The Arsenal of Democracy: Production and Politics During WWII

Paul Rhode* James M. Snyder, Jr.† Koleman Strumpf‡

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Abstract

We study the geographic distribution of military supply contracts during World War II. This is a unique case, since over $3 trillion current day dollars was spent, and there were concerns that the country's future hinged on the war outcome. We find robust evidence consistent with the hypothesis that economic factors dominated the allocation of supply contracts, and that political factors—or at least winning the 1944 presidential election—were at best of secondary importance. General industrial capacity in 1939, as well as specialized industrial capacity for aircraft production, are strong predictors of contract spending across states. On the other hand, electoral college pivot probabilities are at best weak predictors of contract spending, and under the most plausible assumptions they are essentially unrelated to spending. This is true not only for total spending over the entire period 1940-1944, but also for shorter periods leading up to the election in November 1944. That is, we find no evidence of an electoral cycle in the distribution of funds.

Keywords: Distributive politics, government spending, presidential elections

JEL Classification:

*Department of Economics, University of Michigan
†Department of Government, Harvard University, and NBER
‡School of Business, University of Kansas

1 Introduction

During the Second World War, the federal government assumed an unprecedented degree of control over the U.S. economy. At the peak, the share of federal government expenditures in GNP soared to 44 percent, a level never attained before or since. (The level has not even exceeded 25 percent in the post-WWII era.) In addition to enrolling 16.4 million Americans—about one-eighth of the 1940 population—in the armed forces, the federal government spent $196 billion between 6/1940 and June 1945 on military supply contracts and $31 billion on investments in new production facilities. In 2014 dollars, this is equivalent to roughly $3.1 trillion. Surprisingly, although this war effort probably represented the largest single economic intervention by the federal government in U.S. history, the political economy of these spending flows has been subject to relatively little systematic, scholarly investigation.

This paper uses state-level economic and political data to investigate the relative importance of political and economic (strategic) factors in accounting for the geographic allocation of World War II -era military spending, both for major war supply contracts and for new facility projects. More specifically, we study the allocation of supply contracts and new facilities across all U.S. states during the period September 1940 through 10/1944.

Following an extensive empirical and theoretical literature on distributive politics in the U.S., we focus on one of the incumbent party's main goals—winning the next presidential election.[1] To measure the electoral importance of each state we employ a model similar to that in Strömberg (2008). Simulations based on this model yield estimates of the relative probability that each state would be pivotal in the electoral college in the 1944 presidential election. The model incorporates four key elements: (i) How close the average two-party vote in each state is to 50%; (ii) How variable the two-party vote is in each state; (iii) How many electoral votes the state has per-capita; and (iv) How correlated the two-party vote shares are across states.

To measure the economic/strategic importance of each state we use estimates of industrial capacity at the beginning of the war. States such as Connecticut, Michigan, New Jersey and Pennsylvania already had large factories producing automobiles, trucks, airplanes, ships, steel, and so on. These states also had a large stock of human capital ready to do work—many thousands of workers with many years of experience in factory work. Converting this

[1] See, e.g., Wright (1974), Wallis (1987, 1998, 2001), Brams and Davis (1974, 1982), Colantoni, Levesque and Ordeshook (1975), Nagler and Leighley (1992), Shaw (2006), Shor (2006), Strömberg (2008), Hudak (2014).

physical and human capital to wartime production was generally much cheaper than building factories from scratch. Perhaps even more importantly, conversion was typically the fastest way to get production up and running, which was crucial for the war effort. The temporal pattern of spending in per capita terms is shown in Figure 1, while Figure 2 shows the allocation across states by year.

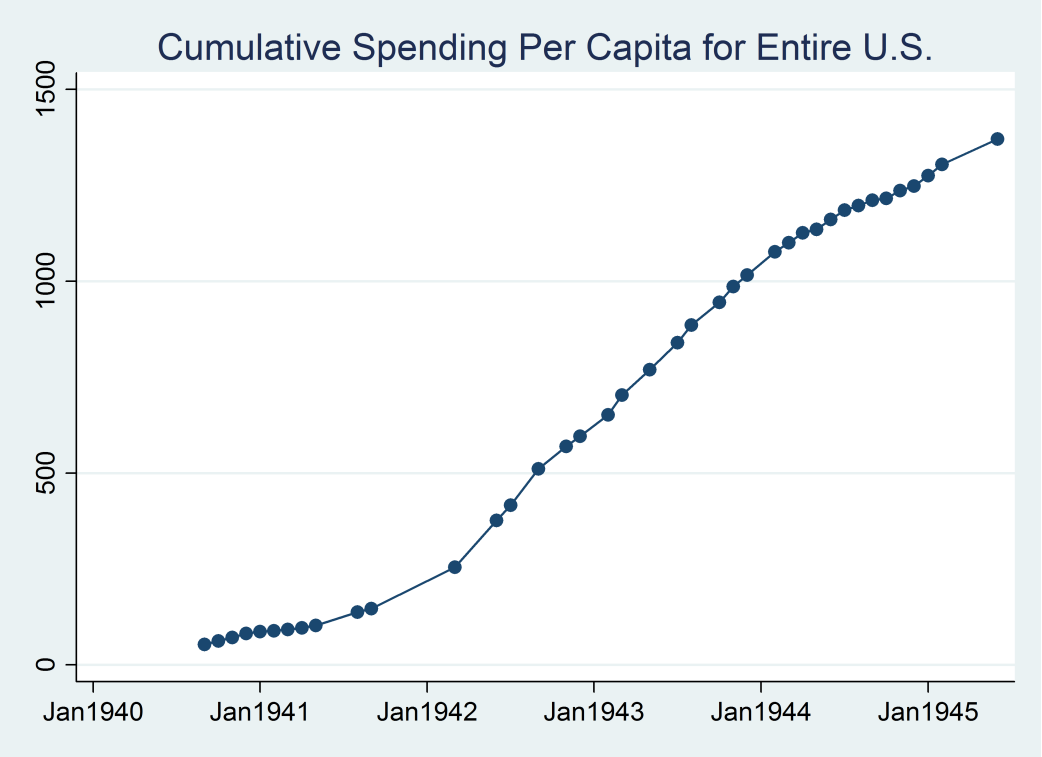


Figure 1: Cumulative Contract Spending Per Capita, 1940–1945

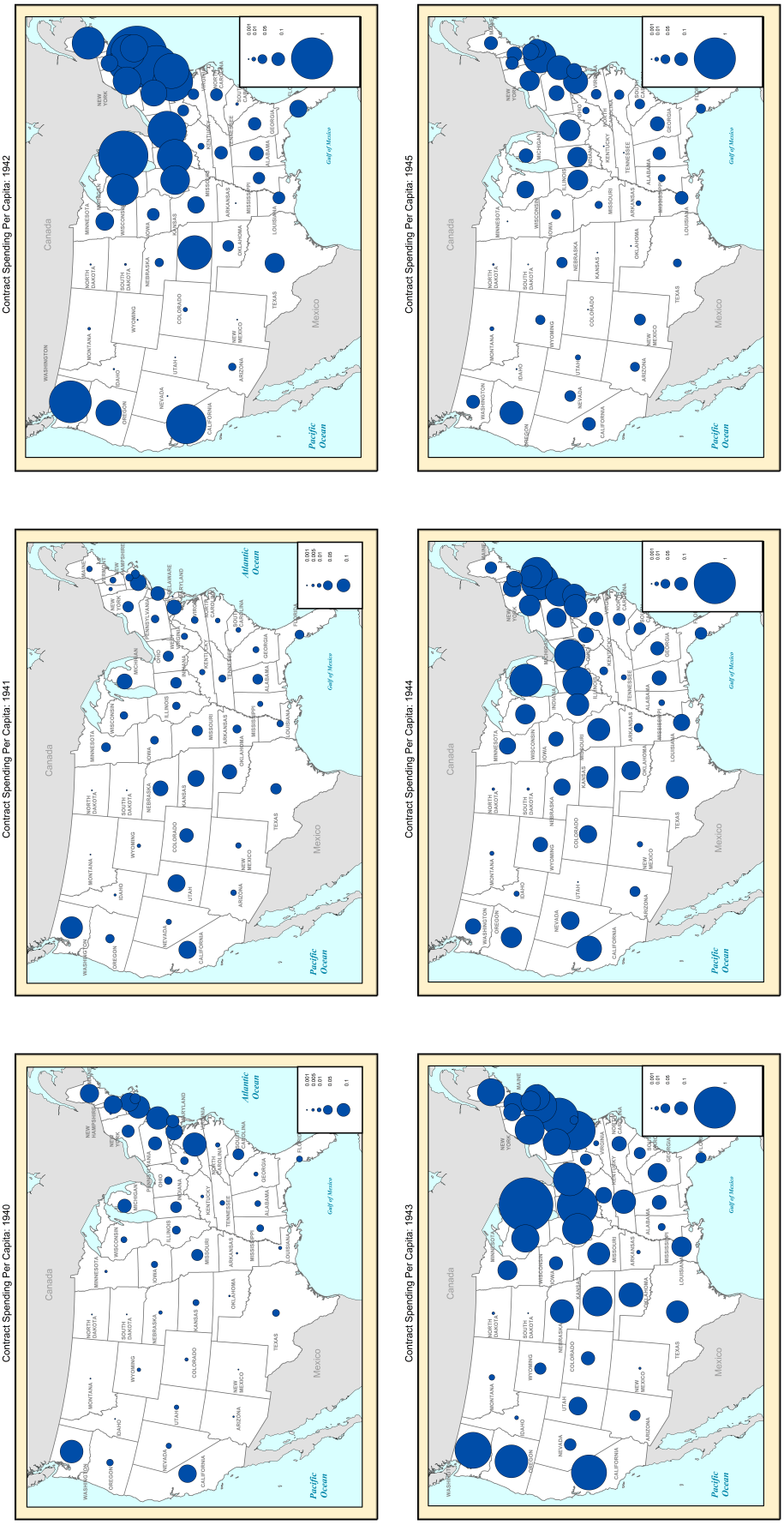


Figure 2: Annual Contract Spending: By State

Our findings are easily summarized. We find robust evidence consistent with the hypothesis that economic factors strongly influenced the allocation of supply contracts, and that political factors—or at least winning the 1944 presidential election—were at best of secondary importance. General industrial capacity in 1939, as well as specialized industrial capacity for aircraft production, are strong predictors of contract spending across states. On the other hand, electoral college pivot probabilities are at best weak predictors of contract spending, and under the most plausible assumptions they are essentially unrelated to spending (as discussed below, a key free parameter is how responsive votes are to spending, and we use values based on estimates which which relate voting preferences in Gallup polls to both World War II and New Deal spending). This is true not only for total spending over the entire period 1940-1944, but also for shorter periods leading up to the election in November 1944. Thus, in addition to finding no overall effect of pivot probabilities, we also find no evidence of an electoral cycle in the distribution of funds.

