"The Great Arsenal of Democracy": The Political Economy of the County-Level Allocation of World War Two Military Spending

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During the Second World War, the federal government assumed an unprecedented degree of control over the US economy. At the peak, the share of federal government expenditures in GNP soared to 44 percent, a level never attained before or since. In addition to enrolling 16.4 million Americans (that is, about one-eighth of the 1940 population) in the armed forces, the federal government spent $196 billion between June 1940 and June 1945 on military supply contracts and $31 billion on investments in new factories and military installations. In today's purchasing power, this total would come to roughly two trillion dollars. Although this war effort represented the largest single intervention by the federal government in the economy, the political economy of these enormous spending flows has been subject to relatively little systematic scholarly investigation.[1]

This paper uses county-level economic and political data to investigate the determinants of the geographic allocation of World War II-era military spending, both for major war supply contracts and for new facility projects. It builds on two extensive literatures. The first, with important contributions by Reading (1973), Wright (1974), Wallis (1987, 1998. 2001), Anderson and Tollison (1991), Fleck (1999, 2001), Fishback et al. (2001) and others, investigates the political economy of the New Deal spending. The second is more contemporary, analyzing the geographic allocation of federal resources in the recent period (see Levitt and Snyder, 1995 and 1997 for an overview).[2] Work that examines the contemporary sub-state distributions of funds generally focus on Congressional control or seniority. We extend this literature by evaluating the relative importance of a wider variety of political and non-political motives. As a caveat, World War Two was a period of great national crisis and our findings regarding the allocation of

[1] See Rhode (2000) and Bateman and Taylor (2001a and 2001b) for analysis of state-level World War Two spending data.

[2] Within this vast literature, Goss(1972), Mayer (1991), Ray (1981), Rundquist (1978), and Rundquist and Griffith (1976) focus specifically on the role of congressional power on the distribution of military contracts. As a quick summary, few of the studies find congressional committee assignments or seniority matter much.

funds may not readily generalize to periods of "normalcy." Nonetheless, the wartime experience is of considerable interest in its own right.

Our analysis focuses on two important sets of questions: (1) What was the relative importance of strategic, economic, and political forces in the spending decision process?[3] (2) What were key determinants of spending within the political allocation process? For example, what was the relative importance of presidential versus congressional influence? Utilizing detailed data on the 3000 plus counties (as opposed to the 48 states) offers us much greater opportunity to disentangle these relationships. The larger sample size liberates us from the degrees of freedom problems that constrained some of the studies of the New Deal era (e.g. Anderson and Tollison (1991)) from including a full set of political and economic variables.

Focusing on sub-state allocations provides tests that are not possible with state-level data. For example, many standard political allocation models suggest that funds should be disproportionately go to very large or very small states because of the Electoral College system while within each state, funds should be spread more evenly across large and small communities. Another benefit of using county-level spending is the ability to test for the importance of House committee assignments, leadership posts, and other member-specific and district-specific characteristics. Except in the big cities, county lines generally coincide with congressional district lines in the 1940s. The county units were geographically stable, making it is straightforward to calculate the degree of inter-temporal stability or instability of each county's voting patterns (as in Wallis). County lines are almost surely exogenous (unlike, say, congressional districts), so there is no danger of grouping on an endogenous variable.[4] Looking at the finer aggregate level also allows us to consider issues such as spillover effects of spending.

[3] Using the state-level data, Rhode (2000) and Bateman and Taylor (2001b) both found that economic factors (chiefly, pre-war industrial capacity) rather than political factors (presidential voting behavior and congressional power) mattered most for the distribution of military purchases during World War Two. But Rhode also found political factors, especially party loyalty, did help explain where new investments in military and industrial facilities were located. These relationships may be clouded by state-level aggregation and using county-level data should produce more robust findings.

[4] Disadvantages of using the county-level data include that fact that some counties are split between more than one congressional district; some of the manufacturing and election data are poorer quality at the county than state levels, and that there likely are meaningful economic and political spillovers across county lines.

This paper has the following form: the first section documents the unprecedented level of the federal government spending during World War Two and maps its highly uneven geographic distribution. The next section briefly traces the evolution of the government procurement policies and agencies over the war, highlighting accounts of the role of lobbying in shaping the allocation decisions. The third section extends the state-level political-economy model that is standard in the New Deal literature to encompass (a) the allocation of spending across jurisdictions within an election area; and (b) the joint role of Presidential and congressional candidates in determining spending outcomes. The fourth section discusses the implementation of this model and develops a baseline framework to incorporate strategic and economic determinants of spending. The fifth section presents our main empirical results and provides a series of "experiments" to interpret the magnitude of the estimated effects. The final section concludes, offering suggestions for future avenues of research.

I

Building Roosevelt's "Great Arsenal for Democracy" required great effort from the American people. During the war, US industry produced 296 thousand aircraft, 76 thousand ships, 86 thousand tanks, 477 thousand bazookas, 20 million small arms (including rifles, machine guns, and hand guns), 27 million gas masks, 23 million ampules of sodium penicillin, 52 million pairs of boots and shoes, 271 million drawers, and much, much more.[5] In current dollars, spending on military supply contracts, facilities, and project orders totaled $237.1 billion over the June 1940 to June 1945 period.[6] In today's (2000) dollars, this is equivalent to roughly $2,023 billion. Relative to the 1940 total population, per capita spending over this five-year period averaged $1,813 in current dollars or almost $15,500 in 2000 purchasing power. In real annual per capita terms, domestic procurement spending during World War Two was four-and-one-half times higher than the New Deal era spending which has attracted so much scholarly

[5] War Production Board (1945) pp. 106-10.

[6] Project orders are "orders for work issued to Government-owned arsenals, shipyards, manufacturing depots, and the like." US Senate, Committee on National Defense Migration, *Washington Hearings*, p. 6582.

attention.[7] Focusing strictly in fiscal terms (and ignoring its ability to make life-and-death decisions affecting the millions of service personnel), the federal government exercised unprecedented control over the US economy during the war. At the peak in 1944, the share of federal government expenditures in GNP reached 44 percent, many times the 4 to 7 percent share prevailing over the 1933-39 period.[8] Defense spending accounted for over four-fifths of the federal government outlays.

Table 1 presents data on the cumulative distribution of military procurement spending by category over time. Contract spending accounted for slightly over $196 billion, 86 percent of the total; facility projects (such as new or expanded military installations or munitions factories) received almost $32 billion. Of the contract spending, about 30 percent was for aircraft, 25 percent for ordnance, 15 percent for shipbuilding, and 5 percent for communication equipment. Of the facility investments, 57 percent was devoted to industrial projects, the remainder for military projects. These public funds accounted for roughly two-thirds of all investment in manufacturing plant and equipment during the war period. Some 1,595 new industrial plants were built using federal money as part of the war effort. Another important point drawn from Table 1 is that about one-half of total spending and about three-quarters of facility investments were allocated by the end of 1942, suggesting that many of the key decisions were made relatively early in the conflict.

The WWII spending displayed a high degree of geographic variability. Table 2 provides information on the distribution of military spending (for contracts and facilities only) in the top twenty counties measured in total and per capita terms.[9] The list for total

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[7] The total New Deal per capita spending between 1933 and 1939 was $363 according to the aggregated data for "expenditures, loans, and insurance" in Reading (1973) Table 1 divided by the 1930 total population. To adjust for inflation, we use changes in the GNP deflator between 1936 and 1943.

[8] See Table 1 of the GDP accounts at http://www.bea.doc.gov/bea/dn/st-tabs.htm.

[9] These figures apparently exclude expenditures for the Manhattan Project, which over the 1942-45 period cost $1,890 million dollars. (Hewlett and Anderson (1962) pp. 723-24.) Although the Los Alamos laboratory is the leading symbol of the atomic bomb program in the public mind, it absorbed relatively little of the money. Of the total expenditures, $1,188 million was allocated to projects/facilities at Oak Ridge (Anderson Co.) TN, $390 million to Hanford (Benton Co.) WA, $74 million to Los Alamos (Sandoval Co.) NM, and $27 million to heavy water plants (located in Trail, BC; Morgantown, WV; Montgomery, AL; and Dana, IN.) The total for the "two billion dollar gamble" was less than 1 percent of the expenditures analyzed in the paper. It appears unlikely that including the Manhattan Project spending would fundamentally change our results.

From the available literature, the location criteria for the Manhattan project included finding remote, secure sites with good access to water and transportation. Oak Ridge and Hanford required access

spending includes the "usual suspects," chiefly large industrial counties. Wayne County, MI (home of the Detroit automakers) is number one with 5.7 percent of total spending; Los Angeles, CA number two (with 4.9 percent); and Cook County, IL is number three (with 4.4 percent). Collectively the top twenty counties account for 39.3 percent of total spending. The top twenty list for per capita spending contains more surprises. Sarpy County, NB was number one with spending of $60,800 per 1940 resident, over 30 times the national average. This county, located just south of Omaha, had been home to the Army's Offutt Air Field since the early 1920s and in 1940 became the site of Glenn Martin's bomber assembly plant.[10] In reviewing these data, it is worth emphasizing that almost 42 percent of the counties in our dataset (1285 out of the total 3072) received no major supply contracts or facility investments.

To appreciate the enormous geographic variation of spending, it is helpful to examine Figures 1 through 4.[11] (The four figures map, respectively, total spending, contract spending, facilities investment, and per capita spending at a county level.) The maps reveal that spending levels varied greatly across the nation, and even within virtually every state. Taking Nevada as an example, the figures show the southwestern counties received high levels of per capita spending whereas the northeastern counties

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to cheap electric power, and the New Deal dam-building programs in the Tennessee valley and the Pacific Northwest undoubtedly had an impact on the locational choices. A further requirement for the Hanford and Los Alamos sites were that no major population centers could be directly down-wind. As an aside, Los Alamos was chosen from among the New Mexico sites in part because Robert Oppenheimer wished to give his atomic scientists "a laboratory with a view." Rhodes (1986) p. 450. The original Jemez Springs site was situated in a deep canyon which was judged "too confining."

The secrecy surrounding the project and its perceived importance in the war effort shielded the project from much congressional oversight. The House and Senate leadership and relevant committee chairs on both sides of the isle was kept informed about the "general state of the project" and of how the expenditures were hidden in the Appropriations bill. Despite its two-billion price tag and the need to build three government towns from scratch, most "members of Congress remained completely in the dark." The Oak Ridge facility received its first oversight tour by "very small number of carefully selected legislators" in May 1945; the first congressional delegation to Hanford took place after V-J day. It is commonly asserted that President Truman first learned in detail about the atomic bomb in a 24 April 1945 letter from Secretary of War Henry Stimson. But it is clear that he was aware of the existence of the Manhattan project from his Senate defense investigating committee. Groves (1962) pp. 359-66.

[10] The plant built B-26 Marauders and B-29 Superfortresses including both the "Enola Gay" and "Bock's Car" aircraft which the atomic bombs on Japan. See http://www.offutt.af.mil/geninfo/history/.

[11] In some sense, procurement activity was widely distributed. There was at least one procurement office in every state and as far as our data permit us to determine every congressional district received some spending. To be more precise, every congressional district contained at least one county that received funding. Our county-level data do not permit use to investigate the allocation of money in counties split between districts. The wide distribution of activity undoubtedly reflects both politics and the vast scale and scope of the war effort.

received nothing. This diversity highlights the value of analyzing spending at the sub-state level. Nationally, several patterns stand out. Coastal areas generally received higher level of spending. Activity is also concentrated in the core industrial areas (including the Northeastern manufacturing belt, the Piedmont region in the south, and the Pacific Coast cities.) Lastly, there is a wide belt of counties in the Great Plains and northern Rockies without significant spending. It is notable that many of these states were among the high per capita spending areas during the New Deal. Six of the top ten states (North Dakota, South Dakota, Montana, Idaho, New Mexico, and Wyoming) during the New Deal period were in the bottom ten during the World War Two period.[12]

One of the notable differences between the war effort and most federal programs before or since is that the World War Two money was all-new and untied to state matching formulas. This simplifies the analysis because we do not have to focus on the strengths of pre-existing interest groups or on the decisions by state governments. Understanding how the vast new source of funds was allocated requires we turn our attention to the nation's capital and investigate the evolution of procurement policy in greater detail.

II

In the two decades before 1939, the US government spent only one to two percent of national income on its military. Most of what little was spent for supplies and arms was allocated according to rigidly specified competitive procedures. Procurement officers in the Army or Navy would advertise for clearly defined quantities and qualities for a specific item, invited bids, and awarded the contract to the lowest qualified bidder. Long-term contracts and development/educational funds were rare. Even when a firm did receive R&D funding to create a design, the contract might be let to rival producer. In addition to using short-term, arms-length, competitive contracting, the federal

[12] Including expenditures for the Manhattan project would raise New Mexico's ranking, but apparently the state would still be in the bottom ten in per capita terms. Indeed, at the state-level, per capita spending over the two periods is negatively correlated—the correlation coefficient is –0.12 in the entire sample and –0.31 if Nevada is excluded. This observation suggests applying a unified political economy explanation to spending patterns in both periods will prove challenging.

government also imposed profit limits on aircraft and shipbuilding contracts under the 1934 Vinson-Trammel and 1936 Merchant Marine Acts.[13] The desirably of military contracting was further reduced by bad experiences with contract cancellations following World War One and by public hostility towards the "merchants of death" as reflected in the 1934-36 investigations of the munitions industry by the Senate's Nye committee.

The chaotic World War One experience was not happy for the military either. In 1922, the Joint Army and Navy Munitions Board (ANMB) was formed to improve coordination of military procurement during periods of national emergency. In 1931 and roughly every two-three years thereafter, the ANMB issued an Industrial Mobilization Plan. The planners surveyed 25-30 thousand manufacturing plants, taking special notice of their machine tool capabilities and transportation situation, and devised their wartime munitions orders accordingly. The planners also assigned each plant to the Service branch it was to supply. When the third revision of the plan was completed in the spring/summer of 1939, over 10,000 plants were "given sealed orders to be opened in the event of war." Kester, (1940) p. 684.

