense sector. Disproportionately reliant, rural districts received principal assignments at an increased rate of 29% and 27% over other districts in the 106th and 109th Congresses, respectively ($p < .001$). While the most densely populated districts with no defense facilities generate a 21% reduced rate of principal assignments ($p < .001$), even densely populated districts *with* a high concentration of defense facilities associate with a 2% reduced rate of principal operations ($p < .001$).

The dissemination of principal assignments to subcontracting facilities (IRR= 28%, 10%, $p < .05$, one-tailed test) affirms the role of industrial capacity at this contracting stage. However, both political need and economic reliance influence subcontracting arrangements at greater magnitudes than industrial capacity alone. The results show that a district's economic need for defense dollars is an important factor in the allocation of defense benefits.

DISCUSSION

The study demonstrates the importance of taking into account a district's dependence on defense spending. A large defense sector presence in more rural districts influences: 1) whether Congress members will join defense-related committees, 2) the distribution of prime defense contracts, and 3) the dissemination of secondary district-benefits flowing from the primary contract arrangement.

Previous academic work on the distributive politics of defense spending has failed to uncover political effects for two reasons: First, scholars have not taken into account the effect of a district's economic reliance on the type of government expenditure. Second, research has focused only on the allocations of primary defense contracts, which are

merely precursors to the principal dissemination stages. By probing more deeply into the defense contracting process, this study uncovers evidence that the degree to which defense procurement policies receive priority among individual House members varies considerably, largely as a function of the industrial and geographic composition of a district.

Key Congress members, high-level defense bureaucrats, and defense sector management comprise an iron triangle that guides U.S. defense policies. Various stages of defense contracting emphasize the role of this iron-clad network. However, the function of the defense industry within this subsystem is especially critical considering that defense contractors do not typically bid for procurements in an open, competitive process. Instead, contractors rely on privately coordinated negotiations with top defense bureaucrats and defense industry management (Arnold 1979, 6-7). If the Lockheed Martin corporate headquarters in Bethesda, Maryland receives a multi-million dollar defense contract award, then the relevant directors employ vast discretion in assigning various parts of the project to either a Lockheed Martin facility, or subcontracting out to another company. The results of this analysis highlight a symbiotic relationship among key players, where spreading ancillary defense benefits across multiple districts increases political demand for weapons systems among Congress members and sustains rural economies marked by a relatively homogenous defense industry presence. However, extending defense contracting also exacerbates local dependencies and leads to unnecessary weapons spending at the expense of strategic national defense.

Economic and geographic structures encourage Congress members and industry to work together in pursuit of independent but mutually overlapping goals. These

interests lead to the proliferation of defense production beyond strategic requirements. Defense subcontracting thus extends indefinitely in order to meet political demands for district benefits, while reinforcing the economic need to manufacture weapons systems (see Melman 1974). Given the security and economic consequences that follow, I believe that this is an important result.

Table 1: Impact of Economic and Geographic Factors on Congressional Defense Committee Membership in the 106th – 109th Congresses

Predicted Probabilities

Independent Variables	106th Congress	107th congress	108th Congress	109th Congress
Party (Republican)	0.009	-0.0004	-0.06	-0.008
High Density	-0.18	-0.19	-0.23	-0.18
Gunbelt	0.02	0.07*	-0.02	-0.02
Major Facility	0.24*†	0.30*	0.13*†	0.34*
Subcontractor	-0.07	0.12	0.42*†	0.34
Facilities	0.89***	0.77***	0.85***	0.87***
Facilities X High density	0.19*	0.15	0.24*	0.23*
	N = 412	N=411	N=411	N= 411
	McFadden's R2= .15	McFadden's R2= .13	McFadden's R2= .15	McFadden's R2 = .17
	Count R2 = .83	Count R2= .82	Count R2= .80	Count R2 = .82
	Prob>Chi2=0.00	Prob>Chi2=0.00	Prob>Chi2=0.00	Prob>Chi2= 0.00

Note: Table 1 displays logit coefficients. All entries are changes in predicted probabilities from the minimum to maximum likelihood value. The dependent variable indicates a defense committee assignment (coded "1" for defense committee and "0" for non-defense committee assignment).