It is possible, of course, that pragmatic concerns related to winning the war dominated narrow distributional concerns because the enormous stakes involved. As Churchill famously argued as the Battle of Britain began, "Upon this battle depends the survival of Christian civilization... If we fail, then the whole world, including the United States, including all that we have known and cared for, will sink into the abyss of a new Dark Age." It might not be surprising, therefore, to find the U.S. government acting as if it placed an extremely high value on social welfare—the "public good" of defeating Germany and Japan.

It is also possible that pragmatic concerns related to winning the war dominated narrow distributional concerns for electoral reasons. A number of political economy models incorporate both public goods and distributive goods.[2] One (unsurprising) result in these papers is that elected officials will provide public goods rather than distributive goods if the public goods are valued enough by voters relative to the distributive goods. In these circumstances, it is difficult to distinguish a concern for social welfare from a concern for votes.[3]

We find evidence consistent with this hypothesis in survey data. For example, as the war proceeded and it became clearer that the allies were winning—especially after D-Day in June 1944—respondents became more confident that the war was more likely to end quickly if the Democrats remained in power than if the Republicans held power.

[2]See, e.g., Leblanc, Snyder and Tripathi (2000), Lizzeri and Persico (2005), Battaglini and Coate (2008), Volden and Wiseman (2007), and Cardona and Rubí-Barceló (2013).

[3]See also Becker (1983), which predicts that under "pluralism," in which a large number of interest groups compete for influence, we should also expect relatively outcomes.

At a minimum, our evidence suggests that model that focus exclusively on "tactical distributional politics"—e.g., Lindbeck and Weibull (1987), Dixit and Londregan (1995, 1996), McCarty (2000), Strömberg (2008), Primo and Snyder (2008)—might be useful in predicting government behavior in times of national crisis.

2 Background

During the Second World War, the federal government assumed an unprecedented degree of control over the US economy. The federal government spent $196 billion between 6/1940 and June 1945 on military supply contracts and $31 billion on investments in new facilities. Relative to the 1940 total population, per capita spending over this five-year period averaged $1,813 in current dollars or almost $24,800 in 2014 purchasing power. In real annual per capita terms, domestic procurement spending during World War II was about than four-and-one-half times higher than the New Deal era spending which has attracted so much scholarly attention.

In the interwar period, the US government spent only 1-2 percent of GDP on the military. Most money for supplies and arms was allocated according to rigidly specified competitive procedures. Procurement officers would advertise for clearly defined quantities and qualities for a specific item, invited bids, and award the contract to the lowest qualified bidder. The federal government also imposed profit limits on aircraft and shipbuilding contracts under the 1934 Vinson-Trammel and 1936 Merchant Marine Acts.

The outbreak of full-scale war in September 1939 led to dramatic changes in "business as usual." Table 1 offers a condensed timeline of the evolution of government agencies in charge of procurement and industrial mobilization over the 1939-45 period. The expediting acts of June 28 and July 2, 1940, 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. In October 1940, the federal government also eliminated profit ceilings on defense contracts, using excess-profit taxes in their place. A series of civilian-run bureaucracies were created to facilitate the war production effort.

In May 1940, Roosevelt used his war powers to establish Advisory Commission of the Council for National Defense (NDAC). The NDAC begat the Office of Production Management (OPM) which begat the War Production Board (WPB) which begat the Civilian

Table 1: **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 Aug	War Resources Board formed "to assist Army and Navy Munitions Board with plans for industrial mobilization."
1 Sept	Germany invades Poland.
24 Nov	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 Aug	Reconstruction Finance Corporation forms Defense Plant Corporation.
29 Dec	Roosevelt's "Arsenal for Democracy" speech.
1941	
7 Jan	Office of Production Management established to replace NDAC.
1 Mar	Senate creates "Truman Committee" to investigate defense program.
11 Mar	Lend-Lease Act approved.
17 Mar	OPM Plant Site Committee (later Board) established.
28 Aug	Supply Priorities and Allocation Board formed with power over OPM.
3 Dec	Production Requirements plan introduced.
7 Dec	Pearl Harbor attacked; US enters War.
1942	
16 Jan	War Production Board formed to replace SPAB.
18 Apr	War Manpower Commission established.
28 Apr	Office of Price Administration "freezes prices."
9 June	Smaller War Plants Corporation established.
10 Oct	WPB directs procurement agencies to avoid "Critical Labor Areas."
2 Nov	Controlled Materials Program announced.
1943	
27 May	Office of War Mobilization established to "harmonize government activities."
5 Nov	Truman Committee Report issued.
30 Nov	WPB announces reconversion policy.
1944	
3 Oct	Office of War Mobilization and Reconversion established to replace OWM.
1945	
8 May	V-E Day.
2 Sept	Formal V-J Day.
4 Oct	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)

Production Administration (CPA). 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 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 contracting note that the spending process, especially plant location decisions, induced a torrent of lobbying from 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."

Placement authorities responded to such 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 even earlier. 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 (U.S. 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).

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

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). 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.

Politics or peacetime objectives played crucial roles in some decisions. 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, pp. 102-04). Although the performance of southern shipbuilders remained below eastern levels in the early 1940s, the Commission followed the administrations 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 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.

3 Data and Summary Statistics

The state-level monthly (approx.) military spending variables– contract and facilities spending– are from various economic reports published by the National Industrial Conference Board, hearings of the U.S. House Select Committee Investigating National Defense Migration, and the U.S. War Production Board, Statistics of War Production. See the data appendix for details.

The manufacturing employment variables, including the number of wage-earners in total, in aircraft (SIC 372) and shipbuilding (SIC 373) in 1939 are from US Bureau of the Census, Census of Manufactures: 1947, Vo. 3, Area Statistics (Washington, DC: GPO, 1950).

The state-level data on elections for U.S. president, U.S. senator, and state governor are from ICPSR study number 2 (Candidate Name and Constituency Totals, 1788-1990).

Figures 3a and 3b show the distribution of two of the dependent variables we study—contract spending per-capita for the entire war up to November 1944 (i.e. 6/1940 through 10/1944), and contract spending per-capita from January to November of 1944 only. The maps show that many states in the northeast and industrial midwest—Connecticut, Rhode Island, Delaware, New Jersey, Michigan, Indiana and Ohio—received much more in contract spending per capita than the average state. The three states bordering the Pacific also fared quite well in terms of contracts. However, the map also shows that some states less associated with the industrial heartland—e.g., Kansas, Missouri, Nebraska, Oklahoma, and Texas, also received more in contract spending that the average state.

Figures 3c and 3d show the distribution of the other key independent variables—total manufacturing employment per-capita and aircraft manufacturing employment per-capita—across the U.S. states. Three features stand out. First, overall manufacturing employment was distributed relatively uniformly compared to the other variables (hence no large dots).

Second, it is nonetheless clear that total manufacturing employment per-capita was a bit larger in northeast and industrial midwest than in other regions. There are a few exceptions, such as North and South Carolina, Georgia, and Virginia, which had substantial numbers of manufacturing employees. Third, aircraft manufacturing employment was highly concentrated in a few states.

Table 2 presents key summary statistics — mean, median, standard deviation. One important point is that the dependent variables of interest are not massively skewed. The next section discusses the voting data presented in the bottom panels.

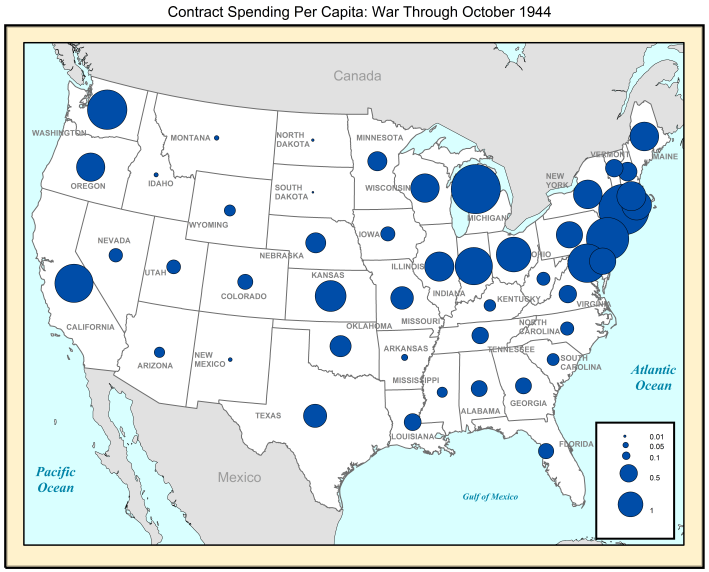
Table 2: **Summary Statistics**

	N	Mean	Std. Dev.	Min	Max
Manufacturing Employment					
All Manufacturing PC	48	49.5681	36.288	4.0576	148.7924
Air Manufacturing PC	48	0.3125	0.859	0	4.2680
Shipping Manufacturing PC	48	0.4926	0.901	0	3.1464
Spending (thousand $)					
1942 Spending PC	48	0.4674	0.560	0	2.6477
1943 Spending PC	48	0.3205	0.333	0	1.6954
1944 Spending PC	48	0.1998	0.183	0	0.8133
1945 Spending PC	48	0.0996	0.127	0	0.6125
Spending PC (Through Oct 1944)	48	0.9640	0.988	0.0062	4.1141
Spending PC (Jan-Oct 1944)	48	0.1761	0.169	0	0.7905
Spending PC (Sep-Oct 1944)	48	0.0172	0.021	0	0.0787
Spending PC (Aug-Oct 1944)	48	0.0188	0.062	0	0.1017
Spending PC (Jul-Oct 1944)	48	0.0490	0.058	0	0.1952
Spending PC (Jun-Oct 1944)	48	0.0714	0.071	0	0.2545