The actual outbreak of full-scale war in September 1939 led to dramatic changes in "business as usual." Table 3 offers a condensed timeline of the evolution of government agencies in charge of procurement and industrial mobilization over the 1939-45 period. One key set of changes was the expediting acts of June 28 and July 2, 1940, which allowed negotiated, cost-plus-a-fixed-fee contracts and payment before delivery. While procurement authorities continued to use competitive bidding for small contracts, the vast majority of procurement contracts shifted to a negotiated basis.[14] In October 1940, the federal government also eliminated profit ceilings on defense contracts, using excess-profit taxes in their place.

Among the other important changes was establishment of a series of civilian-run bureaucracies to facilitate the war production effort. In May 1940, Roosevelt used powers dating back to the First World War to establish Advisory Commission of the Council for National Defense, which became known as the NDAC. Over the course of

[13]See Smith (1959); Craven and Cate (1955) esp. Ch 8 and 9; Holley (1964); and Fairchild and Grossman (1959), esp. Ch. VI.

[14] Higgs (1993) notes that, between July 1, 1939 and June 30, 1940, 87 percent of the War Department procurement occurred through the advertising/invitation-to-bid procedure whereas between July 1, 1940 and February 28, 1941, 74 percent of purchasing was under negotiated contracts.

the war, the NDAC begat the Office of Production Management (OPM) which begat the War Production Board (WPB) which begat the Civilian Production Administration (CPA). As was typical in the Roosevelt administration, an additional layer of bureaucracy, first the Supply Priorities and Allocations Board (SPAB) and later the Office of War Mobilization (OWM), was imposed on top of these agencies. Although the agency names changed, the leading actors did not. These included William S. Knudson, a dollar-a-year man on leave from General Motors, Donald M. Nelson, another dollar-a-year man who had been an executive at Sears-Roebuck, and Sidney Hillman, a former union chief. Other principals were Henry Stimson and Frank Knox, two promenient Republicans that Roosevelt had appointed Secretaries of War and Navy, respectively, in the summer of 1940.

Most histories of the agencies and officials involved in procurement note that the spending process, especially plant location decisions, induced intense lobbying by politicians and business and community leaders. For example, Nelson, who headed the OPM plant location efforts in 1941, observed: “We were operating in a democracy which was still at peace and subject to the pressures of politics. Platoons of Senators and Representatives stimulated by their constituents, descended upon us. Hundreds of briefs were submitted by towns all over the United States, and, since we were thinking about defense only, I suppose that our selection of sites pleased nobody." Nelson (1946) pp. 149-51.[15]

The OPM’s official history also notes that during that year the Office “was deluged with requests from Congressman and Senators from various parts of the country suggesting the location of defense plants in their respective Districts and States.” The publication makes special mention of the efforts of Senator Arthur Capper, Republican of

[15] According to Nelson's postwar account, the OPM’s Plant Site Committee, which reviewed and approved proposals for new defense plants and facilities, was "instructed to decentralize defense industries, in the interest of employment and raw materials... Naturally, every section of the country wanted plants, but the tendency of the Army and Navy was to place them in areas where the various materials and products had been created before." Nelson, recognizing that this policy was expedient in the short-run, questioned its longer-run effects. "We felt that a very serious manpower shortage might develop... and we thought it important to select locations for new manufacturing facilities in areas where the nation's resources in manpower, transportation and raw materials could be used to best advantage. For instance, there were some sections of the country, notably in the South and Middle West, where large pools of unemployed men existed because there was no sufficient industry to absorb the available labor supply." See also US Civilian Production Administration (1945) pp. 41-42, 56-62.

Kansas, to lobby for more mid-western plants.[16] Irving Holley's *Buying Aircraft* echoes this account. The Army Air Corps procurement officials "responsible for site selection were subjected to a good deal of pressure from various localities in the interior urging their advantages and the need for an equitable distribution of defense orders." In particular, Holley (pp. 307-08) cites letters from Sen. Josh Lee, Democrat of Oklahoma (10 Dec 1940) and Sen. Sheppard, Democrat of Texas (12 Dec 1940) seeking aircraft plants for their states.

Frederic C. Lane's *Ships for Victory* tells much the same story regarding the U.S. Maritime Commission's shipbuilding program. The location of new sites was "a question full of political dynamite. Each region was optimistically conscious of its possibilities and would feel slighted if not given what it considered its share. Within each region many more sites were advocated than could be used. Later, a flood of letters came from Senators, Representatives and other political leaders, urging consideration of proposals from their constituents. But the initial selection, which laid down the lines followed in future growth, was made when the political pressure was less than it became after the program was announced and its potentialities were appreciated." p. 47

In a chapter entitled "Politics and Administrative Methods in the Selection of Shipyards Sites," Lane observes "The whole process of selecting and rejecting was done under heavy political pressure, which was most evident in some cases of rejection…As it became clear that new shipyards were to be financed by the government a torrent of letter poured in to the Commission offering sites. (p. 150)" "(L)abor leaders as well as senators, governors, mayors, and Congressmen voiced local desires to have the government spend money for a shipyard in their neighborhood.(p. 151.)" "Having to reject so many applications, the Commission was exposed to the charge of playing favorites. Individuals who were sent away empty handed felt they or their communities were being discriminated against. There was talk about not having the right 'contacts.' (p. 152)."

[16] In addition to Capper's letter of 29 April 1942, US Civilian Production Administration (1945) p. 57 cites specific letters from representatives from Wisconsin, Arkansas, Louisiana, Montana, Kansas, Indiana, and Connecticut: A. Wiley, 1-29-41; T. Wasielewiki, 1-9-41; C. Ellis, 2-1-41; J. Sanders, 1-15-41; B. Wheeler, 11-26-41; W, Burke, 5-9-41; J. Boehne, 12-23-41; W. Fitzgerald, 3-21-41

The placement authorities responded to these complaints by creating Plant or Site Location boards. This counter-move of addressing the problem by adding more bureaucracy is clear in the case of the Maritime Commission. Criticism of its site selection process received a full airing in the hearings of the Truman Committee on 3 June and 9 July 9 1941. (Lane pp. 152-54.) Within a few weeks, the Commission established Shipyard Site Planning Committee to "determine the suitability of projects from the standpoint of geographical position, availability of labor, power, and transportation, and the financial and technical experience of the applicants." The OPM responded to the political heat generated in plant location process even earlier than the Maritime Commission. In early 1941 "a movement arose in Congress to establish by legislative action a Plant Site Board to pass upon the location of plant sites for Government defense facilities in order to bring about a greater decentralization of industry (US Civilian Production Administration (1945) p. 40)." Noting the "disadvantages of Congress rigidly fixing standards," William Knudsen suggested the OPM take preemptive action. On 17 March, the Office established a Plant Site Committee "to review and approve or disapprove proposed locations for additional plant or facilities required for the national defense." The Committee, which was converted into a more permanent Board (or PSB) on 6 May 1941, was to work in close cooperation with representatives of Ordnance Department, the Army Air Corps, and the Navy Department (pp. 40-42).[17]

"Such factors as availability of labor, transportation facilities, housing, waterpower, community services and attitude, sources of raw materials and destination of the finished products, and the general relation of the new plants to the over-all distribution of manufacturing facilities in the country were carefully examined. The board was anxious to avoid, if possible, the building of plants in already highly industrialized and congested areas." (p. 56) "The Plant Site Board did endeavor to locate new facilities away from highly industrialized areas. In part the location of new facilities was determined by strategic reasons... According to Nelson, supply contracts followed

[17] The PSB continued to operate under the War Production Board. US Civilian Production Administration (1945) p. 107. It was superseded on Oct. 17, 1942 by the Facilities Clearance Board and Facility Review Committee, which continued through May 24 1943. Nelson's policy was to restrict new construction to facilities that would be on-line before mid-1943.

the location of industry; but new facilities were planned to follow at least partial decentralization." (p. 58.)[18]

PSB policy called for preserving "the area north of the Mason-Dixon line and east of the Mississippi River for defense manufacturing requiring highly skilled labor, such as aircraft engines, and indicating that approval for other types of facilities in this area would, in general, be given only in exceptional circumstances." The Board (pp. 60-61) "was aware on the undesirability of further concentrating aircraft facilities in southern California, of expanding plant facilities in the Detroit area, of enlarging shipbuilding plants around Camden, New Jersey, and of locating more plants at Bendix, Philadelphia, Rochester, and other highly industrialized centers." It acted primarily as a "negative planning unit" which frequently initially vetoed proposed sites and urged the procurement officials look in less congested areas. "In view of the urgency for speeding up production, however, the Plant Site Board was reluctant to exercise this (veto) power for fear of impeding the defense effort."(pp. 59-61)

It appears expediency was the order of the day. The PSB and other civilian authorities generally allowed the military procurement officers to contract where they pleased, and in turn, the procurement authorities allowed their manufacturing suppliers to produce and invest where they saw fit.[19] While most official histories cite isolated

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[18]Donald Davenport, Chief of the Employment and Occupational Outlook Branch of the US Bureau of Labor Statistics, re-iterated this view in early 1942: "It is obvious that both prime contracts and subcontracts have tended to be distributed in accordance with existing production facilities. Contracts for new industrial facilities, however, have been distributed in such a way as to bring about increased geographical dispersion." US Congress, House, 77th Cong., 2nd Sess., Select Committee Investigating National Defense Migration, *Hearings, Pt. 27 Manpower of the Nation in War Production: Book One* (Washington, DC: GPO, 1942) p. 10258.

[19] Holley notes "Even when the government footed the bill as it did during the fall of 1940, responsible air arm officers were unwilling to ignore the contention of many manufacturers that to build secondary plants in the interior, at a distance from parent plants, would seriously slow down production." Pp. 307-08.

According to US Employment Service (1948), much the same can be said about civilian labor authorities. During the NDAC and OPM periods, the US Employment Service supplied labor market data to the OPM's Plant Site Board, but it was used only to 'a limited degree ... in locating new facilities...In a period of large labor surpluses, manpower implications were of limited importance." Pp. 114. In August 1942, Facilities Clearance Board took over, providing WMC a more formal advisory role in the location of government offices. Supply contracts were still awarded by procurement officers in numerous branches.
WPB Directive No. 2 of March 1942 established procurement policies, including provisions (added at the behest of the WMC and WPB) that agencies take account of critical labor supply conditions. As amended in April 1943, it enjoined procurement agencies "to avoid contracting for production of items or materials in communities or areas in which labor shortages are known to exist, whenever it is practical to procure the needed items or materials elsewhere." After 1942, the USES and later the WMC issued monthly reports designating areas with (I) current labor shortages (II) anticipated labor shortages, and (III) abundant labor

instances of successful application of political pressure or of questionable plant/contract placement, they generally paint a picture of spending decisions that were economically and strategically motivated.

The evidence is clear that politics or peacetime policy objectives played crucial roles in some important wartime spending decisions. Dating back to his service in the Department of the Navy during World War One, Roosevelt had "been enthusiastic for shipyards in the South." Under the chairmanship of Joseph Kennedy in 1938, the US Maritime Commission received congressional permission to grant contracts to shipyards in the South and West despite their higher cost structures (Lane (1951), pp. 102-04). Although the performance of southern shipbuilders remained below eastern levels in the early 1940s, the Commission followed the administration's wishes by granting some wartime contracts to southern yards. Costs and productivity on the West Coast did reach parity with the east by the early 1940s, leading to the placement of large share of contracts there during the war. But the pre-war West possessed no modern integrated steel plants and hence no capacity to produce ship plates locally. In response, Roosevelt had the federal government help finance two new steel plants (at Geneva UT and Fontana, CA) in the West, satisfying another of his long-term policy objectives. In addition, there were numerous accusations of influence peddling, kickbacks, and conflicts of interest regarding defense spending. Notable contracting scandals involved Thomas Corcoran, a New Deal political operative, General Bennett Meyers of the Army Air Crop, Representative Andrew May of Kentucky, chair of the House Committee on Military Affairs, and Senator Theodore Bilbo of Mississippi.[20]

Finally, there is no mistaking that the war era was a period of political flux, as the evidence in Table 4 indicates. On the surface, the Democrats appear uncontestable "in charge" with the Presidency and large majorities in both House of Congress as the war broke out. But FDR's relatively easy victories over Wendell Willkie in 1940 and Thomas Dewey in 1944 should not blind us. (Notice that in each election, the margin of

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even at the war production peak. Headquarters officers accepted the principle of preferring group (III) areas to group (I) but officers in the field did not apply these rules. p. 116 As amended Oct. 10, (1942?), the WMC issued rules that contracts could not be given to Group I areas if other facilities were available; Supply contracts of longer duration than 6 months could not be given to group II areas. Contracting in group III areas was unrestricted.

[20] US Congress, Senate, 76th Cong., 2nd Sess., Special Committee to Investigate the National Defense Programs, *Hearings* (Washington, DC: GPO, 1941-47).

victory was smaller than before.[21]) Roosevelt's success appears in large part a product of his own personal popularity and of the troubled times, rather than the health of his party. The absence of a creditable successor during a period of international crisis motivated Roosevelt's decision to seek his unprecedented third and fourth terms. The Democrat's 1940 campaign slogan "Don't Change Horses in Mid-Stream" apparently captured the mood of many in the electorate. But it also hints that many voters had a desire to change horses, which they might exercise once the stream was forded. Indeed, the experience after World War One suggests that "the return to normalcy" was associated with a change in the party in control.[22]

But the real sign of the extent of political flux during the war period appears in Congress. In the 1942 midterm elections, the Republicans picked up 46 seats in the US House of Representatives, reducing the Democrat's majority from 106 to just 10 seats. Even more striking is that collectively the Republican congressional candidates outpolled the Democrats for the first time since 1930. In the Senate, the Republicans picked up 9 seats in 1942, winning 18 out of the 36 races contested. The Republicans continued to pick up Senate seats in the 1944 elections although they backtracked slightly in the House. And in the 1946 midterm elections, the Republicans won majorities in both House. Given the state of political flux, the allocation of money to improve one's political prospects seems entirely plausible.

III

How important then were political motivations compared with economic and strategic considerations in determining contracting and investment decisions during World War Two? The literature on New Deal spending offers a promising approach to address this question, but it is desirable first to extend the model. This section develops a

[21] Of course, it would have been difficult for FDR to top his1936 landslide when he won 523 electoral college votes to Alfred Landon's 8. The magnitude of this victory margin raises some questions about the relevance on New Deal vote buying, especially in the late 1930s.