***p<.001; **p<.01; *p<.05 (two-tailed test)

† (one-tailed test)

Table 2: Impact of Industrial and Political Factors on Primary Defense Procurement Dollars per District in the 106th – 109th Congresses

Independent Variables	Standardized Coefficients			
	106th Congress	107th congress	108th Congress	109th Congress
Party (Republican)	.01	-.008	.02	-.01
High density	.008	.02	.04	.03
Gunbelt state	.03	.03	.05	.03
Defense contribution	.07	.12*	.06	.005
Defense Cmte	.04	-.02	.11*	.08*†
Defense Cmte Leadership	.004	-.01	.04	.12**
Headquarters	.60***	.52***	.41***	.49***
Subcontractors	.10*†	.07*†	-.04	-.04
Facilities	-.04	.02	.07	.18**
High density* Facilities	-.02	-.11	-.15	-.16
	N=435 R2= .37 AdjR2= .36 Prob>F=0.00	N=435 R2= .29 AdjR2= .27 Prob>F=0.00	N=435 R2= .19 AdjR2= .17 Prob>F=0.00	N=435 R2= .30 AdjR2= .28 Prob>F=0.00

Note: All entries are standardized OLS coefficients. The dependent variable indicates prime defense contract dollars received per district. The data were extracted from the Federal Procurement Data System and transformed to the district level for the years 2000-2005.

***p<.001; **p<.01; *p<.05 (two-tailed test), † (one-tailed test)

Table 3: Impact of Industrial and Political Factors on the Number of Primary Defense Procurements Awarded per District in the 106th – 109th Congresses

Independent Variables	Incidence Rate Ratios			
	106th Congress	107th Congress	108th Congress	109th Congress
Party (Republican)	0.87***	0.81***	0.78***	0.93*
High density	1.008	1.0009	1.007	1.007
Gunbelt state	1.21***	1.34***	1.78***	1.13***
Defense contribution	1.0002***	1.0001***	1.02***	1.02***
Defense Cmte	1.84***	1.52***	1.23***	1.53***
Defense Cmte Leadership	0.58	0.32	3.49***	1.32***
Headquarters	6.04***	6.05***	6.04***	4.95***
Subcontractors	1.82***	2.07***	0.84	0.85
Facilities	1.004	1.02***	1.08***	1.07***
High density* Facilities	0.99	0.98	0.97	0.97
	N=434 PseudoR2= .43 LR chi2(10)= 6908.61 Prob>F=0.00	N=435 PseudoR2= .44 LR chi2(10)= 14427.05 Prob>F=0.00	N=435 PseudoR2= .37 LR chi2(10) =14390.50 Prob>F=0.00	N=434 PseudoR2= .30 Lrchi2(120)= 7864.72 Prob>F=0.00

Note: Entries are incidence rate ratios. The dependent variable indicates number of prime defense contracts received per district. The data were extracted from the Federal Procurement Data System and transformed to the district level for the years 2000-2005. .
***p<.001; **p<.01; *p<.05 (two-tailed test); † (one-tailed test)

Table 4: Impact of Geography, Industry and Congressional Committee Status on Principal Procurement Locations in the 106th & 109th Congress

Incidence Rate Ratios

Independent Variables	106 th Congress	109 th Congress
Party (Republican)	1.21***	1.06
High density	0.79***	0.79**
Gunbelt state	1.49***	1.68***
Defense contribution	1.01***	0.99
Defense Cmte	3.09***	3.19***
Defense Cmte Leadership	0.84	1.49***
Headquarters	1.04	0.99
Subcontractors	1.28***	1.10*†
Facilities	1.29***	1.27***
High density* Facilities	0.98***	0.98***
	N=435 PseudoR2= .47 LR Chi2(10)= 2102.52 Prob>F=0.00	N=435 PseudoR2= .42 LRchi2(10)=1753.19 Prob>F=0.00

Note: All entries are incidence rate ratios. The dependent variable indicates the principal location in which defense procurement projects are built. The data were extracted from the Federal Procurement Data System and transformed to the district level for the years 1999, 2000 and 2005.

***p<.001; **p<.01; *p<.05 (two-tailed test); † (one-tailed test)

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