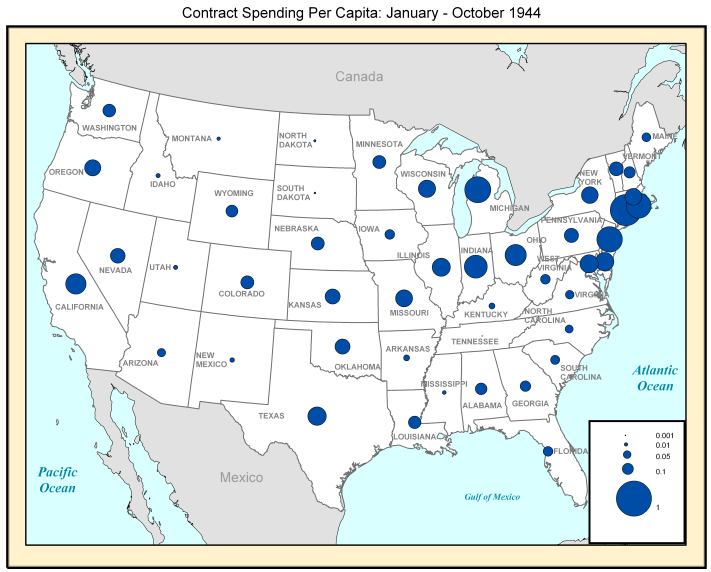
Spending Variables (thousand $)	N	Mean	Std. Dev.	Min	Max
Full sample					
Cumulative Spending PC	39566	0.8263	0.806	0	4.1913
Spending PC	39486	0.0986	0.106	0	0.6707
Vote Intention data available (1942-44)					
Cumulative Spending PC	27318	1.0561	0.835	0	4.1913
Spending PC	27266	0.1011	0.103	0	0.6707
Vote Approval data available (1941-43)					
Cumulative Spending PC	12223	0.0778	0.112	0	0.5828
Spending PC	12248	0.3138	0.405	0	2.7332

Voting variables	N	-2	-1	0	1	2
Vote Intentions (1942-44)						
V	24456			45.2%	54.8%	
$\triangle V$(2 *point scale*)	20042		10.2%	84.4%	5.4%	
$\triangle V$(4 *point scale*)	27090	7.6%	9.3%	66.8%	12.4%	4.0%
Vote Approval (1941-43)						
V	19108			21.0%	79.0%	
$\triangle V$(2 *point scale*)	15689		3.2%	74.6%	22.2%	
$\triangle V$(4 *point scale*)	21001	2.4%	4.4%	58.6%	18.0%	16.6%

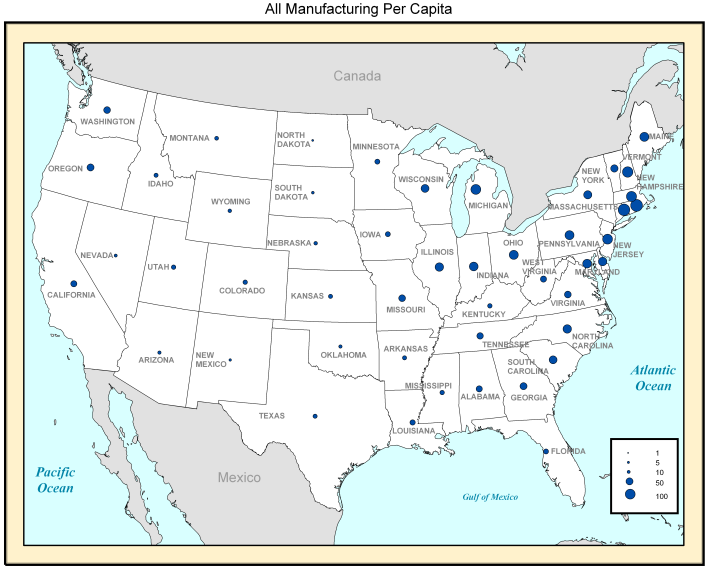
The top panel are state-level summaries. The bottom two panels are for helping interpret the regressions of votes on spending (discussed in Section 4). Spending panel: these are statistics based on matching spending to Gallup Poll respondents, so larger states will receive more weight. The bottom rows present values conditional on the availability of the listed voting variable. Voting panel: $V = 1$ means intend to vote/approve FDR, $V = 0$ means intend to vote against/not approve FDR (there are also respondents who have no preference). $\triangle V$(2 *point scale*) and $\triangle V$(4 *point scale*) are defined in Section 4, and they reflect how intentions/approval of FDR differ relative to how the poll respondent voted in 1940 (the more positive the values, the more the voter is changing their vote in favor of FDR). The Data Appendix lists the specific Polls which are used.



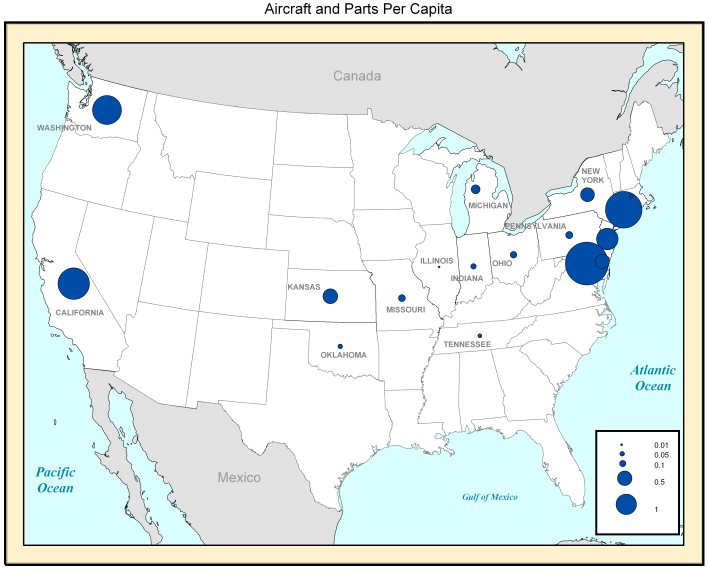
(a) Per Capita Contract Spending, 6/1940 through 10/1944



(b) Per Capita Contract Spending, 1/1944 through 10/1944



(c) Total Manufacturing Employment Per Capita, 1939



(d) Aircraft Manufacturing Employment Per Capita, 1939

Figure 3

4 Spending and Votes: Gallup

4.1 Background

A central issue for the pivot probability calculation discussed in the next section is the responsiveness of votes to spending. The more elastic are votes, the more attractive it will be to allocate funds for political gain. We will consider specifications of the form

$$V_{ist} = \beta S_{st} + \epsilon_{ist} \tag{1}$$

where i is an individual voter living in state s at time t, V is a measure of voting, and S is a measure of spending (we will also consider various additional controls discussed below). We are primarily interested in the estimated parameter β.

Estimating this effect is challenging for several reasons. First a suitable measure of voting with geographic granularity is needed. Second we need to deal with the potential endogeneity of the observed spending allocation, namely that it might be targeted to areas which have voters of certain characteristics or at times when voters are especially responsive. For example, if spending is targeted to areas which have more responsive voters, then regressing votes on spending will yield estimates which overstate the average responsiveness of votes. Finally, what actually matters for the allocation decision is politician expectations of the responsiveness, which might differ from the actual ex post measure.

We can deal with each of these issues to some degree. For the voting data we use Gallup Polls archived at the Roper Center for Public Opinion Research (see Data Appendix for full list of studies, sample sizes, and field survey dates). Gallup was among the first to conduct scientific polling of representative samples of likely voters, who were asked about vote intentions, vote preferences, retrospective voting, demographics, state of residence and other questions such as opinions about the war. The first Gallup poll available at Roper is from 1936, and new polls of roughly 3,000 respondents were conducted roughly every two weeks (though the same questions are not asked in all polls, and in particular vote questions are often omitted). Gallup data is non-panel, with new respondents in each wave. This means we cannot use actual voting and at the same time exploit the rich time variation in spending discussed earlier. Instead we use various measures of vote intentions or candidate approval and see how these are influenced by contemporaneous spending. To do this we match the Gallup polls to various spending programs at the state-date level (1941–1944 for war spending, and earlier polls for other spending discussed below).

The second issue of spending endogeneity is more difficult. Contracts might be allocated based on some characteristic, such as individual-level demographics or local economic conditions like unemployment which in turn are related to how people vote, or at times when individuals are deciding how they will vote, say right before the election. That is spending is not random but may be targeted to places or times when it is most effective at changing votes. We can partly address this by taking differences and including state fixed effects, both of which will account for time invariant heterogeneity, as well as including time fixed effects, which accounts for temporal targeting in spending. That is we consider an alternative to (1),

$$\Delta V_{ist} = \beta \Delta S_{st} + \nu_s + \omega_t + \epsilon'_{ist} \tag{2}$$

Here $\Delta V_{ist} \equiv V_{ist} - V_{is0}$ where the latter term represents the actual vote in the last presidential election (recall the vote data is from a non-panel source so vote preference is unobserved, but Gallup does ask about retrospective voting), ΔS_{st} is the level of spending in the state in period t (non-differenced spending is the cumulative spending), and ν_s and ω_t are fixed effects. This specification exploits the fact that we have many different Gallup polls at different times. Thus, for example, we can compare voters who live in the same state, one who is interviewed *before* a large inflow of spending in the state and one who is interviewed *after* the spending has occurred.

There remains the possibility that voter responsiveness to spending varies over time, and that politicians understand this and target spending to areas with more malleable voters at times when they area more responsive to spending. This would seem to require that politicians have a large amount of fine-grained information, but it is still possible. If so, our difference-in-differences specification will likely overstate the effectiveness of spending. We therefore view our estimates as an upper-bound of the true effect.[4]

We consider two versions of the differenced vote variable.[5]

On the final issue, while it is not possible to literally measure politician expectations

[4]Spending could also be allocated for other political goals. For example it could be targeted to areas with loyal voters, and this would have an ambiguous bias (while loyal voters are less likely to change their votes, the money could induce turnout and this approach would motivate relatively few loyalists of the other party).