[22] Political motivations could remain relevant for explaining spending even if a change in government was guaranteed. Instead of using its spending authority to buy swing voters, the outgoing party could opt to reward its base.

simple model of vote-buying that goes beyond the existing approach by encompassing (1) the allocation of spending across jurisdictions within an election area; and (2) the joint role of Presidential and congressional candidates in determining spending outcomes. The existing historical literature (Wright (1974), Wallis (1987, 1998, 2001)) focuses essentially on the allocation of spending across states to win the Presidency. The central concept is the state's political productivity, which is measured by the its electoral college votes times the change in the probability of winning the state given the historical pattern of the state's election outcomes. The implications are that spending is relatively more productive in states with high electoral votes per capita, with mean vote shares close to one-half, and with higher variances.[23]

The implications of the state-level model do not carry over directly to explaining the allocation of spending within states. Most obviously, the absolute difference of a county's vote from 50 percent has no bearing on the desirably of spending there. Given the variations in the electoral composition, a candidate may be able to spend in areas that both rewards loyal supporters and buys swing votes at the same time. This is not a possibility in the state-level models. More importantly, simple theoretical considerations reveal that the most relevant measure for a county is not its vote share, but rather its net vote margin. To develop these insights further and provide better grounding for our empirical work, we now build a simple model of vote buying at the sub-unit level in winner-take-all elections.[24]

We begin by assuming a politician of the incumbent party, say the Democrats, has a total of Y dollars to spend in his election area. He wishes to allocate these funds across the local jurisdictions to maximize his probability of winning the next election.

Assume each jurisdiction i has a voting population, N_i, composed of three types of voters—loyal Democrats numbering N_{Di}; loyal Republicans numbering N_{Ri}; and swing

[23] The role of variability has been given two interpretations. In the first, states with high variation have a smaller density at one-half and in Wallis's words (1998, p. 148), "require greater expenditures in order to ensure a majority with a given level of confidence." In the second interpretation, variable voters are easier to buy with spending.

[24] The model is similar to Lindbeck and Weibull (1993) who also consider competition for swing voters. The main difference is that they consider a game between two parties for a single election while we consider a single actor who is contesting several elections. Also, the control variable in Lindbeck and Weibull is a single policy over which voters have divergent opinions while our actor allocates a local public good over the different election areas.

voters numbering N_{Si}. Thus $N_i \equiv N_{Di}+N_{Ri}+N_{Si}$. (Note we are assuming each type of voter behaves the same across all of the jurisdictions in the election area. The jurisdictions differ solely in the composition of the electorate across the three groups.) Assume the loyal Democrats and Republicans always turnout to vote for their candidates. Assume that the fraction of swing voters in jurisdiction i casting a Democratic ballot depends on random shock, p, and on per capita spending in the jurisdiction, $y_i \equiv Y_i/N_i$.[25] Specifically, the fraction equals

$$\theta p+(1-\theta)(1+(F(y_i))/2)$$

where $\theta \in [0, 1]$; p has a continuous, differentiable distribution G(x) with G(0)=0, G(1)=1 and density $g(x) \equiv G'(x)>0$; and F(y) is a continuous, concave function such that $F'(y) \equiv f(y)>0$, $F''(y)<0$, F(0)=0, and $F(\infty)=1$. Notice that in the absence of spending, the swing voters favor the Democrats if p>1/2. To simplify notation, let **y** be the vector of the y_i in the election area.

Given y_i and p, the total number of Democratic and Republican votes in jurisdiction i are, respectively:

$$V_{Di} = N_{Di}+N_{Si}\ (\theta p+(1-\theta)(1+F(y_i))/2)$$
$$V_{Ri} = N_{Ri}+N_{Si}\ (\theta\ (1-p)+(1-\theta)(1-F(y_i))/2).$$

The net margin is:

$$V_{Di}-V_{Ri} = N_{Di}-N_{Ri}\ +N_{Si}\ ((2p-1)\theta+(1-\theta)F(y_i)).$$

Notice that the variance in votes in the jurisdiction, $4\theta^2 N_{Si}{}^2 Var(p)$, is increasing in the number of swing voters. Denote $N_X \equiv \Sigma_i N_{Xi}$ for X=D, R, or S, and $V_X \equiv \Sigma_i V_{Xi}$ for X=D or R. Summing up the net margins across jurisdictions, the total net margin is

$$V_D-V_R=\Sigma_i(V_{Di}-V_{Ri}) =\Sigma_i(N_{Di}-N_{Ri}+N_{Si}((2p-1)\ \theta+(1-\theta)F(y_i))).$$

[25] The underlying idea behind this per-capita formulation is that though the politician can determine the number of swing voters in each jurisdiction in his district, he cannot target individual swing voters. Otherwise, he would just buy the cheapest vote he could find.

Given the allocation of spending, **y**, the probability of a Democrat win is:

$$\text{Prob}(V_D>V_R|\mathbf{y})= \text{Prob}[p>1/2-((N_D-N_R+(1-\theta)\Sigma_i N_{Si}F(y_i))/(2\theta N_S))|\mathbf{y}]$$

$$(1) = \begin{cases} 0 & \text{if } (1-\theta)\Sigma_i N_{Si}F(y_i)+ \theta N_S<N_R-N_D \\ 1 - G(\Omega(\mathbf{y})) & \text{if } (1-\theta)\Sigma_i N_{Si}F(y_i)+ \theta N_S<N_R-N_D \\ & \text{and } -(1-\theta)\Sigma_i N_{Si}F(y_i)+ \theta N_S<N_D-N_R \\ 1 & \text{if } -(1-\theta)\Sigma_i N_{Si}F(y_i)+ \theta N_S<N_D-N_R \end{cases}$$

where $\Omega(\mathbf{y}) \equiv 1/2-(N_D-N_R+(1-\theta)\Sigma_i N_{Si}F(y_i))/(2\theta N_S)$.[26]

Now consider the politician's decision to allocate his budget, Y. He chooses **y** to:

(2) Maximize $\text{Prob}(V_D>V_R|\mathbf{y})$ subject to $Y\geq\Sigma_j Y_j$.

Ignoring corners in (1), the objective function may be written as $\text{Prob}(V_D>V_R|\mathbf{y}) = 1 - G(\Omega(\mathbf{y}))$. Since G(x) is monotonically increasing, $\text{argmax}_{\mathbf{y}}\ 1 - G(\Omega(\mathbf{y})) = \text{argmin}_{\mathbf{y}}\ \Omega(\mathbf{y})$. Hence, we will solve the transformed problem:

(3) Minimize $\Omega(\mathbf{y})$ subject to $Y\geq\Sigma_j Y_j$.

Notice that $\Omega(\mathbf{y})$ is convex and decreasing in **y**. The first order condition of (3) states that in all jurisdictions, k, with $N_{Sk}>0$ funds should be allocated according to:

(4) $f(Y_k/N_k)(N_{Sk}/N_k)(1-\theta)/(2\theta N_S)= \psi$.

Notice that the Lagrange multiplier, ψ, from the transformed problem (3) can be related to the multiplier, λ, for the original problem (2) according to $\lambda\equiv\psi g(\Omega(\mathbf{y}))$. Equation (4) means that under the optimal allocation, the value of buying a vote in each jurisdiction is equal. A further interpretation is that at the optimum,

[26] Note if $N_D>N_R+N_S\theta$, the Democrat is guaranteed to win. Similarly if $N_R>N_D+N_S$, a Republican win is assured. There is an asymmetry here because we are assuming the incumbent, who has the ability to buy votes, is a Democrat.

(5) $\psi g(\Omega(\mathbf{y})) \equiv \lambda = \partial \text{Prob}(V_D > V_R)/\partial Y.$

λ has the standard interpretation of the marginal value of an extra dollar of total spending. Inverting (4) yields a formula for optimal spending in k.

(6) $Y_k = N_k f^{-1}(2\psi\theta N_k N_S/(N_{Sk}(1-\theta)))$.

Note because by the concavity of F(y), $df^{-1}(z)/dz<0$. Thus as the fraction of the electorate comprised of swing voters (N_{Sk}/N_k) increases, per capita spending increases.

Note a corner solution, with $Y_k = 0$, is possible under two circumstances. First, there will be no spending in a jurisdiction with no swing votes, $N_{Sk}=0$. Second, in election areas which are non-contested, (that is, with either $N_R > N_S + N_D$ and the Republicans win with probability one or $N_D > N_R + N_S\theta$ and the Democrats win), then any allocation of funds is optimal.[27] Notice that the composition of the electorate in an individual jurisdiction between Democrats and Republicans has no effect, recreating a useful exclusion restriction in the empirical model.

This model readily extended to two-stage, winner-take-all contests such as gaining the Presidency or control of the House or Senate. In such contests, one must win individual elections at the district or state level. The contests may differ in their importance through weights such as the number of votes in the Electoral College.

Consider a model where the Democratic candidate for president seeks to maximizes the expected number of Electoral College votes by winning the state-level contests:

(7) Maximize $\Sigma_C K^C \text{Prob}(V_D{}^C > V_R{}^C | \mathbf{y})$ subject to $Y \geq \Sigma_C \Sigma_j Y_j{}^C$

where K^C is the Electoral College vote of state C and $Y_j{}^C$ is the spending in jurisdiction j in state C. [28] In the spending allocation problem, the candidate uses a two-stage solution. In the first stage, the candidate chooses the level of funds, Y^C, to allocate to the state C.

[27] Once $(1-\text{è})\Sigma_i N_{Si} F(y_j) + \text{è} N_S = N_D - N_R$, a corner-solution again results because effectively ë=0.

[28] Note this model differs slightly for the actual Presidential contest where the candidate seeks to win a majority of the Electoral College votes. But it seems justified by the advantages in claiming a mandate to govern by gaining more than a bare majority of the votes.

In the second stage, the candidate optimally allocates the budgeted funds across the jurisdictions in the state to maximize the probability of success. Using $Y^C \geq \Sigma_j Y_j^C$ in the solution approach discussed above solves the second-stage problem.

Now the solution to the first stage problem associated with (7) is,

(8) $K^C \partial Prob(V_D^C > V_R^C)/\partial Y^C = \mu$

where μ is the Lagrange multiplier on the budget, $Y \geq \Sigma_C Y^C$. This implicitly determines the distribution of spending across states, Y^C. Applying the solution to the second stage given in (4) and (5), this becomes,

(9) $Y_j^C = N_j^C f^{-1}(2\mu\theta N_j^C N_S^C/(K^C N_{Sj}^C(1-\grave{e})g(\Omega^C(\mathbf{y}^C))))$,

Presuming that each jurisdiction is small (implying Y_j^C has a negligible effect on the density $g(\Omega^C(\mathbf{y}^C))$, equation (9) is the formula for optimal spending. It states that spending in a jurisdiction is influenced by state-level variables- -increasing in Electoral College votes and the density of the conditional outcome, and decreasing in swing votes state-wide – and by its own local variables--increasing in the local swing votes.[29]

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[29] A straightforward extension allows this two-stage approach to model the problem of winning or maintaining power in Congress. Congressional districts replace states as the election area and weights (reflecting leadership positions and seniority) may replace the Electoral College votes. One difference is that the Democratic congressional leadership will not want to spend in Republican districts because presumably the Republican incumbent will be able to claim credit for this spending. The net margin equation will be modified to become $V_D - V_R = \Sigma_i(V_{Di} - V_{Ri}) = \Sigma_i(N_{Di} - N_{Ri} + N_{Si}((2p-1)\grave{e} - (1-\grave{e})F(y_i)))$.

The model can be further extended to capture concurrent or overlapping elections, for example, with the President (or Senator) and Representatives running at the same time. Consider the simple example where the R congressional candidates and a presidential candidate are running within a single state. (We will here treat the congressional district as the smallest unit of analysis.) Let vote buying be characterized by joint production with candidates at both levels receiving credit for the spending. More specifically, assume that voters in each district vote a straight ticket, so the congressional and presidential candidates piggy-back perfectly. Further assume the Party assigns a weight $\eth_r$ to congressional candidate r winning his contest and a weight $(1-\Sigma_r\eth_r)$ to the presidential candidate winning the state as a whole. Then the Party's problem is: Maximize $(1-\Sigma_r\eth_r)\, Prob(\Sigma_r V_{Dr} > \Sigma_r V_{Rr} | \mathbf{y}) + \Sigma_r \eth_r Prob(V_{Dr} > V_{Rr} | \mathbf{y})$ subject to $Y \geq \Sigma_r Y_r$. Ignoring non-contested elections, the first-order condition is $(\eth_r + (1-\Sigma_r\eth_r)(N_{Sr}/N_S))(f(Y_r/N_r)/N_r)(1-\grave{e})/2\grave{e} = \ddot{e}$.

The key observation is the presidential candidate cares only about the net margin aggregated across the congressional districts whereas each congressional candidates care only about the net margin in his own district. This will lead to a distortion in spending from the pattern in a President-only contest. Specifically, from the presidential candidate's perspective, spending will be shifted away from safe districts with cheap swing voters to more contested districts with more expensive swing voters. The extent of the distortion will be greater the higher are the $\eth_r$. More powerful representatives, those with a relatively high individual $\eth_r$ in the party's preferences, will be allocated more funds all else equal. This provides a way of testing "whose's in charge?"—Congress or the President.

IV

In our empirical analysis, we investigate the relative importance of political determinants in the geographic distribution of World War Two spending. Our county-level data for military spending, covering the period from June 1940 to June 1945, include total defense spending per capita as well as per capita contracting and facility investment, separately. The distribution of spending at the county level displays two important statistical differences from spending at the state level. First, as noted above, there are numerous "zeros" in the county-level data whereas every state receives positive spending. This requires using different econometric techniques than much of the previous literature. Second, the spending distribution across counties receiving positive levels was highly skewed. Working with per capita spending in logs fits the data better that working with it in linear terms (as Wright (1974) and Wallis (1987, 1998, 2001) did in their studies of the state-level distribution of New Deal spending.)