[5]This is done since it is unclear how to deal with non-voters in the previous period. In one scale, we omit previous non-voters and $\Delta V_{ist} \in \{-1, 0, +1\}$ with -1 indicating a previous Democrat voter who now votes Republican, +1 a previous Republican voter who now votes Democrat, and 0 someone who does not change their vote. In the second scale we include the previous non-voters, and $\Delta V_{ist} \in \{-2, -1, 0, +1, +2\}$ where -2 is a previous Democrat voter who now votes Republican, -1 is a previous non-voter who now votes Republican, 0 is a voter who does the same as in the last elections, etc.

we instead consider multiple spending programs. In addition to the World War II military spending, we also consider New Deal spending. New Deal spending is helpful since it is also quite large, sustained over several years, and occurs shortly before the War and so politicians are likely familiar with its magnitude and its resulting impact on voting patterns (here we use polls over the period 1936-40). The New Deal spending data is from Price Fishback [cite here].

4.2 Estimates

In this section we present estimates of the main specification (2). Most of the results focus on World War II contract spending over the period 1941-1944, and consider its relation to the evolution of voter preferences for the 1944 presidential election between FDR and Dewey. Table 2 contains the summary statistics from the Gallup file as well as the associated spending variables.

Table 3 presents the main estimates of Equation (2) which focuses on WW II contract spending per capita. We use the voter's stated vote in the 1940 presidential election for V_{is0}. Gallup asks different vote-type questions and so there are two separate sets of results, one based on voter approval of FDR (available in 1941-1943) and a second based on a voter's intended vote in the 1944 election (available in 1942-1944). In the top panel which presents results for voter approval, the first two columns focus on cumulative spending. A one thousand dollar per capita increase in cumulative contract spending (equivalent to over $100 billion in spending and a bit more than either the mean or standard deviation for this variable) lead to a 0.08 shift in votes to the Democrats on the two point scale (which omits previous non-voters and ranges from -1 to 1) and 0.15 on the four point scale (which ranges from -2 to 2). Under a simple model of preference distribution this would correspond to a 4 percentage point increase in FDR's percent vote in a state, a non-trivial amount but relatively modest considering the magnitude of funds involved (and again recall this is an upper bound effect, and the second value is not statistically significant).[6] The estimates in

[6]Consider first the two point scale which ignores non-voters. Suppose voter have ideal points, x, which are uniformly distributed along the unit interval, and that they vote for the Democrats if $x < X$ where X is a cut-point that accounts for non-policy valence ($X = 0.5$ if the candidates are equally attractive for non-policy reasons). The estimates suggests spending shifts each ideal point to the left by 0.04 after taking into the scaling of the dependent variable, and will change aggregate FDR vote by the same amount. With the four point scale, suppose that individuals only vote if they have strong preference between the candidates so voters with $X_1 < x < X_2$ abstain where the X_i are the cut point for voting for the Democrat or Republican. The same reasoning for the two point scale and recalling the larger scale here implies that spending again

the next two columns shows a $250 per capita increase in annual contract spending (again about $100 billion over the all years, and twice the mean or standard deviation) leads to a shift in voters to the Democrats that is only about half as large.

The bottom panel of Table 3 repeats this using vote intentions as the dependent variable. Here there are no positive and significant results, and some of the values are even negative. In all cases the economic effects are much smaller, suggesting a very limited voter response to war spending.

Table 3: **WW II Contract Spending: Change in Vote Intention or FDR Approval, equation (2)**

	Dep Var = Change in FDR Approval			
	Two-point	Four-point	Two-point	Four-point
Cumulative Spending PC	0.0813	0.1497		
	(0.036)	(0.073)		
Spending PC			0.2079	0.3275
			(0.113)	(0.245)
Time Period	1941–1943	1941–1943	1941–1943	1941–1943
N	9053	12158	9036	12133
R^2	0.01	0.01	0.01	0.01
	Dep Var = Change in FDR Vote Intention			
	Two-point	Four-point	Two-point	Four-point
Cumulative Spending PC	-0.0458	-0.0754		
	(0.013)	(0.028)		
Spending PC			0.0339	0.0977
			(0.059)	(0.122)
Time Period	1942–44	1942–44	1942–44	1942–44
N	20036	27082	19992	27031
R^2	0.00	0.00	0.01	0.01

Robust standard errors in parentheses. State fixed-effects and year fixed-effects included in all specifications. Data are roughly at quarterly frequency and are at the person-state-time period level. Cumulative Spending includes all contract spending from the start of the war through the current period, and Spending includes spending in that period only (e.g. the per-period difference in Cumulative Spending); both are in per capita terms. Vote-Approval and Vote-Intention are for individual respondents and come from Gallup Polls. In the two-point scale the dependent variable $\triangle V \in \{-1, 0, 1\}$ and under the four-point scale the dependent variable $\triangle V \in \{-2, -1, 0, 1, 2\}$ (see Section 4.1). The Data Appendix lists the specific Polls which are used.

will increase FDR's vote share by 0.04.

As a robustness check we considered various modifications of these specifications (and all two-way permutations of these modifications), and in all cases we continue to find small economic effects. These include looking at spending in level rather than per capita terms, using industrial or military spending, using non-differenced voting rather than netting our previous vote patterns (and estimate using either a linear probability model or a logit), omitting various combinations of fixed effects, including both cumulative and annual spending to allow for diminishing returns (voters respond primarily to the first increment of spending), and interacting spending with individual-level demographics such as age, race, religion, parent's country of origin, urban location, occupation, education, and phone- or car-ownership (wealth proxies). The latter is especially important since it is a more direct control for geographic-targeting of funds based on local characteristics.

Table 4 examines New Deal spending over 1936-1940, which might reflect information politicians had when they started allocating the war spending monies. We repeat the specifications and approach from the previous table. We use the voter's stated vote in the 1936 presidential election for V_{is0}, except the very first poll which occurs before that election and so the vote in 1932 is used there. Except in one case the parameters are not statistically different from zero, though the standard errors are modest as the sample size is relatively large. We begin again with voter approval (unlike with the war polls, the voting variables are evenly spread across the sample period). Using the point estimates and the same model from the last paragraph, a two hundred and fifty dollar increase in annual spending per capita increases FDR's vote share by three and a half to five and a half percent. This is quite close to the values from war spending. Cumulative spending per capita has a negative association, with a thousand dollar increase associated with about a one to four percent reduction in FDR votes. If instead vote intentions are used, the estimates in the final four columns indicate the effect on FDR votes is about twice as large for annual spending and about the same (negative) effect for cumulative spending. Echoing the earlier results, there is little evidence that spending yields large positive shifts in voting, and again the estimates here are likely upper bound effects.

Overall, there is little support from either the World War II spending or New Deal spending that votes are especially responsive to government resource allocations. It suggests that politically strategic allocation of war monies is unlikely to be successful at shaping electoral outcomes. Still this is just one input in the allocation calculus, and we return to

Table 4: **New Deal Spending: Change in Vote Intention or FDR Approval, equation (2)**

	Dep Var = Change in FDR Approval			
	Two-point	Four-point	Two-point	Four-point
Cumulative Spending PC	-0.0436	-0.1748		
	(0.060)	(0.124)		
Spending PC			0.2731	0.9278
			(0.258)	(0.602)
Time Period	1936–1940	1936–1940	1936–1940	1936–1940
N	19209	27031	19209	27031
R^2	0.02	0.02	0.01	0.01
	Dep Var = Change in FDR Vote Intention			
	Two-point	Four-point	Two-point	Four-point
Cumulative Spending PC	-0.0987	-0.1899		
	(0.064)	(0.111)		
Spending PC			0.9424	0.9155
			(0.292)	(0.586)
Time Period	1937–1940	1937–1940	1937–1940	1937–1940
N	13170	17789	13170	17789
R^2	0.05	0.04	0.03	0.03

Robust standard errors in parentheses. State fixed-effects and year fixed-effects included in all specifications. Data are roughly at quarterly frequency and are at the person-state-time period level. Cumulative Spending includes all contract spending from the start of the war through the current period, and Spending includes spending in that period only (e.g. the per-period difference in Cumulative Spending); both are in per capita terms. Vote-Approval and Vote-Intention are for individual respondents and come from Gallup Polls. In the two-point scale the dependent variable $\triangle V \in \{-1, 0, 1\}$ and under the four-point scale the dependent variable $\triangle V \in \{-2, -1, 0, 1, 2\}$ (see Section 4.1). The Data Appendix lists the specific Polls which are used.

the importance of politics in the allocation process in the next section.

5 Calculating Pivot Probabilities

Our procedure for estimating the political value, or "pivot probability" of each state in the 1944 presidential election, is similar in spirit to that in Strömberg (2008). The goal is to answer the following question: For each state i, how likely is it that a marginal change in supply contract spending state i (either up or down) would change the electoral college outcome? Note that we focus on the incumbent party's allocation decision. This is because it is not clear what assumptions to make regarding voters' beliefs about what the challenging Republican party would do in power. The Republicans had not held power nationally for more than a decade, and had no previous record governing during a crisis similar to WWII since the Civil War.

First, for each state we calculate the Democratic share of the two party vote in all elections for U.S. president, U.S. senator, and state governor that took place between 1932 and 1943.[7] Denote this by D_{ijt}, where i indexes states, j indexes offices, and t indexes years. Next we estimate the following model, using OLS:

$$D_{ijt} = \alpha_i + \theta_t + \epsilon_{ijt} \tag{3}$$

where α_i denotes a vector of state-specific fixed-effects and θ_t denotes a vector of year-specific fixed-effects. This yields the "normal Democratic vote" in state i ($\hat{\alpha}_i$), and the "idiosyncratic electoral variability" in state i (standard deviation of the residuals for state i). Call these D_i^{mean} and D_i^{sd}, respectively. Also, let E_i be the number of votes state i has in the electoral college, and let P_i be state i's population.

The next step is to calculate how spending would change vote outcomes, and in turn whether these changes would alter the election outcome compared to the no spending case. We must make an assumption about two parameters. The first is the expected national electoral shock or "national tide" in the 1944, which we denote D^N (positive values being in favor of Democrats and negative values being against).[8]

[7] We drop cases in which a third party candidate received more than 15% of the total vote. We also drop cases where the Democratic share of the total vote was less than 5% or greater than 95%. We also ran the analysis dropping the elections held in 1942 and 1943, and the results are quite similar to those presented below.

[8] This is akin to the fixed effect θ_t from the estimates of (3), but those values cannot be used because they are for earlier periods.

The second is the effect of military spending on the share of votes won by the Democrats in 1944. As noted above, the standard deviation of contract spending per-capita was about \$1,000, and the average was also about \$1,000. The average state population was about 2.7 million. So, we consider changing a state's total contract spending by \$2.7 billion. How does that translate into votes? This depends on voter behavior—how sensitive voters are to spending in their state when deciding how to vote—which we denote V^m (In order to avoid parameter values with many decimals, we measure contract spending in thousands of dollars).[9]

For each choice of these parameters—discussed shortly—we simulate 10 million elections, as follows:

(i) Draw an idiosyncratic shock η_i for each state i from a distribution that is $N(0, D_i^{sd})$.

(ii) Let $V_i = D_i^{mean} + D^N + \eta_i$ be the Democratic vote share in each state i.

(iii) Calculate the electoral college winner given the vector of V_i's (there were 531 members of the electoral college in 1944):

$$\textit{Democratic Win} \quad \text{if} \quad \sum_{\{i|V_i>.5\}} E_i > 265$$
$$\textit{Republican Win} \quad \text{if} \quad \sum_{\{i|V_i>.5\}} E_i < 265$$

(iv) In the case of a *Republican Win*, loop through the set of states with $V_i < .5$ (the states won by Republicans) one state at time, and add $V^m \times (2700000/P_i)$ to V_i while holding all other states' voting outcomes fixed. If doing this changes the electoral college outcome to a Democratic win, then call state i *Pivotal*.[10]

In the case of a *Democratic Win*, loop through the set of states with $V_i > .5$ (the states won by Democrats) one state at time, and subtract $V^m \times (2700000/P_i)$ from V_i

[9]Note that V^M takes on two roles: it measures both vote sensitivity to money and the amount of spending. That is, doubling its value could mean the amount of spending doubles and vote sensitivity stays constant. For our purposes focusing on vote sensitivity is reasonable since we have calibrated the spending level to match the actual amount during the war.

[10]Note that for state i to be pivotal, two changes must occur. First, $V_i + V^m \times (2700000/P_i)$ must greater than .5 (the injection of funds must change the outcome in state i from a Republican majority to a Democratic majority). Second, state i must have enough electoral college votes so that changing the state from Republican to Democratic changes the outcome in the electoral college. The first change will tend to happen more often in small states, but the second change will tend to happen more often in large states.

while holding all other states' voting outcomes fixed. If doing this changes the electoral college outcome to a Republican win, then call state i *Pivotal*.

(v) Let *Pivot Probability*$_i$ be the fraction of times that state i is *Pivotal* out of the 10 million simulated elections.

Choosing a range of values for the national tide, D^N, is relatively straightforward. The median presidential vote swing over the period 1920-1944 was about 3%, and historically swings larger than 5% are relatively rare. To keep things simple we consider three values, D^N = -.03, 0, and .03.

Choosing a range of values for V^m is trickier. It should represent the impact of the overall size of War spending on the Democratic vote share. Our best benchmarks are from the World War Two and New Deal spending estimates in Section 4. Recall that we consider two versions of spending (cumulative and per year) as well as four versions of vote change (omitting and including previous non-voters, and vote intention versus vote approval). As discussed in that section, in each case we can convert the parameter values into the change in Democratic vote share from total war spending.[11] For the World War Two spending (Table 3) the average imputed V^M value is 0.012 with a maximum of 0.041. For New Deal spending (Table 4) the average is 0.013 and the maximum is 0.118. In addition, when V^m = .0621801, the average vote shift caused by military spending is equal to the average (across states) of the within-state standard deviation of vote share across years and offices. We examine a range of possible V^M, but we think the most plausible value is around 0.05 or 0.06 (since some of the underlying parameter estimates are negative).

We consider $V^m \in \{.03, .06, .09, .12, .15, .18, .21, .24, .27, .30\}$. We include the high values in our analyses to show what the model would predict if politicians believed that military spending was highly effective at winning votes.

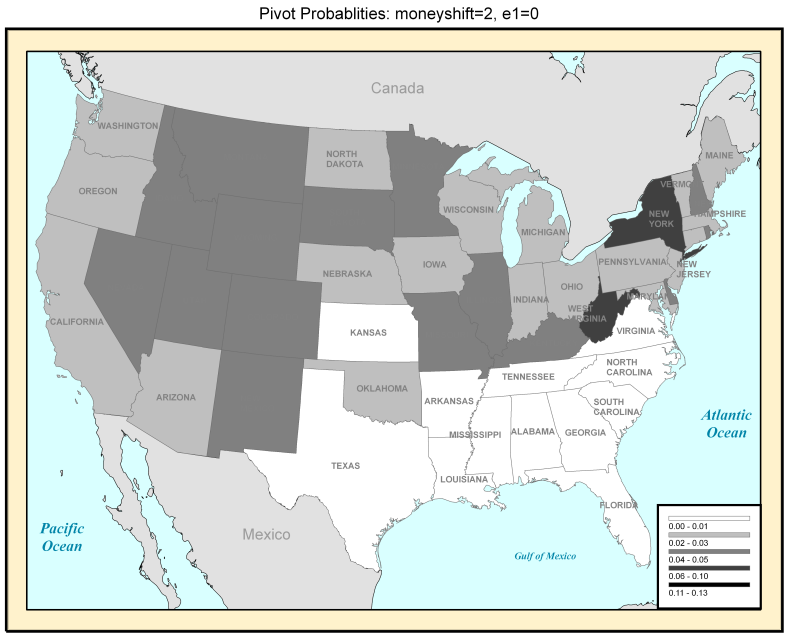
We ran 30 separate simulations, one for each combination of D^N ($\times 3$) and V^m ($\times 10$).

[11] The spending parameters, like V^M, are denominated in thousands of dollars per capita. The parameter then must be divided by certain factors depending on the combination of spending and vote variable being used. For cumulative spending roughly a thousand dollars matches the overall war total ($F_1 = 1$) while for per year spending the amount is two hundred and fifty dollars ($F_1 = 4$). For the vote scale the values should be mapped into the unit interval to give vote shares which can be applied to the two-point ($F_2 = 2$) and four-point ($F_2 = 4$) scales. Finally, to convert to expected voting we use a common factor for vote intentions and vote approval ($F_3 = 1$). The vote approval factor in principle could differ (since it is not literally how an individual plans to vote), but using data from OPOR surveys and regressing vote intention on vote approval shows that for the observed range of approval values that little adjustment is needed (regression available upon request). So to map the parameter estimate into a fitted V^M value we take $\hat{\beta}/(F_1 \times F_2 \times F_3)$.

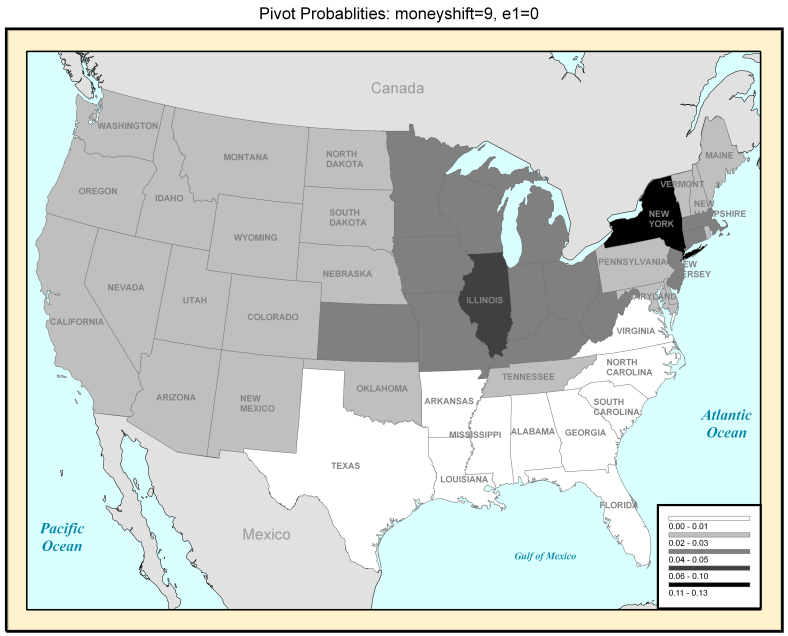
Figures 4a and 4b show how the pivot probabilities vary across states, for two values of V^m—.09 (a "reasonable" value), and .27 (probably implausibly large).

The graphs suggest that the pivotal probabilities are plausible, and also that they provide value added over other approaches. While the probabilities vary with V^m and D^N, the ordering of the states is relatively stable. States with high pivot probabilities—such as New York, Illinois, and Missouri—are those which are not strongly aligned with one party, while those with pivot probabilities of zero—South Carolina, Mississippi, Louisiana, Georgia, Alabama—tilt heavily towards Democrats. In fact, the states of the solid south are essentially never pivotal. The results also differ from simpler and more naive approaches. For example one could see which states have the most volatile historical votes. This would be an unsatisfactory measure since it ignores both the the baseline partisanship of the state and the state's size. In fact historical volatility has little correlation with any of the state-level pivotal probability measures (results available upon request).[12]

[12]Volatility is the residual standard error from (3).



(a) Pivot Probabilities for $V^m = .06$, Neutral Tide



(b) Pivot Probabilities for $V^m = .27$, Neutral Tide

Figure 4

6 Results

This section presents the main estimates explaining the spatial distribution of spending across states. The focus is on determining the relative contributions of political and economic efficiency mechanisms. We begin with a short motivational approach which gives preliminary evidence of the limited role of political factors. The second sub-section presents the formal estimates.

6.1 Motivation

Before turning to the estimates, it is helpful to visualize the data. Figure 5 shows at the state-level how aggregate vote-changes (discussed in Section 4) compare with World War II spending levels over the period 1940–1944. There is a slight positive relationship between spending and votes (correlation = .32), though this seems driven in large part by states in the South, which shifted votes away from FDR and also received relatively few military contracts.