As a first step in the econometric analysis, it is necessary to modify the vote-buying model of the previous section into a form that can be empirically implemented. The key result of that model was equation (9). Cross-multiplying by N^C, the jurisdiction's size, equation (9) can be re-stated as,

$$(10) \qquad Y_j^C/N_j^C \propto g^C \times (K^C/N^C)(N_s^C/N^C)^{-1}(N_{sj}^C/N_j^C)$$

where the proportionality is used because $f^{-1}(\cdot)$ and various constants are omitted, and g^C is a term which reflects the density of the shock in election area C. Two more steps are needed to take (10) to the data. First, recalling the variance relationships and presuming that vote turnout is proportionate to population,

$$N_{sj}^C/N_j^C \propto \text{Standard Deviation}(DVS_j^C)$$

(11)

$$N_s^C/N^C \propto \text{Standard Deviation}(DVS^C)$$

where $DVS \equiv V_D/N$ is the Democrat's vote share. Second, maintaining the presumption that each jurisdiction is small (so g^C is independent of Y_j^C) and adding the assumption that the density of the shock is a (weakly) single-peaked and symmetric about 0.5,

$$(12) \qquad g^C \propto -|0.5-DVS^C|$$

The right-hand sides of (11) and (12) can be approximated using historical election data (presuming that there was no earlier allocation of funds). Combining (10)-(12), this suggests the regression,

$$(13) \quad \text{Ln}(Y_j^C/N_j^C) = \alpha_1 \times |0.5-DVS^C| + \alpha_2 \times (K^C/N^C) + \alpha_3 \times \text{Standard Deviation}(DVS^C) + \alpha_4 \times \text{Standard Deviation}(DVS_j^C)$$

Theory predicts that $\alpha_1<0$, $\alpha_2>0$, $\alpha_3<0$, $\alpha_4>0$. In words, this regression considers how the allocation of resources to a jurisdiction are influenced by its electoral responsiveness to funding as well as the contestability, political importance and electoral responsiveness of its election area.

In practice, one modification must be made to (13). Because there may be fixed costs to allocating resources to a jurisdiction (such as creating a local monitoring institution) and because small contracts are omitted from the data, jurisdictions may receive a zero allocation even if their election area is not at a corner solution. To the extent that certain variables influence whether any funds are allocated but not the conditional funding level (such as land area), this suggests (13) should be estimated in two parts. We will estimate separate equations for whether a jurisdiction gets funding, and also an equation for the conditional funding intensity. Various estimators of the equations, such as the two-step model and a Heckman sample selection model which allows correlation of the errors, will be considered.

In the above, we have typically interpreted K^C as the number of electoral votes. But note that in a congressional model it can be readily re-interpreted as the individual Senators or Representatives weight in the decision-maker's objective function. In our empirical implication, we can capture this effect by including variables reflecting the politician's position in the congressional power structure such as party, seniority,

leadership position, and membership on the key committees making the allocation decisions.[30] In addition, we can include a variable on the number of representatives per capita (analogous to the number of electoral college votes per capita) to capture the vast inequalities in representation prevailing in the era before the one-man one-vote decision.

To provide a full test of the role of politics, it is important to develop a baseline model capturing the procurement authorities' stated economic and strategic objectives. These included utilizing existing capacity first, decentralizing production away from congested areas with tight labor markets, and locating production in the nation's interior to avoid enemy attack and espionage. To capture these economic objectives, we include two set of variables: (a) measures of under-utilized resources, including the fraction of the labor force which was unemployed in 1940 and the fraction of the county's population in rural areas; and (b) measures of the county's pre-war manufacturing capacity, including the number of wage-earners per capita in 1939 and the number of manufacturing establishments in aircraft, automobile, ordnance, and shipbuilding industries in the county in 1935.[31] (To capture potential spillover effects across county lines, we include measures of manufacturing capacity and population in neighboring counties. A neighboring county was defined as one with its seat of government within forty miles of subject county's seat.)

To capture strategic considerations, we include dummies for whether the county was on the coast or interior. Strategic doctrine, dating to 1915, held that munitions contracts should be placed at least 200 miles from the coastline and the borders with Mexico and Canada. We also include variables for the pre-war military capacity, specifically dummy variables reflecting the presence of an army or navy base in the county in 1937. Most of these bases date to the World War One or before, implying that problems of endogeneity with 1940-era political considerations are likely to be unimportant. (Again to capture spillover effects, we include dummies for the presence of such bases in neighboring counties).

[30] The most relevant committees were Appropriations, Military Affairs, Naval Affairs, Maritime (House only.)

[31] The automobile industry combines "motor vehicles" and "motor vehicle bodies and parts." The ordnance industry combines "firearms" and "ammunition." The year 1935 was chosen both because establishment data were available at the county level (unfortunately due to census disclosure rules, employment and output are not) and to avoid issues of endogeneity whereby the politics of the immediate pre-war period influence the location of these industries.

Table 5 provides the summary statistics for the variables used in the analysis. The Data Appendix contains full details on the data definitions and sources.

V

Table 6 reports the results of our Heckman Maximum Likelihood estimates of the determinants of total spending, facility investment, and contract spending. The Table presents two sets of results for each equation—one using presidential election variables and the second using congressional variables. (Multicolinearity among the election variables complicates efforts to include both sets of variables in a single equation.) We will begin our analysis focusing on the presidential equations (1)-(3). The results for total spending and its subcomponents--facility investment, and contract spending—differ in many details.[32] But a common pattern emerges: money tends allocated to urban counties, those on the coast, and those with pre-existing military or manufacturing capacity. In particular, pre-war military bases were highly important for facility investments. And proximity to pre-war manufacturing capacity (both in terms of specific industries such as shipyards and auto plants and in terms of the density of manufacturing wage-earners) mattered significantly for contract spending. The coefficient of the dummy for shipyards is especially notable. Manufacturing capacity did not have a significant effect on facility investment except for aircraft plants in neighboring counties (and manufacturing wage-earners in the selection equation).[33]

Strategic considerations such as seeking secure areas in the country's interior appear to receive relatively little weight. Comparing the dummy variables for coast and secure reveals that counties on the coast received greater per capita spending than those is areas 200 miles from the nation's border or coastline. (Secure counties did receive more money than non-coastal, non-secure counties.) Objectives such as seeking pockets of

[32] Using a likelihood ratio test, we can reject at even the 99 percent confidence level the hypothesis that common coefficients in the facility investment and contracts equations. This implies that the two types of spending responded differently to the explanatory variables.

[33] Note that in the selection equation that every location possessing either an ordnance or aircraft plant in 1935 receives positive contract spending. These observations are dropped in the selection equation in the two-step Heckman mode. The presence of an ordnance or aircraft plant in a neighboring county has a significant, positive effect on the probability of receiving funding.)

underemployed labor also were unimportant. Spending was strongly negatively correlated with the rural variable in all of the regressions and was unrelated to the county's 1940 unemployment rate. To control for spillover effects between neighboring counties, we included variables for the total population and number of manufacturing wage-earners in the neighboring counties relative to the subject county's population. A higher number of wage-earners nearby tended to increase the county's total and contract spending whereas a larger neighboring population tended to reduce spending in these categories. (These spillover variables had little discernable effect on facility investment.)

Variables capturing the power of the county's congressional members generally lack explanatory power either in the spending equation or in the selection equation.[34] In particular, these findings do not support the view that senior members of the majority party brought home the pork. Actually having a senior senator who is a Republican tends to measurably increase spending (a Hiram Johnson effect?). And longer tenure in the house was associated with less funding. Membership on the house key committee was associated with higher levels of contract spending. We cannot determine whether the membership effect was due to these representatives actually increasing spending in their districts or whether representatives from military-related districts sought membership on these committees. The overall impression for the congressional power coefficients is that they are remarkably small.

The presidential election variables bear a more interesting relationship to spending. In general, there is a U-shaped relationship between Electoral College votes per capita and spend money.[35] Counties in states with a high number of Electoral College votes per capita (extremely small states such as Nevada) and those with low number (populous states such as New York) receive more spending the intermediate states. This makes sense in terms of the standard models of winner-take-all elections. In these models, the value of big states is disproportionately large because their Electoral College delegations are much more likely to be pivotal than those of smaller states. A small state

[34] These results are consistent with Gist and Hill (1984) who find that committee assignments do not have a significant effect on the geographic allocation of funds which are nominally controlled by HUD bureaucrats.

[35] Note the log of electoral college votes per capita is negative and its square positive. Raising the number of electoral votes per capita increases the log term towards zero and reduces its square. Note the electoral votes per capita variables appear to have little effect in the selection equation.

(with a high ratio of Electoral College votes per person) can offset this disadvantage by being so cheap to buy.

The swing voter variables do conform to the theory in the total spending and especially in the facility investments equations. Counties in states where the democratic presidential vote share is closer to 50 percent receive more money. Consistent with the swing-voter story, greater variability of democrat share at the county-level has a significant positive effect on facility investment in the county. Greater variability at the state level has a negative effect, consistent with the interpretation that swing voters are cheaper elsewhere. Finally, loyalty mattered. Counties with traditionally high democratic share received more facilities investment. (This effect does not disappear if a dummy for the South is included.) Note that using county-level allows us to capture this effect – spending where both the candidate's base is strong and the number of swing voters in high—which would be masked in state level analysis.[36]

Turning to the congressional election models, we have replaced presidential variables such as electoral votes per capita with the number of representatives per capita and the historical presidential elections with their congressional analogues.[37] Do these changes make any difference? The fit of the facility equation is slightly better than before, that of the contract spending equation worse. The representation variables behave much as the Electoral College variables did. Spending has a U-shaped pattern with areas with a high number of representatives per capita and those with a low number receiving more spending of each type than those with an intermediate number. This pattern contrasts with results reported in the literature for the recent period where spending rises continuously with representatives per capita.[38] (Under today's one-man one-vote regime, high representation results principally from small state population.) The results for the swing-voter story for the congressional election are more mixed. The "closeness" of the election does not have a significant impact as in the presidential models. The other election variables have similar signs to those in the presidential equation, but the significance levels are lower. Note loyalty to the democrat party still pays. The

[36] Basically in state-level analysis, a strong base would mean the election will not be closely contested and buying votes is unnecessary.
[37] We have made no attempt to include Senator election results to this point.
[38] See Atlas et al (1995) who find that greater per capita Congressional representation, particularly in the Senate, increase federal per capita spending in a state.

coefficient of the democratic share in the facilities investment equation (and as a consequence in the total spending equation) is still strongly positive. Politics matter here, but mainly through rewarding the party faithful rather than buying the swing votes in close elections.

Results in the Two Part Model are shown in Table 7. These estimate the level of spending conditional on receiving funds, ignoring the Heckman sample-selection correction. Notably for our purposes, they are very close to those reported above, providing greater confidence in the robustness of these findings.

To provide a sense of the magnitude of these effects, we will now investigate a series of "experiments." We explore how per capita spending would increase in a county in which key variables were shifted one standard deviation from the mean or for which sets of indicator variables changed from their mean to unity or "on." Specifically, consider the following six experiments: (1) changing all of the swing-voter variables (the electoral college, election closeness, the voter variability terms) one standard in the direction that the theory suggests raises spending; (2) increasing loyalty to the democratic presidential candidate by one standard deviation; (3) shifting all of the discrete congressional power variables (party affiliation, leadership, and committee membership) in the direction of greater power;[39] (4) raising the number of manufacturing wage-earners per capita in the county (and its neighbors) by one standard deviation; (5) shifting all the plant indicators from their mean position to "on"; and finally (6) turning all of the military installations indicators "on."

In all cases, we will use means and standard deviations from the entire population of counties (not just those receiving funds). The baseline value for total spending per capita, derived by taking the exponent of the product of the population means times the coefficients in the presidential equation, is $93. The difference from the national average arises in part from using calculating county means without population weights and from Jensen's inequality (which implies the expectation of the log of a variable differs from the log of its expectation.) See Manning and Mullahy (2001) for a discussion of the difficulties of interpreting log models.

[39] To avoid mixing standard deviation changes and turning "on" indicator variables, we ignore the effects of increasing tenure, which are negative in any case.

The results of these experiments for the presidential total spending are presented in Table 8.

Table 8: Simulated Effects

Experiment	Spending	Change
0. Baseline	$ 93	
1. Swing Voter	$ 134	$ 41
2. Democratic Loyalty	$ 108	$ 15
3. Congressional Power	$ 78	$ (15)
4. Mfg Wage-Earners	$ 246	$ 153
5. War Mfg Plants	$ 611	$ 518
6. Military Bases	$ 380	$ 287

As indicated in experiment 1, the swing-voter variables collectively have an economically meaningful effect on spending—when each is changed one standard deviation in the relevant direction total spending per capita increases by $40. Loyalty also pays—increasing the county's democratic vote share by one standard deviation (that is, 19 percent) above the mean (54 percent) raises spending by $15. Congressional power has little economically meaningful impact. By contrast increasing industrial capacity (measuring either by raising the per capita manufacturing wage-earners variables or by turning the plant dummies "on") has dramatic effects. Increasing the wage-earner variables by one standard deviation raises spending by $153 per capita. Shifting all of the plant variables from their mean positions to "on" increased total spending by $518 dollars. In the final experiment when all of the military base variables are shifted from their means to "on"—roughly the equivalent of the change from the typical county to say Norfolk Virginia, leads to the greatest increase in spending, by $287. The take-home message of this analysis is that politics mattered, especially in the allocation of facility investments, but that the major determinant of the geographic allocation of World War Two spending was the region's pre-1940 military and manufacturing capabilities.

VI

This paper assembles and analyzes a new county-level dataset including economic and political variables to gain a deeper understanding of the geographic distribution of World War Two military spending. Our results indicate that political factors such as electoral importance, party loyalty, and the cost of votes shaped spending decisions on the margin. Congressional power, however, had little apparent impact. In fact, the overwhelming determinant of spending was the pre-existing military installations and manufacturing capacity. The importance of the economic variables in the World War Two period contrasts with the emphasis in the New Deal literature on the primacy of politics. It also suggests that contemporary analysis of determinants of federal resource allocation should play closer attention to economic factors.

Several directions for future research suggest themselves. The first is to conduct a comparable study of the determinants of county-level spending during the New Deal. The second would be to explore how spending during the Second World War affected election outcomes and party affiliation (that is, to estimate a system of equations relating spending and voting). The third and perhaps more fundamental task is to develop more refined measures of the population of swing voters. Relying on the variance of historical outcomes seems less satisfactory than developing a more empirical-based characterization of which demographic groups behaved as swing voters, which shifted between parties, and which were most responsive to economic incentives. More generally, it would be desirable to gain a fuller understanding of the relationship between voting behavior (e.g. partisan turnout) and spending. Finally, future research could develop better measures of the welfare effects of political influence on federal resource allocation.