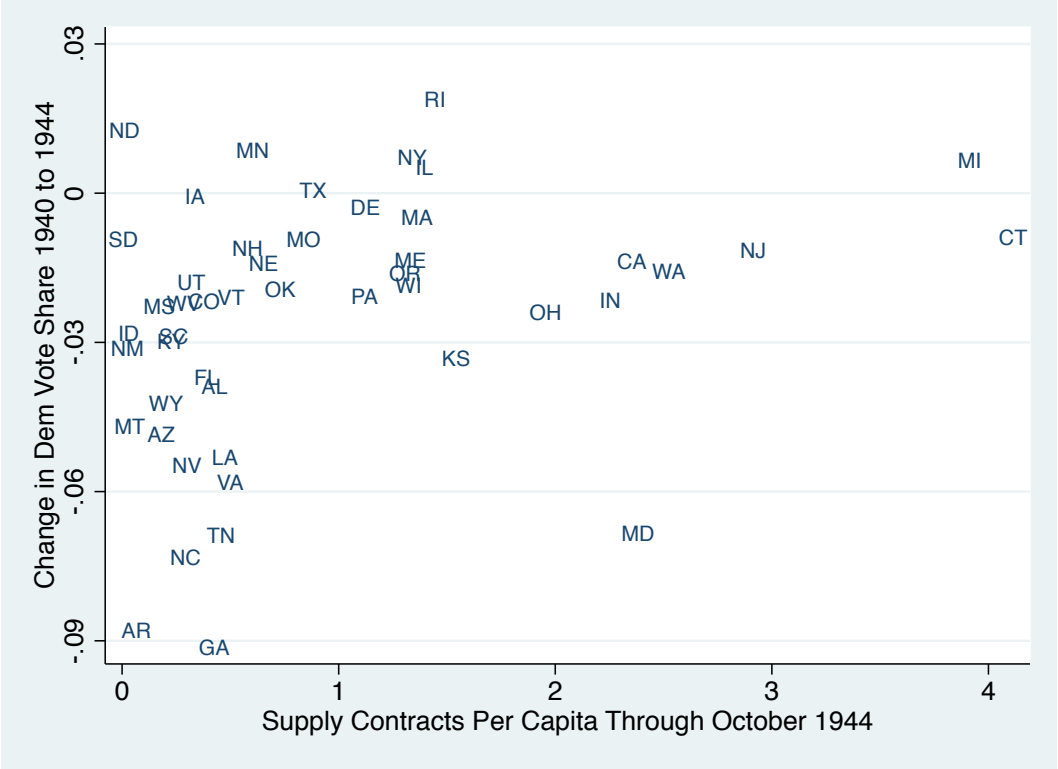


Figure 5: Change in Democratic Vote Share vs. Supply Contracts Per Capita

It is also helpful to map the data. Figure 2 from the introduction shows the annual

allocation of per capita contract spending across states. Spending is heavily concentrated in the Northeast, Industrial Midwest, and West Coast. It is also relatively stable over time, with these states getting the highest spending in the peak years (19421-1944) as well as the lower spending years at the beginning and end (1940-1941 and 1945). While this such consistency could reflect political factors, other explanations seem more relevant. Economic efficiency is likely playing a role in the allocation since the high spending states have significant industrial capacity and shipyards. It is also important to note that other regions receive substantial spending. In particular the South, which is the least pivotal region (Figure 4), has significant spending, in opposition to what would be expected from politically motivated allocation.

Figure 6 shows the temporal pattern of aggregate national spending per capita and voter support for FDR during the period between the 1940 and 1944 elections. Spending was highest at the onset of the war in 1942, and slows down substantially just before the 1944 election. This is inconsistent with the strategic allocation of spending for two reasons. First, it is the period just before the election when many voters make their final choice between candidates and so spending would be most efficient at this time in gaining votes. Second, spending is smallest during the periods when FDR was most vulnerable to not getting re-elected and so political-based allocation would be most attractive (spending changes slightly lag approval changes, but they reinforce rather than offset political support). Comparing the two series, we see spending and approval move in a similar fashion—in fact, the correlation coefficient is 0.80 for the two series. Both series surge following the attack on Pearl Harbor—with FDR approval rising first—and then both dissipate and largely bottom out in the months leading up to the 1944 election. So long as these swings in voter support were largely driven by external factors such as patriotic response to the initiation of the War, this suggests political strategy was not central to the timing of war spending which would have been more beneficial in the later years where FDR's support had diminished.

6.2 Estimates

We estimated the following model, using OLS:

$$Spending_i = \beta_0 + \beta_1 Pivot\ Probability_i + \beta_2 Total\ Manuf_i + \beta_3 Aircraft\ Manuf_i + \epsilon_i \qquad (4)$$

We estimated the model for each of the $Spending_i$ variables described above, and for each of the 30 separate *Pivot Probability* vectors, which represent the role of political factors. The *Manuf* covariates are measures of manufacturing capacity and capture the role of economic

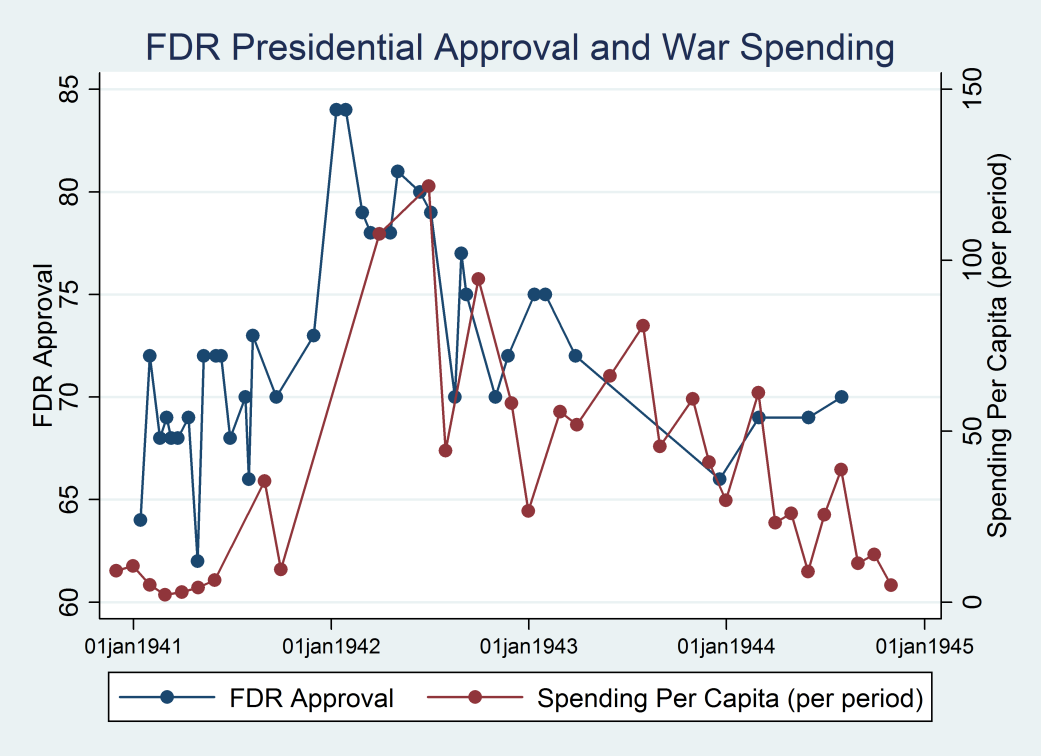


Figure 6: FDR Approval and Contract Sxspending, 1941–1944

efficiency. To ease interpretation we standardize each covariate to have mean 0 and standard deviation 1, that is for each variable we subtract the mean (which does has no substantiative effect since the constant term is of little interest and there are no interaction terms) and then divide by the standard deviation. We present our estimates graphically, with some of the underlying estimates in Section 11 in the Appendix.

Figure 7a shows the point estimates for total per-capita spending from 6/1940 through 10/1944, i.e. up to the November 1944 election, for each of the different values of the money shift parameter V^m and for $D_N = 0$ (neutral national tide). Figure 7b shows the R-square of the regression that includes all variables, as well as the R-square of a regression that includes only the *Pivot Probability* variable, and the R-square of a regression that includes only the manufacturing variables, *Total Manuf* and *Aircraft Manuf*. Figure 7c shows the point estimates and 95% confidence intervals for the *Pivot Probability* variable, for the same specifications. Figure 7d shows the point estimates and 95% confidence intervals for the *Aircraft Manuf* variable, for the same specifications.

The patterns are clear. Recall that we standardized all variables. So, Figure 7a shows that the estimated effects of the variables *Total Manuf* and *Aircraft Manuf* are both much

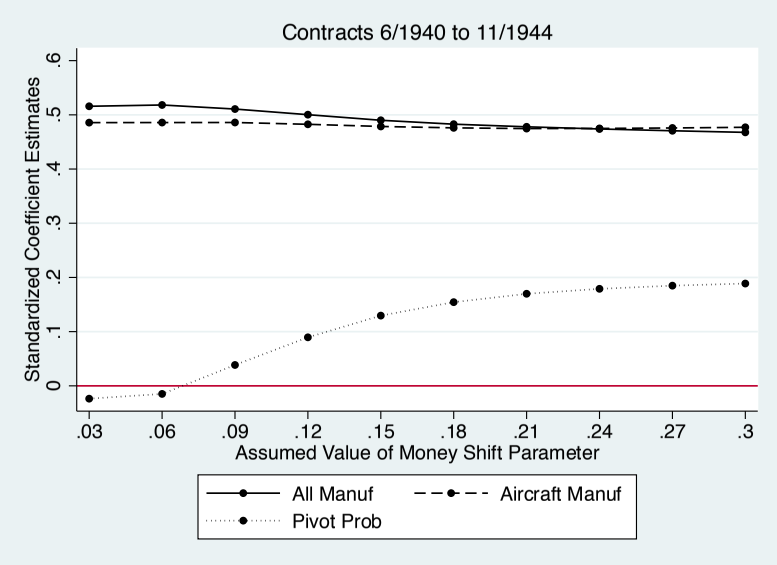
higher than the estimated effect of the *Pivot Probability* variable, for all values of V^m. Figure 7b shows that the variables *Total Manuf* and *Aircraft Manuf* account for almost all of the regression R-square, and the contribution of *Pivot Probability* is minimal. Figure 7c shows that the estimated effect of *Pivot Probability* is not even statistically significant at the .05 level, except for very large values of V_m, values of 8 or higher. By contrast, Figure 7d shows that the estimated effect of *Total Manuf* is always highly significant at the .05 level.

It is possible that although overall spending was not clearly targeted at pivotal states, spending closer to the election of 1944 was. In fact, this is not the case.[13] Figures 8a-8d are analogous to Figures 7a-7d, but the dependent variable is for contract spending only in 1944 (January through October). The overall patterns are quite similar: the estimated effects of the *Total Manuf* variable is much higher than the estimated effect of the *Pivot Probability* variable (though this is not longer the case for the *Aircraft Manuf* variable); the variables *Total Manuf* and *Aircraft Manuf* account for almost all of the regression R-square, and the contribution of *Pivot Probability* is minimal; the estimated effect of *Pivot Probability* is never statistically significant at the .05 level, even for the highest values of V_m; and the estimated effect of *Total Manuf* is always highly significant at the .05 level.

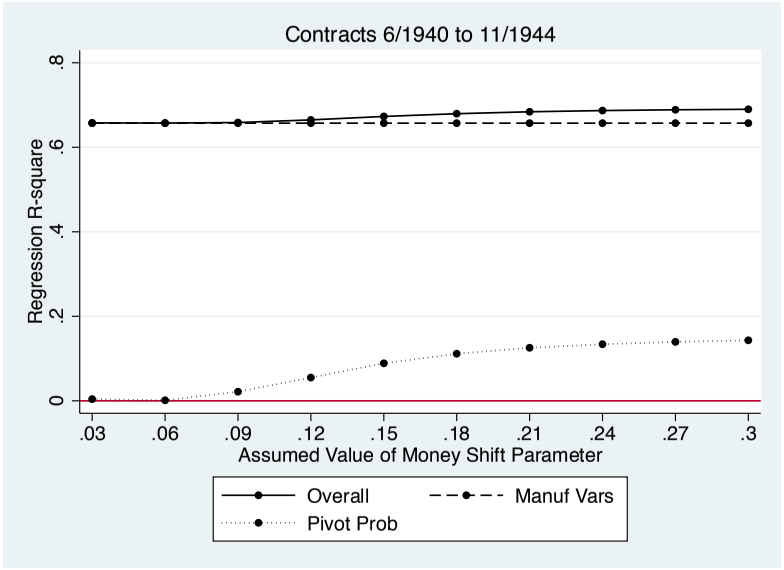
Figures 9a-9d zero in even closer to the election, examining the distribution of contract spending in the four months just prior to the election—July through 10/1944.[14] The bottom line is again the same. There is little evidence that contracts were allocated disproportionately towards pivotal states.[15]

Finally, Figures 10a-10d search for evidence of electorally-related targeting from a slightly different point of view, by studying the share of money spent in a state during the 2 or 4 months prior to the election, as a percentage of the total amount of money spent in the state over the whole war, or over the whole year 1944. In all figures we focus on the estimated coefficient and standard error of *Pivot Probability*. Figures 10a and 10b consider the 4-month period leading up to the November 1944 election (July through October), while figures 10c and 10d consider an even shorter 2-month period (September through October). In all cases the bottom line is the same: the estimated effect of *Pivot Probability* on the share of money spent during the election campaign is never statistically distinguishable from zero.

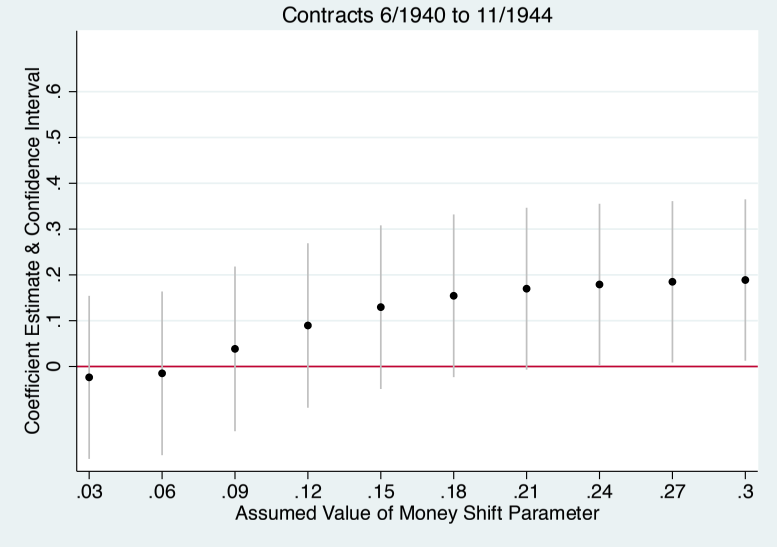
[13] As further evidence, recall from Figure 1 that little spending occurs right before the election.
[14] In these regressions we drop the *Aircraft Manuf* variable.
[15] Other intervals, two, three, or five months leading up the election exhibit similar patterns.



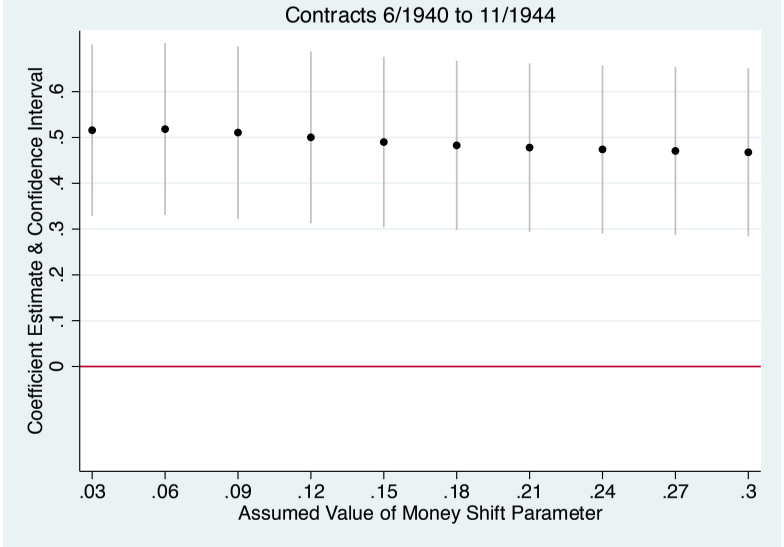
(a) Estimated Effects of Pivot Probability and Manufacturing on Per Capita Spending, 6/1940 through 10/1944, Neutral Tide



(b) Estimated R-square of Regressions on Per Capita Spending, 6/1940 through 10/1944, Neutral Tide

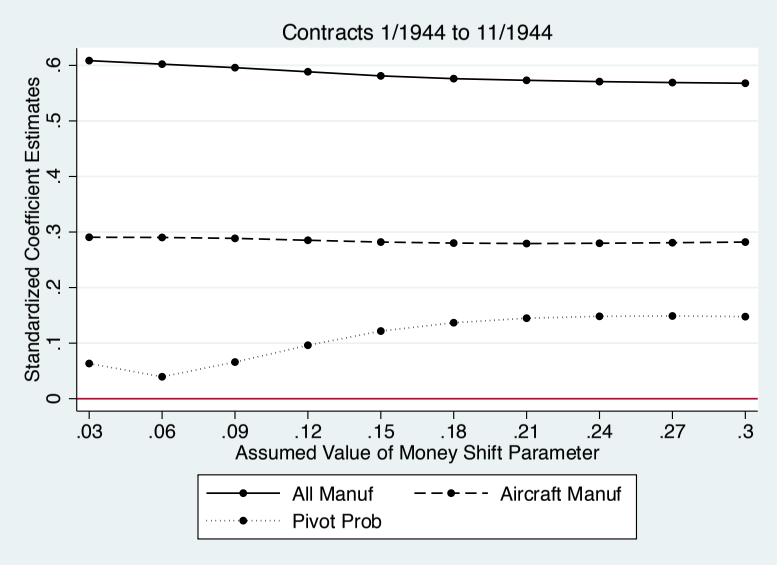


(c) Estimated Effect of Pivot Probability on Per Capita Spending, 6/1940 through 10/1944, Neutral Tide

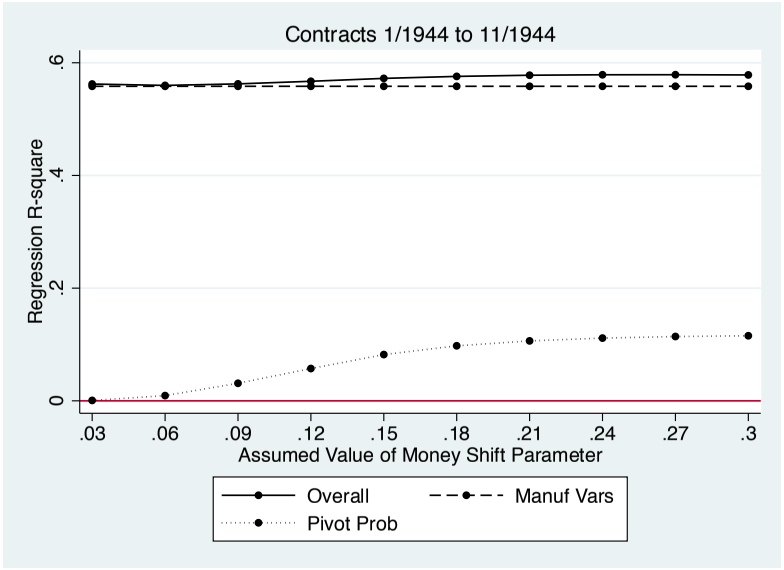


(d) Estimated Effects of Total Manufacturing on Per Capita Spending, 6/1940 through 10/1944, Neutral Tide