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Data Appendix

Spending
Ltspc is the log of the county's total spending (in thousands of dollars) to its 1940 population;
Lfacpc is the log of facility investment (in thousands of dollars) per capita;
Lspndpc is the log of major supply contracts (in thousands of dollars) per capita.

Major supply contracts refers to "a prime contract involving a sum of $50,000 or more" awarded "by the War Department, the Navy Department, the Maritime Commission, the Treasury Procurement Division, and the foreign purchasing missions as reported to the War Production Board" over the June 1940 to September 1945 period. The values are net of cancellations and reductions. The contracts were assigned to "the location of the principal producing plants. The assignment of prime contracts to counties, however, may not be exact because of the difficulty involved in making proper assignments. Moreover, work may have been carried out in other counties through subcontracting." They omit contracts that could not be assigned definitely as well as awards for foodstuffs and food processing. "Supply contracts for combat equipment include contracts for aircraft, ships, ordnance, and communication equipment."

"The value of facilities projects represent an estimated of the final cost of each project" undertaken by the WPB between June 1940 and June 1945 with a value of $25,000 or more. It includes facilities "financed by the Army, Navy, Maritime Commission, Defense Plant Corporation, Reconstruction Finance Corporation, and British Empire governments." Industrial facilities "represent manufacturing facilities such as aircraft plants, shipbuilding yards, and metal working plants producing war material." Military facilities "represent cantonments, airports, and other military installations for which direct outlays were made by the armed forces."

Source: County and City Data Book [United States] Consolidated File: County Data, 1944-1977 ICPSR. 7736; United States Department of Commerce. Bureau of the Census and 1947 *County Databook*, pp. xii-xiii.

Population and Labor Force Variable
Pop40 is the county's population in April 1940; **Pop40sq** is Pop40 squared; **Lpop40** is the log of Pop40.

Prural measure the percent rural in 1940 and is calculated as (rural farm pop+rural non-farm pop)/pop40

Unemprt is the unemployment rate in 1940 and is calculated as 1-employment/labor force

Lpoppc is the log of the ratio of the population is neighboring counties to the population in the subject county. If the neighboring county population is zero the log is set equally to the minimum value in the sample. The dummy variable **Dnpoppc** is set to one in this case; zero otherwise.

Source: ICPSR. 7736 County and City Data Book [United States] Consolidated File: County Data, 1944-1977 United States Department of Commerce. Bureau of the Census

Geographic Variables
Landarea is the number of square miles in the county.
Coastal is an indicator for whether the county lies on coastline.
Secure is an indicator for whether the county's seat of government is 200 miles or more from US coastline of borders.

Source: Sechrist, Robert P. *Basic Geographic and Historic Data for Interfacing ICPSR Data Sets, 1620-1983.* [Computer file]. ICPSR version. Baton Rouge, LA: Robert P. Sechrist, LouisianaState University [producer], 1984. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2000. ICPSR 8159 .

Military Bases

Army37 is an indicator for the presence of army post in the county in April 1937; **Navy37** is the same for major navy shore establishments . **NArmy37** and **NNavy37** are indicator variables for the presence of such bases in neighboring counties.

Sources: US War Department, Adjutant General's Office, *Army List and Directory April 20, 1937* (Washington DC: GPO, 1937) pp. 21-29; and US Navy Department, Bureau of Navigation, *Navy Directory, April 1, 1937* (Washington DC: GPO, 1937) pp. 300-11.

Industrial Capacity

Air, **Ship**, **Ord**, and **Auto** are indicators variables for the presence, respectively, of aircraft, shipbuilding, ordnance (ammunition and firearms), and automobile (vehicle industry and motor vehicle body and parts industry) establishments in the county in the 1935 Census of Manufactures.
NAir, **NShip**, **NOrd**, and **Nauto** are indicators for the presence of such establishments in neighboring counties.

Source: Holleran, Owen Cobb. Industrial Market Data Handbook of the United States Bureau of Foreign and Domestic Commerce, Domestic commerce series no. 107; Washington,D.C. U.S. Dept. of Commerce, 1938

Manufacturing Wage-Earners

Lmwepcm is the log of the manufacturing wage-earners in the county in 1939 Census of Manufactures to the 1940 population. If the ratio is zero the log is set equally to the minimum value in the sample. The dummy variable **Dmwepc0** is set to one in this case; zero otherwise.

Lnmwepc is the log of the manufacturing wage-earners in neighboring If the ratio is zero the log is set equally to the minimum value in the sample. The dummy variable **DNmwepc** is set to one in this case; zero otherwise.

Source: ICPSR. 7736 County and City Data Book [United States] Consolidated File: County Data, 1944-1977 United States Department of Commerce. The number of wage-earners in counties with 0-2 establishments is inferred by multiplying the average size (residual wage-earners/ residual establishments) in the state by the number of establishments in the county.

Congressional Power Variables

ssenpar is the senior senator's party in 77th Congress (1942) (demo and fellow travelers=1); **jsenpar** is the same for junior senator
lsten – the log of the combined tenure of senior and junior senators to 1942.
scmt– indicator if a senator serves on Appropriations, Military, or Naval Affairs committee.
slead – indicator (=1) if senator is President Pro Tem in 77th Congress. Glass of VA
hparty – average party of house members in 77th Congress (demo and fellow travelers=1)
lhten – the log of average tenure in house members in months to 1942
hcmt– indicator if a home member serves on Appropriations, Maritime, Military, or Naval Affairs committee.
hlead – indicator if home member is Speaker (Rayburn), Majority Leader (McCormick), or Minority (Martin).

Source: U.S. Congress, *Official Congressional Directory* Official Congressional Directory 77th Cong 2nd Sess, Corrected to Dec. 19. 1941, (Washington DC: U.S. G.P.O.)

Election Variables

Lecvpc is the log of the state's number of Electoral College votes based on the 1940 realignment relative to the state population (in thousands) in 1940. **Lecvpcsq** is its square.

Lrat40 is the log of the number of house member to district's 1940 population based on the 1940 realignment. **Lrat40s** is its square.

Source: U.S. Congress, *Official Congressional Directory* Official Congressional Directory 78th Cong 1nd Sess, Corrected to May 14, 1943, (Washington DC: U.S. G.P.O.)

Sdf50 is the absolute value of the difference of the state's average democrat presidential vote share from 50 percent over the 1920-40 period.

Dm24 is the county's average democrat presidential vote share over the 1920-40 period; **sddm24** is its standard deviation.

sdDdm24 is the standard deviation of the state's democrat presidential vote share over the 1920-40 period.

Cdf50 is the absolute value of the difference of the congressional district's average democrat presidential vote share from 50 percent over the 1932-40 period.

cdm24 is the county's average democrat congressional vote share over the 1920-40 period; **sdcdm24** is its standard deviation.

sdCDdm is the standard deviation of the congressional district's democrat share over the 1932-40 period.

Sources: Clubb, Jerome M., William H. Flanigan, and Nancy H. Zingale, *Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972* [Computer file]. ICPSR ed. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [producer and distributor], 1986. ICPSR 8611 and Inter-university Consortium for Political and Social Research. *United States Historical Election Returns, 1824-1968* [Computer file]. 2nd ICPSR ed. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [producer and distributor], 1999. ICPSR 1. We have corrected this data using state-level election reports.

Note to be consistent with the spending data, the Virginia Independent Cities were assigned to the appropriate counties as follows: Charlottesville (Albemarle); Clifton Forge (Alleghany); Alexandria (Arlington); Staunton (Augusta); Lynchburg (Campbell); Petersburg, Hopewell (Dinwiddle);Wincester (Frederick); Richmond (Henrico); Martinsville (Henry); Williamsburg (James City); Radford (Montgomery); Suffolk (Nansemond); Danville (Pittsylvania); Roanoke City (Roanoke); Buena Vista (Rockbridge); Harrisonburg (Rockingham); Fredricksburg (Spotsylvania); Newport News (Warwick); Bristol (Washington); Norfolk City, Portsmouth, South Norfolk (Norfolk).

Table 1: Cumulative Military Procurement Spending by Quarter and Category, 1940-45

	Total Expenditures	Supply Contract						Facility Projects		
		Total	Aircraft	Ordnance	Ships	Comm. Eqpmt	All Other	Total	Military	Industrial
	(in million)	(in million)	(in million)	(in million)	(in million)	(in million)	(in million)	(in million)	(in million)	(in million)
1940:II	1641	1641	1024	250	87	66	214	--	--	--
1940:III	8007	6487	2288	1135	2423	93	548	1520	949	571
1940:IV	13774	10875	3823	2483	3167	172	1230	2899	1554	1345
1941:I	16867	12920	4094	3155	3713	225	1733	3947	2069	1878
1941:II	24478	19049	6801	4714	4549	393	2592	5429	2753	2676
1941:III	30477	22996	7724	6277	5379	423	3493	7481	3236	4245
1941:IV	39566	29945	10078	8511	6182	752	4722	9621	4205	5416
1942:I	67752	51777	17300	16327	9759	1175	7516	15975	6646	9329
1942:II	88184	67165	20696	21030	12738	2164	10837	21019	8598	12421
1942:III	106801	83533	26789	25316	15430	2681	13617	23268	9679	13589
1942:IV	120515	95810	29990	27834	16939	3374	17973	24705	10418	14287
1943:I	132093	105800	33072	29990	18004	4289	20745	26293	11273	15020
1943:II	151887	124743	40013	33323	21838	5463	24406	27144	11761	15383
1943:III	163640	135163	43346	35323	23375	5979	27440	28115	12136	15925
1943:IV	174443	145425	46168	37818	24640	6944	30155	28656	12309	16293
1944:I	186196	156708	51884	39843	25204	7628	32449	29126	12596	16476
1944:II	200610	170631	56472	43396	26660	8371	36032	29617	12872	16691
1944:III	208455	178158	57503	45232	27631	8717	39429	29935	13048	16833
1944:IV	216626	186083	59503	47652	28002	9128	42152	30181	13171	16956
1945:I	--	--	--	--	--	--	--	--	--	--
1945:II	227715	196004	59337	49468	29724	10188	47286	31771	13602	18110

Sources: Thomas B. Worsley Wartime Economic Stabilization and the Efficiency of Government Procurement Table 37, p. 394
Nelson A. Miller, *State and Regional Market Indicators 1939-45*, Econ. Series 60, p. 28-29.

Table 2: Top Twenty Counties Ranked by Total and Per Capita Spending

	County and State	Total Spending (in thousands)	County and State	Per Capita (in thousands)
1	Wayne, MI	11,753,727	Sarpy, NB	60.80
2	Los Angeles, CA	10,075,835	Orange, TX	38.01
3	Cook, IL	9,250,000	Sagadahoc, TX	26.83
4	Erie, NY	4,739,470	Mineral, NV	22.45
5	Cuyahoga, OH	4,666,873	Contra Costa, CA	20.75
6	Baltimore City, MD	3,914,239	Clark, IN	20.66
7	Hudson, NJ	3,722,262	Warwick, VA	18.86
8	Hartford, CT	3,677,341	Washtenaw, MI	17.82
9	Hamilton, OH	2,867,115	Schenectady, NY	16.21
10	Philadelphia, PA	2,817,073	Jackson, MS	15.85
11	Marion, IN	2,690,993	Clark, WA	14.12
12	Nassau, NY	2,616,102	St. Joseph, IN	12.20
13	Passaic, NJ	2,551,828	Columbia, PA	11.32
14	Oakland, MI	2,541,894	Douglas, KS	10.57
15	King, WA	2,489,474	Moore, TX	10.18
16	Kings, NY	2,388,732	Oakland, MI	10.00
17	New York, NY	2,319,014	New Hanover, NC	9.71
18	San Diego, CA	2,300,747	Sedgwick, KS	9.69
19	St. Louis City, MO	2,224,338	Kenosha, WI	9.59
20	Contra Costa, CA	2,084,314	St. Charles, MO	9.18

Table 3: Evolution of Procurement Policy and Agencies, 1939-45

1939	
Spring	Third revision of Industrial Mobilization Plan completed.
15 July	Crowell Board on Educational Orders established.
9 August	War Resources Board formed "to assist Army and Navy Munitions Board with plans for industrial mobilization."
1 September	Germany invades Poland.
24 November	War Resources Board disbanded after issuing its report.
1940	
16 May	Roosevelt calls for 50,000 war planes.
28 May	Roosevelt establishes National Defense Advisory Commission.
19 June	Roosevelt forms War Cabinet by appointing Republicans Henry Stimson Secretary of War and Frank Knox Secretary of the Navy.
28 June	Act to Expedite National Defense passes, allowing for negotiated contracts in place of competitive bidding.
22 August	Reconstruction Finance Corporation forms Defense Plant Corporation.
29 December	Roosevelt's "Arsenal for Democracy" speech.
1941	
7 January	Office of Production Management established to replace NDAC.
1 March	Senate creates "Truman Committee" to investigate defense program.
11 March	Lend-Lease Act approved.
17 March	OPM Plant Site Committee (later Board) established.
28 August	Supply Priorities and Allocation Board formed with power over OPM.
3 December	Production Requirements plan introduced.
7 December	Pearl Harbor attacked; US enters War.
1942	
16 January	War Production Board formed to replace SPAB.
18 April	War Manpower Commission established.
28 April	Office of Price Administration "freezes prices."
9 June	Smaller War Plants Corporation established.
10 October	WPB directs procurement agencies to avoid "Critical Labor Areas."

2 November	Controlled Materials Program announced.
1943	
27 May	Office of War Mobilization established to "harmonize government activities."
5 November	Truman Committee Report issued.
30 November	WPB announces reconversion policy.
1944	
3 October	Office of War Mobilization and Reconversion established to replace OWM.
1945	
8 May	V-E Day.
2 September	Formal V-J Day.
4 October	WPB terminated, remaining functions transferred to Civilian Production Board.

Sources: US Civilian Production Administration, Bureau of Demobilization, "Chronology of the War Production Board and Predecessor Agencies, August 1939 to November 1945," Historical Reports on War Administration: War Production Board, Misc. Publ. No. 1 (June 20, 1945) and *Industrial Mobilization for War: History of the War Production Board and Predecessor Agencies, 1940-45* Vol. I *Program and Administration*, Historical Reports on War Administration: War Production Board, General Study No. 1 (Washington, DC: GPO, 1947).

Table 4: National Political Balance Following 1932-48 Elections

	Presidential Elections						Congress			
	Electoral College		Popular Vote		Vote Percent		House Seats		Senate Seats	
Election	Dem.	Rep.	Dem.	Rep.	Dem.	Rep.	Dem.	Rep.	Dem.	Rep.
1932	472	59	22810	15759	57.4	39.7	310	117	60	35
1934							319	103	69	25
1936	523	8	27753	16675	60.8	36.5	331	89	76	16
1938							261	164	69	23
1940	449	82	27308	16675	54.7	33.4	268	162	66	28
1942							218	208	58	37
1944	432	99	25607	22015	53.4	45.9	242	190	56	38
1946							188	245	45	51
1948	303	189	24179	21991	49.6	45.1	263	171	54	42

Source: US Historical Statistics Y 79, 135, 204-209

Table 5: Summary Statistics of Variables

Variable		Symbol	Obs	Mean	Std. Dev.	Min	Max
Total Spending		Ltspc	1787	-1.6672	2.0525	-8.1123	4.1077
Facility Investment		Lfacpc	1064	-2.1569	1.9406	-8.1123	3.1114
Contract Spending		Lspndpc	1569	-2.0835	2.0483	-6.8547	4.0708
Land Area		Landarea	3071	968.12	1313.66	22	20131
Population 1940		Pop40	3071	42658.98	144048.80	42	4063342
	squared	Pop40sq	3071	2.260E+10	3.810E+11	1764	1.65E+13
	log	Lpop40	3071	9.8756	1.0611	3.7377	15.2175
Percent Rural 1940		Prural	3071	0.7706	0.2468	0	1
Unemployment Rate 1940		Unemprt	3071	13.6199	6.4207	0.6887	63.3913
Dummy=1 if	Coastal	Coastal	3071	0.1035	0.3047	0	1
	Secure	Secure	3071	0.6115	0.4875	0	1
	Army base present	Army37	3071	0.0485	0.2149	0	1
	in neighbor	Narmy37	3071	0.2042	0.4032	0	1
	Navy base present	Navy37	3071	0.0189	0.1361	0	1
	in neighbor	Nnavy37	3071	0.0866	0.2813	0	1
	Aircraft est. present	Air	3071	0.0147	0.1202	0	1
	in neighbor	Nair	3071	0.0664	0.2491	0	1
	Shipbuilding est. present	Ship	3071	0.0560	0.2300	0	1
	in neighbor	Nship	3071	0.1742	0.3794	0	1
	Ordnance est. present	Ord	3071	0.0081	0.0899	0	1
	in neighbor	Nord	3071	0.0446	0.2065	0	1
	Automobile est. present	Auto	3071	0.0765	0.2659	0	1
	in neighbor	Nauto	3071	0.2927	0.4551	0	1
Manufacturing wage-earners per capita		Lmwepcm	3071	-4.6292	1.7499	-9.1371	-0.8129
	dummy if zero	Dmwepc0	3071	0.0368	0.1883	0	1
Wage-earners in neighboring counties		LNmwepc	3071	-2.3568	2.6416	-10.1446	5.2862
	dummy if zero	DNmwepc	3071	0.0524	0.2229	0	1
Population in neighboring counties		LNpoppc	3071	1.7389	1.5110	-2.8650	7.8195
	dummy if zero	DNpoppc	3071	0.0466	0.2107	0	1
Dummy =1 if	Senior senator democrat	Ssparty	3071	0.7457	0.4355	0	1
	Junior senator democrat	Jsparty	3071	0.6998	0.4584	0	1
	Representative democrat	Hparty	3071	0.6220	0.4838	0	1
	Senate leadership	Slead	3071	0.0326	0.1775	0	1
	House leadership	Hlead	3071	0.0033	0.0570	0	1
	Senate committee	Scmt	3071	0.6972	0.4596	0	1
	House committee	Hcmt	3071	0.2210	0.4130	0	1
Tenure of	Senators	Lsten	3071	4.4691	0.6125	2.4849	5.2883
	Representatives	Lhten	3071	4.0051	1.0223	-1.3863	5.9135
Electoral college votes per capita		Lecvpc	3071	-5.4443	0.2596	-5.6587	-3.6019
	squared	Lecvpcsq	3071	29.7079	2.6201	12.9735	32.0213
Representatives per capita		Lrrat40	3071	1.2520	0.2302	0.2824	2.2050
	squared	Lrrat40s	3071	1.6206	0.6007	0.0797	4.8622

Table 5: Summary Statistics of Variables continued

Closeness of Election: State Presidential	Sdf50	3071	0.1217	0.1005	0.0010	0.4585
Congressional	Cdm50	3071	0.2145	0.1812	0.00050	0.5
Democrat Share: County Presidential	Dm24	3071	0.5467	0.1916	0.096	1
County congressional	Cdm24	3071	0.5865	0.2761	0	1
County St. Deviation: Presidential	Sddm24	3071	0.1391	0.0612	0	0.3596
Congressional	Sdcdm24	3071	0.0969	0.0616	0	0.3858
Election St. Deviation: Presidential	SdSdm24	3071	0.1390	0.0463	0.0273	0.2389
Congressional	SdCDdm	3071	0.0575	0.0465	0	0.3017

See Data Appendix for Definitions and Sources

TABLE 6: HECKMAN MAXIMUM LIKELIHIOOD ESTIMATES

		Presidential election variables			Congressional election variables		
		LTSPC	LFACPC	LCONTPC	LTSPC	LFACPC	LCONTPC
Log of Pop40	Coef.	-0.2957	-0.6551	0.1546	-0.2855	-0.6887	0.1596
	Std. Err.	0.0776	0.1043	0.0809	0.0748	0.1009	0.0785
Percent rural	Coef.	-2.9678	-1.2592	-2.4877	-2.9359	-1.2874	-2.5154
	Std. Err.	0.2516	0.3582	0.2540	0.2523	0.3612	0.2545
Unemployment Rate	Coef.	-0.0091	0.0129	-0.0101	-0.0051	0.0215	-0.0093
	Std. Err.	0.0075	0.0107	0.0075	0.0074	0.0107	0.0075
Coast Dummy	Coef.	0.2810	0.1631	0.1926	0.2703	0.1348	0.1846
	Std. Err.	0.1436	0.1783	0.1411	0.1449	0.1804	0.1430
Secure	Coef.	0.0217	-0.0586	0.1259	0.0515	0.0541	0.1298
	Std. Err.	0.1083	0.1522	0.1061	0.1060	0.1478	0.1042
Army base	Coef.	0.2808	0.5251	0.0107	0.2596	0.5382	0.0043
	Std. Err.	0.1705	0.1972	0.1651	0.1704	0.1973	0.1658
Neighbor	Coef.	0.1133	0.0590	0.0040	0.1127	0.1172	-0.0083
	Std. Err.	0.1160	0.1576	0.1116	0.1156	0.1567	0.1116
Navy Base	Coef.	0.6878	0.9581	-0.2842	0.7607	0.9671	-0.2641
	Std. Err.	0.2573	0.2824	0.2535	0.2572	0.2824	0.2551
Neighbor	Coef.	0.3211	0.2498	0.3400	0.3353	0.3029	0.3288
	Std. Err.	0.1675	0.2250	0.1576	0.1669	0.2233	0.1579
Aircraft	Coef.	0.1956	0.2071	0.2392	0.1056	0.1190	0.1885
	Std. Err.	0.2869	0.3184	0.2675	0.2888	0.3218	0.2707
Neighbor	Coef.	0.1965	0.4912	0.0177	0.1715	0.4911	-0.0094
	Std. Err.	0.1668	0.2220	0.1559	0.1675	0.2225	0.1573
Shipbuilding	Coef.	0.4664	0.3367	0.5429	0.4458	0.3511	0.5207
	Std. Err.	0.1726	0.2020	0.1648	0.1727	0.2025	0.1656
Ordnance	Coef.	0.3244	0.2403	0.2335	0.4241	0.3498	0.2867
	Std. Err.	0.3524	0.4090	0.3267	0.3535	0.4115	0.3296
Neighbor	Coef.	0.4505	0.1680	0.3440	0.4609	0.1729	0.3712
	Std. Err.	0.1427	0.1733	0.1330	0.1425	0.1728	0.1334

Automobile	Coef.	0.1940	0.0956	0.1827	0.2285	0.1100	0.2362
	Std. Err.	0.1124	0.1622	0.1081	0.1118	0.1616	0.1081
Wage-earners per capita	Coef.	0.3336	-0.0452	0.6274	0.3417	-0.0311	0.6207
	Std. Err.	0.0471	0.0633	0.0500	0.0471	0.0633	0.0501
Wage-earners in neighbors	Coef.	-0.3097	-0.1338	-0.1374	-0.3078	-0.1227	-0.1511
	Std. Err.	0.0971	0.1305	0.0976	0.0959	0.1290	0.0975
Population in neighbors	Coef.	0.1459	-0.0559	0.1652	0.1472	-0.0627	0.1803
	Std. Err.	0.0595	0.0811	0.0618	0.0592	0.0807	0.0617
Senior senator democrat	Coef.	-0.3263	-0.1558	-0.2147	-0.3906	-0.2038	-0.2767
	Std. Err.	0.1357	0.1811	0.1305	0.1381	0.1834	0.1319
Junior senator democrat	Coef.	0.1971	0.2260	0.1904	0.2331	0.0323	0.3072
	Std. Err.	0.1270	0.1713	0.1235	0.1239	0.1670	0.1210
Senate leadership	Coef.	-0.0893	-0.0018	0.0724	-0.1680	0.1273	-0.0171
	Std. Err.	0.2331	0.3672	0.2237	0.2385	0.3746	0.2305
Senate tenure	Coef.	0.0880	0.0243	0.0450	0.0933	0.1076	0.0212
	Std. Err.	0.0762	0.1122	0.0736	0.0781	0.1139	0.0760
Senate committee	Coef.	-0.1328	-0.3054	-0.1371	-0.1223	-0.0682	-0.2053
	Std. Err.	0.1151	0.1589	0.1134	0.1184	0.1639	0.1167
Representative democrat	Coef.	0.0679	0.0906	0.1102	-0.0114	0.1014	0.0135
	Std. Err.	0.1192	0.1642	0.1181	0.1202	0.1638	0.1187
House leadership	Coef.	0.0924	-0.3712	0.0289	0.0779	-0.4151	0.1004
	Std. Err.	0.6082	0.7553	0.5643	0.6067	0.7543	0.5651
House tenure	Coef.	-0.1210	-0.0308	-0.1427	-0.0787	-0.0429	-0.1057
	Std. Err.	0.0425	0.0584	0.0425	0.0424	0.0579	0.0429
House committee	Coef.	0.0140	-0.2201	0.1887	0.0079	-0.2870	0.1862
	Std. Err.	0.0963	0.1330	0.0932	0.0966	0.1336	0.0945
Electoral college votes	Coef.	10.2616	2.7461	12.2712	-2.4910	-4.3742	-1.3528
(Representatives) per capita	Std. Err.	2.9565	3.6849	3.4483	1.1063	1.4561	1.1260
squared	Coef.	0.9987	0.2232	1.2204	0.9637	1.6398	0.5472
	Std. Err.	0.2928	0.3684	0.3380	0.4362	0.5742	0.4487
Closeness of Election	Coef.	-0.7330	-2.1446	0.0156	-0.5905	-0.0814	-0.1673
	Std. Err.	0.6015	0.8892	0.5915	0.3709	0.5284	0.3774

Democrat vote share	Coef.	0.7759	2.0464	-0.0932	1.1408	1.5896	0.1918
	Std. Err.	0.4014	0.5993	0.4002	0.3109	0.4427	0.3183
County st. deviation	Coef.	1.6140	3.2234	-0.4732	-0.2679	2.0450	-0.3755
	Std. Err.	1.1263	1.5784	1.1430	0.8607	1.2294	0.8764
Election st. deviation	Coef.	-2.9998	-5.5681	1.2817	1.2887	-2.0823	0.9468
	Std. Err.	1.5695	2.1937	1.5592	1.0351	1.3726	1.0348
SELECTION							
Land Area	Coef.	6.45E-05	1.10E-04	2.16E-05	2.95E-05	9.86E-05	3.74E-06
	Std. Err.	3.48E-05	3.26E-05	3.52E-05	3.21E-05	3.04E-05	3.23E-05
Population 1940	Coef.	2.90E-05	1.66E-05	3.42E-05	3.28E-05	1.76E-05	3.70E-05
	Std. Err.	3.57E-06	2.17E-06	3.43E-06	3.50E-06	2.14E-06	3.37E-06
squared	Coef.	-1.11E-11	-4.17E-12	-1.27E-11	-1.25E-11	-4.43E-12	-1.38E-11
	Std. Err.	5.20E-12	1.19E-12	3.80E-12	3.01E-12	1.10E-12	2.77E-12
Percent rural	Coef.	-2.2592	-1.7684	-2.1197	-2.1769	-1.7602	-2.0041
	Std. Err.	0.2008	0.1728	0.1984	0.2003	0.1739	0.1992
Unemployment Rate	Coef.	-0.0030	-0.0076	0.0049	-0.0005	-0.0063	0.0075
	Std. Err.	0.0050	0.0050	0.0052	0.0049	0.0049	0.0051
Coast Dummy	Coef.	0.4083	0.5273	0.1046	0.4339	0.5525	0.1308
	Std. Err.	0.1446	0.1185	0.1383	0.1457	0.1207	0.1397
Secure	Coef.	0.1476	0.0647	0.1447	0.2033	0.1090	0.1831
	Std. Err.	0.0859	0.0778	0.0885	0.0832	0.0757	0.0861
Army base	Coef.	0.6933	0.5407	0.1298	0.6873	0.5307	0.1202
	Std. Err.	0.3088	0.1926	0.2388	0.3056	0.1925	0.2386
Neighbor	Coef.	-0.0064	0.1537	-0.0708	-0.0264	0.1437	-0.0832
	Std. Err.	0.0987	0.0878	0.1002	0.0979	0.0872	0.0993
Navy Base	Coef.	1.4190	2.3616	-0.0060	1.3618	2.3736	-0.0036
	Std. Err.	0.6200	0.6046	0.4231	0.6234	0.6008	0.4208
Neighbor	Coef.	-0.1362	0.0043	0.0118	-0.1293	0.0041	0.0090
	Std. Err.	0.1473	0.1337	0.1465	0.1475	0.1341	0.1464
Aircraft	Coef.	65.5919	0.3597	74.3440	74.1838	0.3822	80.5806
	Std. Err.	3.39E+04	0.6757	3.37E+05	2.82E+04	0.6821	1.86E+05

Neighbor	Coef.	0.3716	-0.1151	0.4077	0.4124	-0.0789	0.4363
	Std. Err.	0.1923	0.1455	0.1928	0.1925	0.1460	0.1932
Shipbuilding	Coef.	0.3254	0.3057	0.3856	0.3788	0.3031	0.4367
	Std. Err.	0.2751	0.1758	0.2444	0.2736	0.1761	0.2431
Ordnance	Coef.	5.5384	0.0791	6.3217	5.5002	0.0705	6.0648
	Std. Err.	3.17E+04	0.4800	1.27E+06	2.75E+04	0.4790	4.67E+05
Neighbor	Coef.	0.5046	0.2787	0.4663	0.4922	0.2823	0.4475
	Std. Err.	0.2503	0.1784	0.2512	0.2480	0.1783	0.2476
Automobile	Coef.	0.4914	0.2707	0.7889	0.4883	0.2794	0.7754
	Std. Err.	0.3045	0.1477	0.3125	0.3018	0.1482	0.3094
Wage-earners per capita	Coef.	0.3693	0.1263	0.4339	0.3678	0.1255	0.4357
	Std. Err.	0.0284	0.0276	0.0305	0.0286	0.0276	0.0307
Wage-earners in neighbors	Coef.	-0.2081	-0.0633	-0.2169	-0.1696	-0.0372	-0.1918
	Std. Err.	0.0771	0.0714	0.0794	0.0759	0.0711	0.0784
Population in neighbors	Coef.	0.0780	-0.0176	0.1522	0.0854	-0.0218	0.1623
	Std. Err.	0.0415	0.0397	0.0443	0.0413	0.0395	0.0441
Senior senator democrat	Coef.	-0.1183	-0.1286	-0.2184	-0.1443	-0.1294	-0.2402
	Std. Err.	0.1272	0.1091	0.1297	0.1359	0.1145	0.1379
Junior senator democrat	Coef.	0.0526	0.1256	0.1123	0.1194	0.1491	0.1490
	Std. Err.	0.1079	0.0970	0.1105	0.1044	0.0942	0.1078
Senate leadership	Coef.	0.0233	-0.1633	0.0894	0.1154	-0.1400	0.2176
	Std. Err.	0.1786	0.1791	0.1760	0.1843	0.1841	0.1823
Senate tenure	Coef.	0.1571	0.0568	0.1180	0.1893	0.0454	0.1659
	Std. Err.	0.0610	0.0563	0.0622	0.0639	0.0584	0.0649
Senate committee	Coef.	0.1773	0.0257	0.1228	0.1819	0.0312	0.1647
	Std. Err.	0.0870	0.0823	0.0887	0.0915	0.0854	0.0939
Representative democrat	Coef.	0.0750	-0.0511	0.1083	0.0458	-0.0792	0.0843
	Std. Err.	0.0924	0.0863	0.0957	0.0942	0.0877	0.0979
House leadership	Coef.	0.9122	0.3323	1.2733	0.7319	0.2246	1.1032
	Std. Err.	0.8963	0.5803	1.0302	0.9105	0.5799	1.0285
House tenure	Coef.	-0.0042	-0.0195	0.0039	0.0161	-0.0076	0.0173
	Std. Err.	0.0324	0.0306	0.0334	0.0322	0.0305	0.0332

House committee	Coef.	0.0861	-0.0501	0.1518	0.0681	-0.0560	0.1515
	Std. Err.	0.0796	0.0724	0.0810	0.0794	0.0728	0.0806
Electoral college votes	Coef.	0.9438	0.0576	0.8972	-0.2572	1.3389	-1.2205
(Representatives) per capita	Std. Err.	1.8931	1.8888	2.0795	0.8096	0.8394	0.8650
Squared	Coef.	0.1193	0.0290	0.0850	0.1998	-0.4852	0.5455
	Std. Err.	0.1900	0.1882	0.2076	0.3101	0.3226	0.3329
Closeness of Election	Coef.	-0.6819	-0.3725	-0.5385	-0.5925	0.0407	-0.9380
	Std. Err.	0.4423	0.4221	0.4464	0.2815	0.2596	0.2874
Democrat vote share	Coef.	-0.1995	0.1616	-0.2650	0.2001	0.1390	0.3277
	Std. Err.	0.2820	0.2774	0.2892	0.2295	0.2192	0.2370
County st. deviation	Coef.	-1.8947	-0.0383	-2.8436	-0.4183	-0.1378	-1.0049
	Std. Err.	0.8078	0.7680	0.8414	0.6287	0.6081	0.6467
Election st. deviation	Coef.	-0.8592	-0.7656	-0.8297	-0.5703	0.2557	-0.8527
	Std. Err.	1.1787	1.0997	1.2183	0.8638	0.7834	0.8713
Rho	Coef.	0.0447	-0.1681	0.2840	0.0428	-0.1634	0.2732
	Std. Err.	0.0678	0.0850	0.0778	0.0680	0.0871	0.0775
Sigma	Coef.	1.6631	1.7818	1.5384	1.6624	1.7806	1.5450
	Std. Err.	0.0279	0.0406	0.0296	0.0279	0.0405	0.0295
Lambda	Coef.	0.0744	-0.2995	0.4369	0.0711	-0.2910	0.4220
	Std. Err.	0.1128	0.1536	0.1230	0.1131	0.1571	0.1229
No. of Observations		3071	3071	3071	3071	3071	3071
Censored		1284	2007	1502	1284	2007	1502
Uncensored		1787	1064	1569	1787	1064	1569
Log Likelihood		-4590.44	-3390.725	-3940.908	-4591.77	-3394.36	-3966.94

Notes:
To save space, results for the presence of industries and military bases in neighboring counties are not displayed when statistically insignificantly different from zero. Constant and Dummies for zero logs also omitted.
Note positive Ord and Air perfectly associated with positive spending.

TABLE 7 :TWO PART REGRESSION RESULTS

		Presidential election variables			Congressional election variables		
		LTSPC	LFACPC	LSPNDPC	LTSPC	LFACPC	LSPNDPC
Log of Pop40	Coef.	-0.3040	-0.6100	0.0761	-0.2947	-0.6425	0.0812
	Std. Err.	0.0794	0.0984	0.0809	0.0769	0.0956	0.0782
Percent rural	Coef.	-2.9208	-1.5275	-2.2344	-2.8931	-1.5464	-2.2873
	Std. Err.	0.2400	0.3179	0.2518	0.2414	0.3194	0.2556
Unemployment Rate	Coef.	-0.0088	0.0109	-0.0096	-0.0049	0.0198	-0.0089
	Std. Err.	0.0084	0.0120	0.0083	0.0084	0.0121	0.0084
Coast Dummy	Coef.	0.2762	0.2033	0.1763	0.2656	0.1717	0.1708
	Std. Err.	0.1438	0.1749	0.1465	0.1484	0.1807	0.1503
Secure	Coef.	0.0195	-0.0646	0.1020	0.0491	0.0506	0.1111
	Std. Err.	0.1081	0.1668	0.1050	0.1052	0.1612	0.1023
Army base	Coef.	0.2801	0.5494	0.0219	0.2593	0.5599	0.0157
	Std. Err.	0.1515	0.1535	0.1617	0.1533	0.1542	0.1621
Neighbor	Coef.	0.1140	0.0833	0.0143	0.1138	0.1402	0.0036
	Std. Err.	0.1130	0.1672	0.1104	0.1131	0.1660	0.1107
Navy Base	Coef.	0.6864	1.0047	-0.2506	0.7593	1.0157	-0.2319
	Std. Err.	0.2392	0.2286	0.2215	0.2471	0.2331	0.2221
Neighbor	Coef.	0.3246	0.2569	0.3604	0.3390	0.3081	0.3507
	Std. Err.	0.1666	0.2267	0.1613	0.1643	0.2234	0.1604
Aircraft	Coef.	0.2151	0.1398	0.3689	0.1241	0.0554	0.3136
	Std. Err.	0.2437	0.2553	0.2341	0.2408	0.2575	0.2367
Neighbor	Coef.	0.1950	0.4827	0.0117	0.1693	0.4882	-0.0199
	Std. Err.	0.1670	0.2160	0.1634	0.1656	0.2166	0.1631
Shipbuilding	Coef.	0.4732	0.3247	0.5659	0.4521	0.3392	0.5419
	Std. Err.	0.1582	0.1758	0.1670	0.1589	0.1793	0.1659
Ordnance	Coef.	0.3352	0.1949	0.3060	0.4350	0.3062	0.3571
	Std. Err.	0.2874	0.3813	0.2413	0.2969	0.3815	0.2435
Automobile	Coef.	0.4601	0.1624	0.3854	0.4704	0.1664	0.4147
	Std. Err.	0.1123	0.1742	0.1193	0.1119	0.1711	0.1202

Wage-earners per capita	Coef.	0.3215	-0.0144	0.5487	0.3301	-0.0005	0.5454
	Std. Err.	0.0531	0.0660	0.0574	0.0527	0.0652	0.0571
Wage-earners in neighbors	Coef.	0.1459	-0.0609	0.1520	-0.3064	-0.1368	-0.1382
	Std. Err.	0.0619	0.0814	0.0613	0.0953	0.1279	0.0896
Population in neighbors	Coef.	-0.3074	-0.1492	-0.1233	0.1469	-0.0663	0.1648
	Std. Err.	0.0959	0.1292	0.0902	0.0605	0.0797	0.0603
Senior senator democrat	Coef.	-0.3213	-0.1927	-0.1817	-0.3871	-0.2354	-0.2534
	Std. Err.	0.1295	0.1821	0.1231	0.1307	0.1792	0.1244
Junior senator democrat	Coef.	0.1940	0.2563	0.1650	0.2290	0.0644	0.2778
	Std. Err.	0.1281	0.1712	0.1218	0.1230	0.1649	0.1188
Senate leadership	Coef.	-0.0910	-0.0099	0.0589	-0.1713	0.1193	-0.0350
	Std. Err.	0.2320	0.3823	0.2081	0.2362	0.3875	0.2126
Senate tenure	Coef.	0.0865	0.0219	0.0406	0.0917	0.1013	0.0151
	Std. Err.	0.0777	0.1245	0.0748	0.0808	0.1231	0.0789
Senate committee	Coef.	-0.1355	-0.3002	-0.1539	-0.1245	-0.0660	-0.2204
	Std. Err.	0.1204	0.1681	0.1176	0.1222	0.1691	0.1190
Representative democrat	Coef.	0.0663	0.0876	0.0968	-0.0113	0.0893	0.0135
	Std. Err.	0.1196	0.1679	0.1126	0.1195	0.1633	0.1154
House leadership	Coef.	0.0866	-0.3931	-0.0364	0.0754	-0.4405	0.0532
	Std. Err.	0.3917	0.3176	0.5897	0.3697	0.3085	0.5821
House tenure	Coef.	-0.1209	-0.0370	-0.1438	-0.0791	-0.0469	-0.1086
	Std. Err.	0.0432	0.0568	0.0435	0.0434	0.0550	0.0442
House committee	Coef.	0.0122	-0.2102	0.1733	0.0064	-0.2760	0.1717
	Std. Err.	0.0958	0.1369	0.0910	0.0977	0.1386	0.0940
Electoral college votes	Coef.	10.2595	3.1527	12.6322	-2.4853	-4.3875	-1.2128
(Representatives) per capita	Std. Err.	3.3947	3.1657	4.7497	1.1865	1.1983	1.1834
squared	Coef.	0.9981	0.2643	1.2563	0.9596	1.6456	0.4836
	Std. Err.	0.3334	0.3233	0.4582	0.4847	0.4944	0.4853
Closeness of Election	Coef.	-0.7220	-2.1640	0.0484	-0.5810	-0.0904	-0.0706
	Std. Err.	0.6186	0.9036	0.6106	0.3955	0.5841	0.3850

Democrat vote share	Coef.	0.7810	2.0146	-0.0417	1.1387	1.6057	0.1745
	Std. Err.	0.4166	0.6513	0.4039	0.3157	0.4969	0.3126
County st. deviation	Coef.	1.6932	3.1678	0.2683	-0.2416	2.0201	-0.1036
	Std. Err.	1.1303	1.7036	1.0756	0.9184	1.2929	0.9117
Election st. deviation	Coef.	-3.0083	-5.7126	0.9829	1.2716	-1.9515	0.7382
	Std. Err.	1.5844	2.3644	1.5370	1.0585	1.5192	1.0000
No. of Observations		1787	1064	1569	1787	1064	1569
R-squared =		0.343	0.1662	0.4477	0.344	0.1667	0.442
Root MSE =		1.681	1.8046	1.5411	1.6804	1.804	1.549

To save space, results for the presence of industries and military bases in neighboring counties are not displayed when statistically insignificantly different from zero. Constant and Dummies for zero logs also omitted.

Standard Errors are Robust

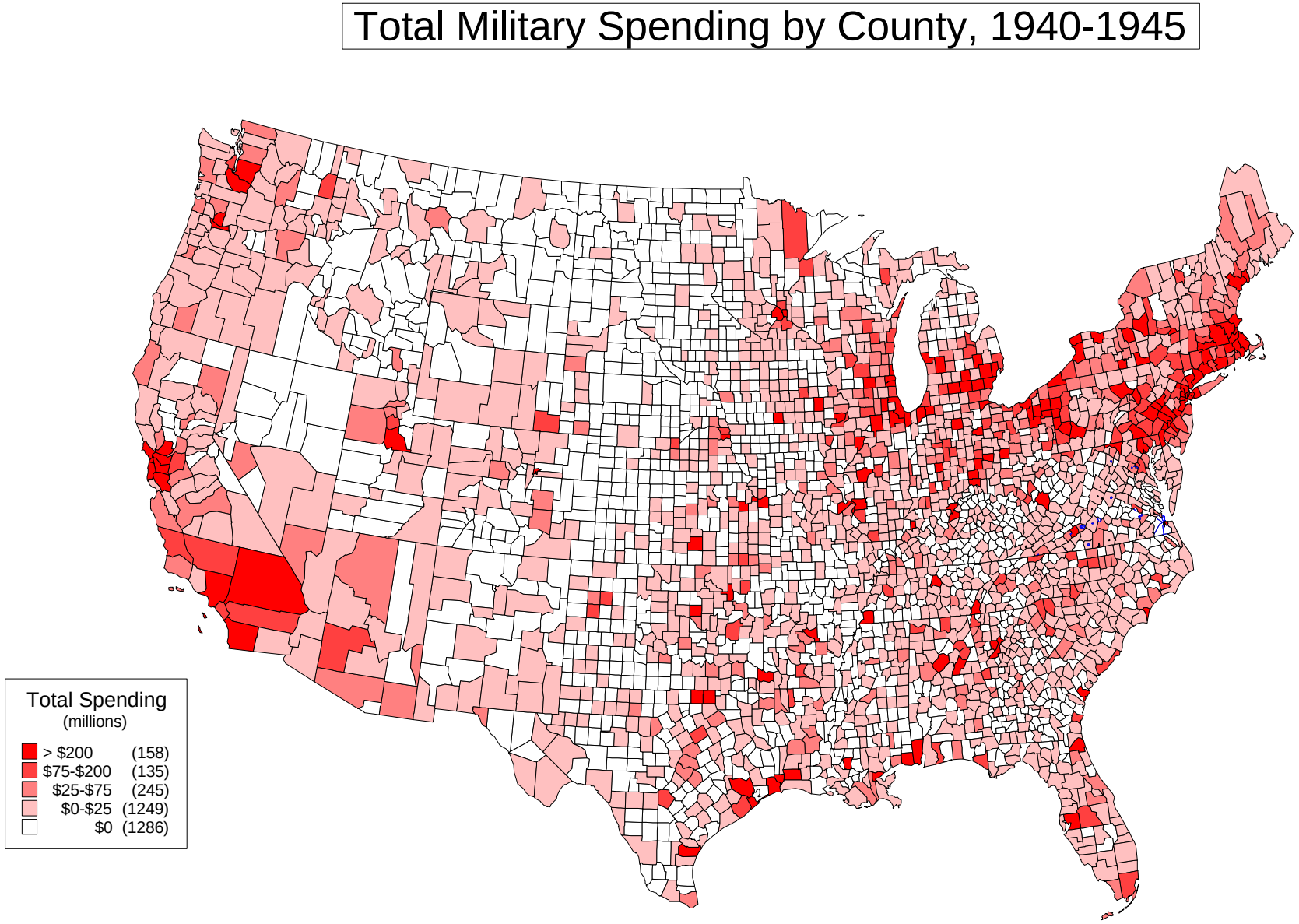
Total Military Spending by County, 1940-1945
Total Spending
(millions)
> $200 (158)
$75-$200 (135)
$25-$75 (245)
$0-$25 (1249)
$0 (1286)

Figure 1

Contract Spending by County, 1940-1945

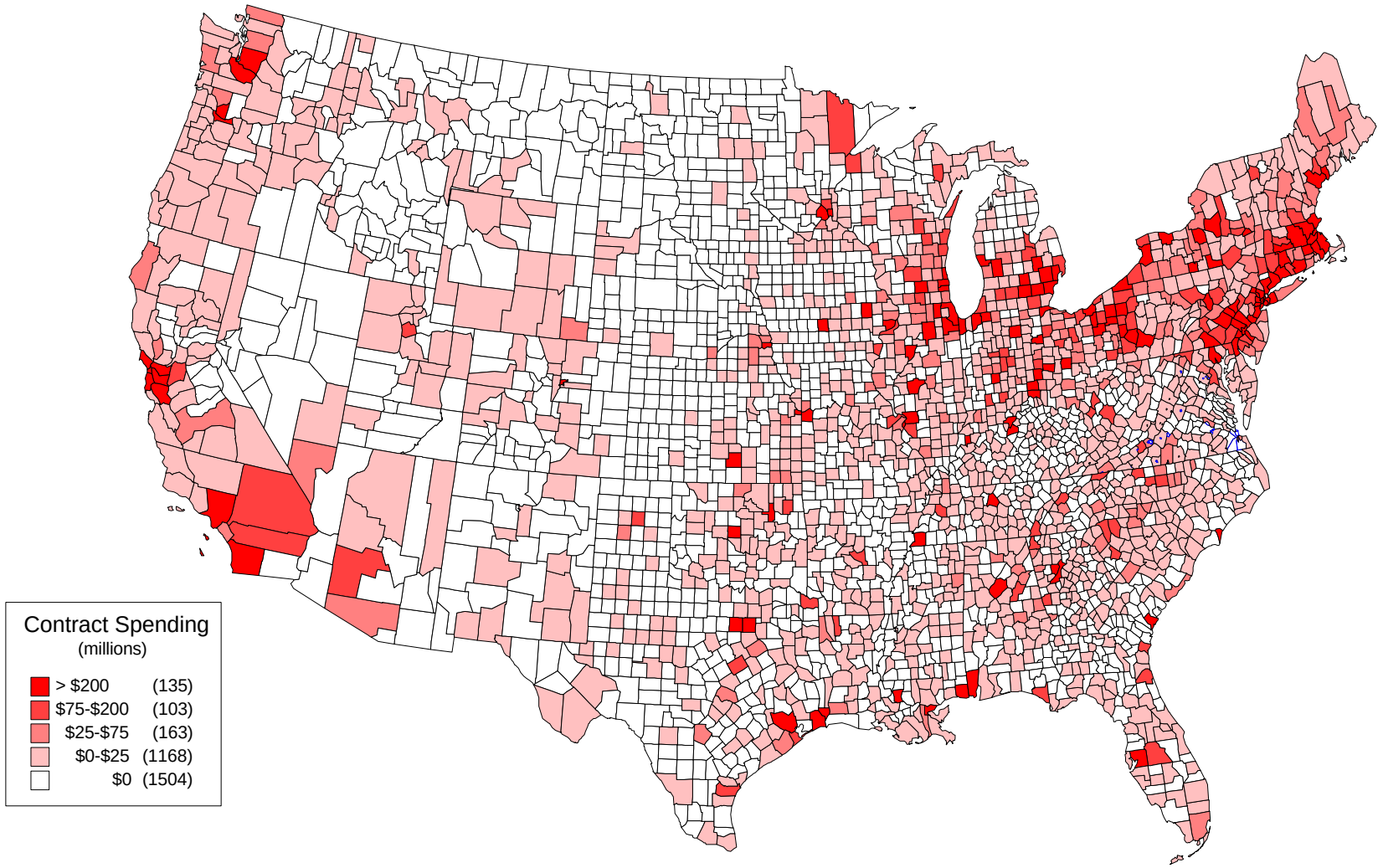

Figure 2

Facility Spending by County, 1940-1945

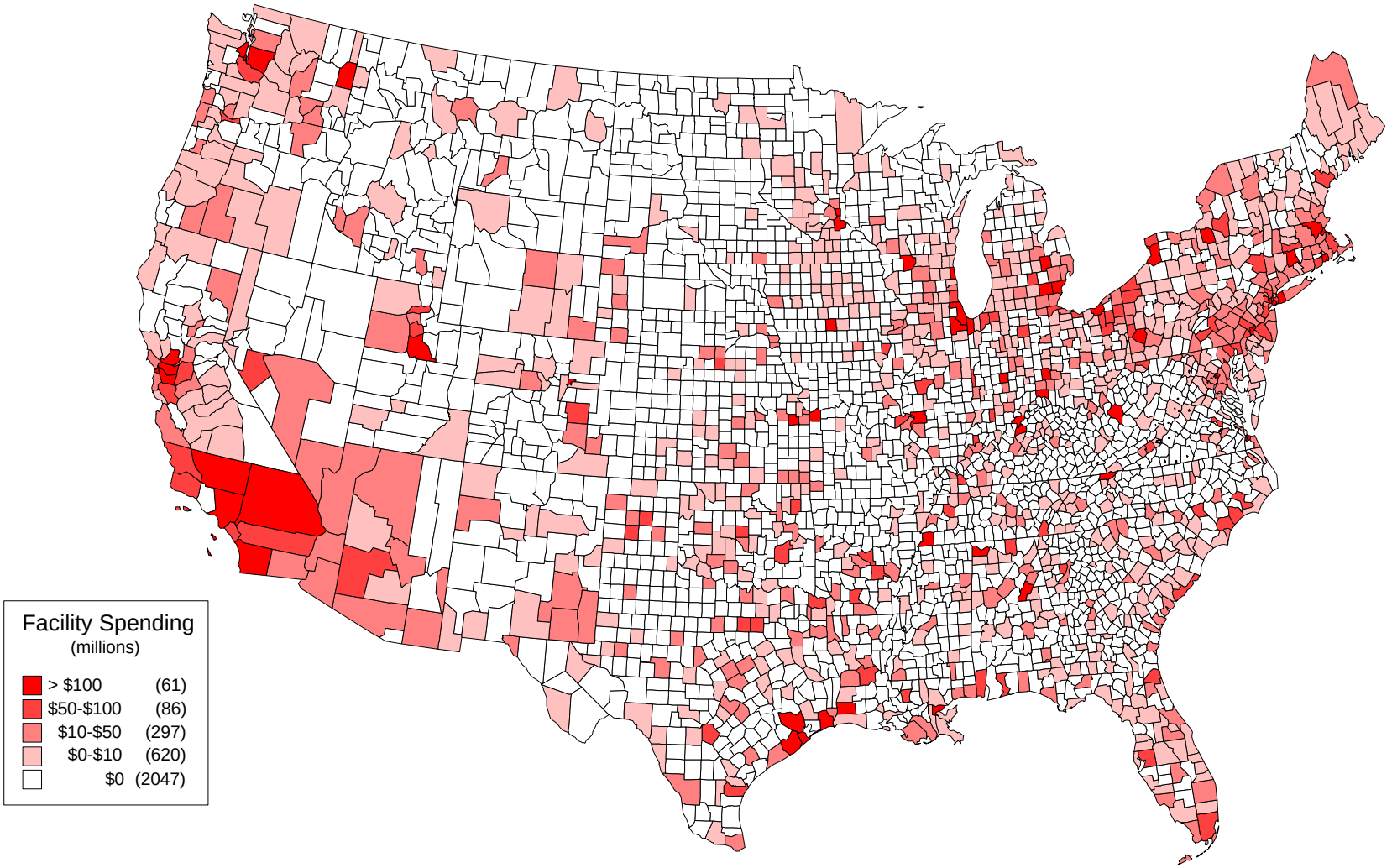

Figure 3

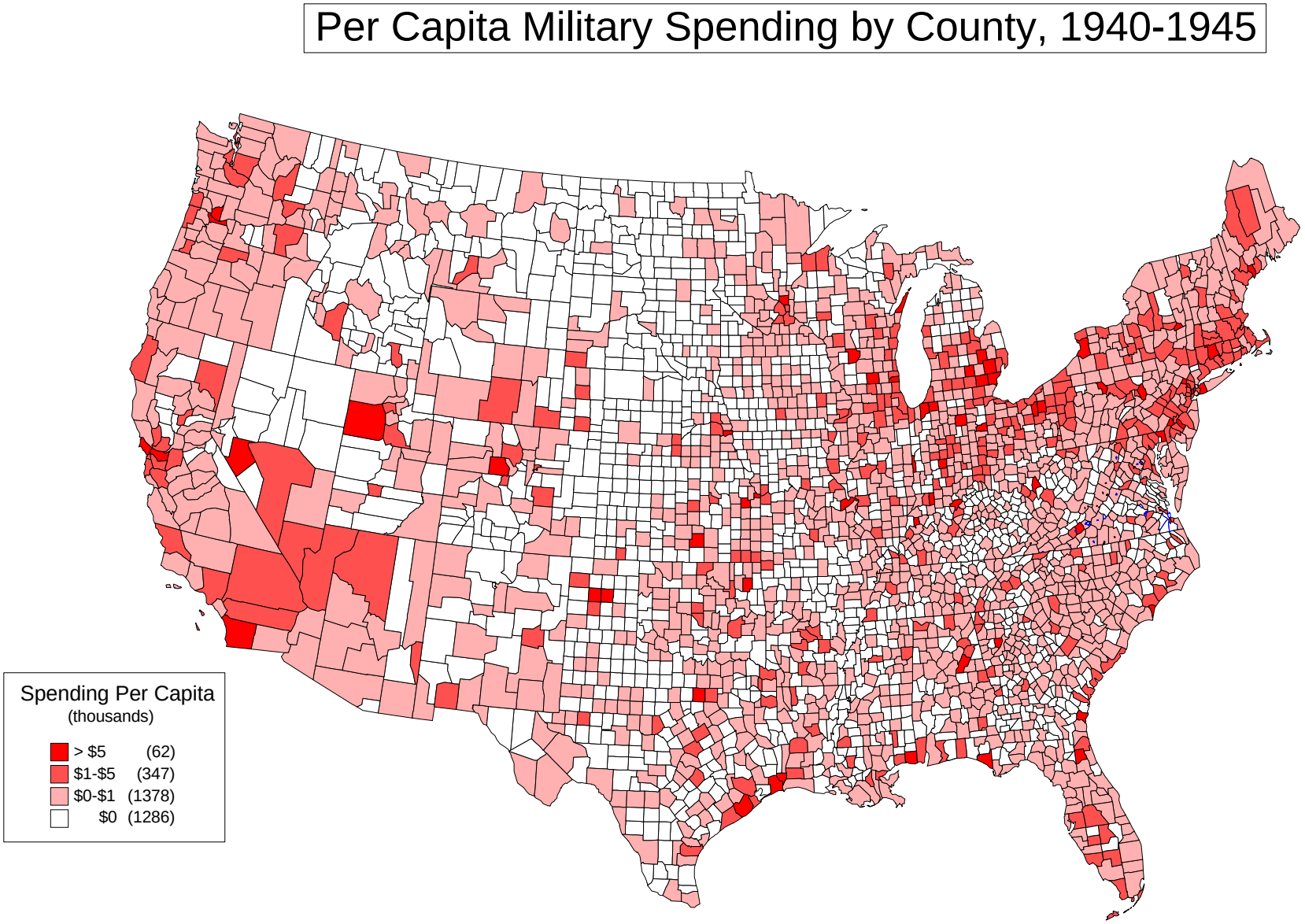
Per Capita Military Spending by County, 1940-1945
Spending Per Capita
(thousands)
> $5 (62)
$1-$5 (347)
$0-$1 (1378)
$0 (1286)

Figure 4