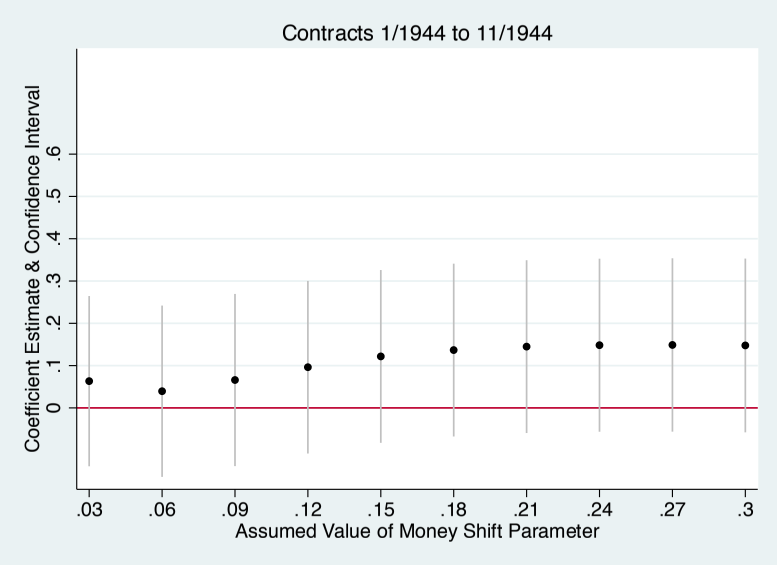
Figure 7



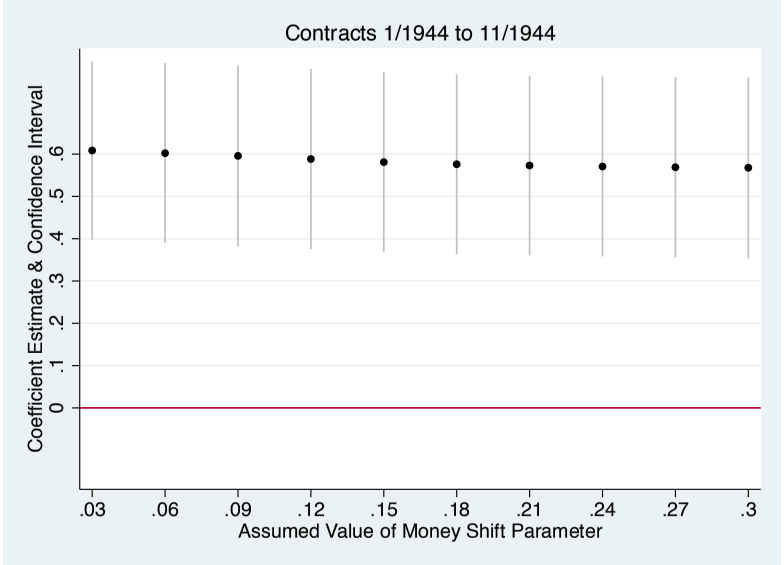
(a) Estimated Effects of Pivot Probability and Manufacturing on Per Capita Spending, 1/1944 through 10/1944, Neutral Tide



(b) Estimated R-square of Regressions on Per Capita Spending, 1/1944 through 10/1944, Neutral Tide

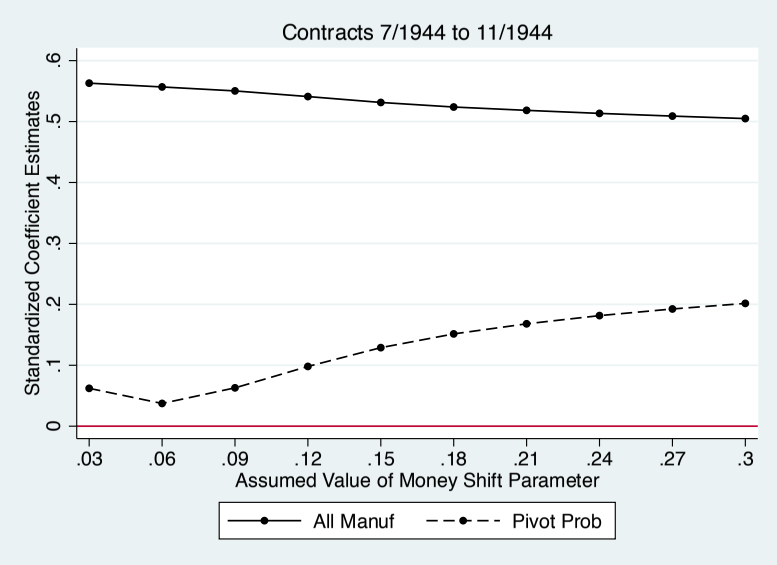


(c) Estimated Effect of Pivot Probability on Per Capita Spending, 1/1944 through 10/1944, Neutral Tide

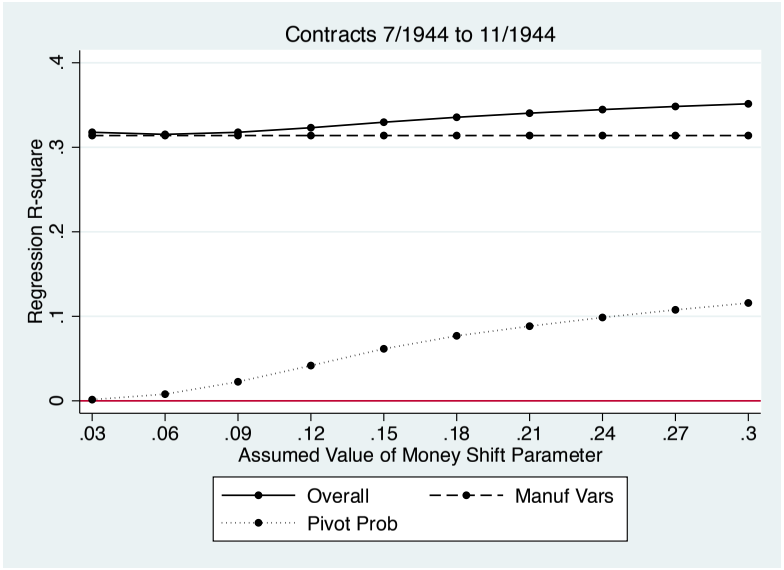


(d) Estimated Effects of Total Manufacturing on Per Capita Spending, 1/1944 through 10/1944, Neutral Tide

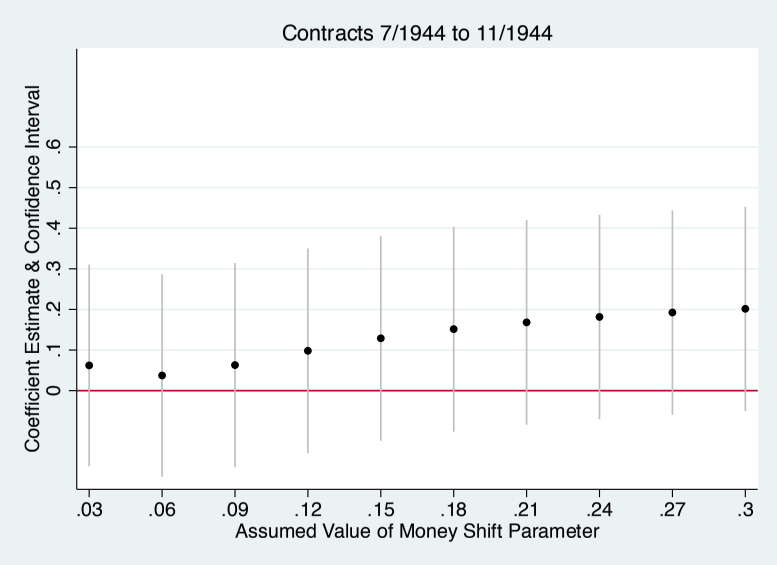
Figure 8



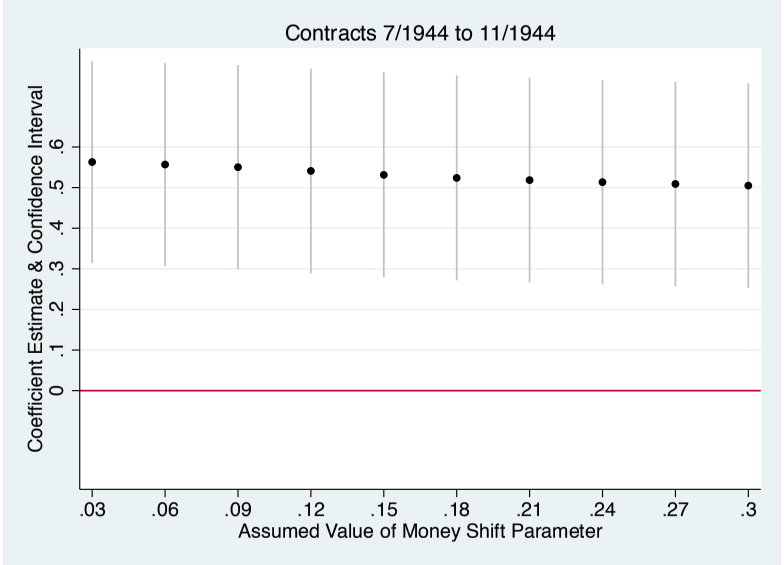
(a) Estimated Effects of Pivot Probability and Manufacturing on Per Capita Spending, 7/1944 through 10/1944, Neutral Tide



(b) Estimated R-square of Regressions on Per Capita Spending, 7/1944 through 10/1944, Neutral Tide

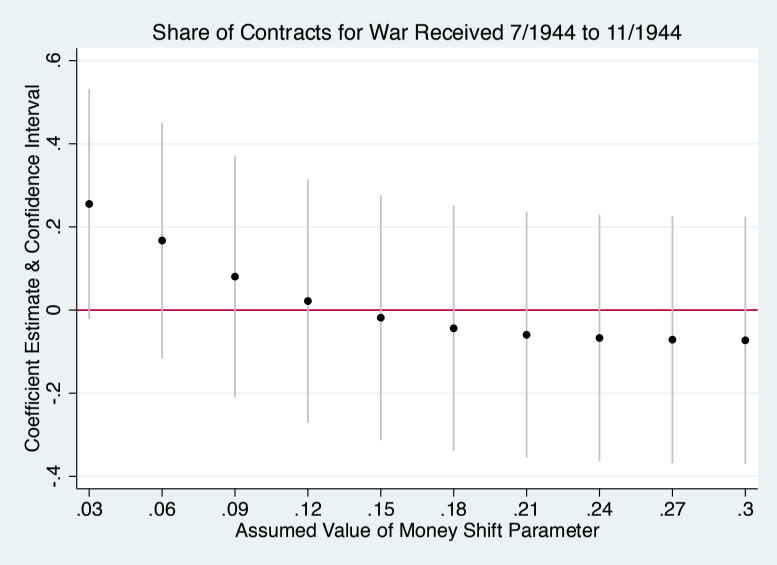


(c) Estimated Effect of Pivot Probability on Per Capita Spending, 7/1944 through 10/1944, Neutral Tide

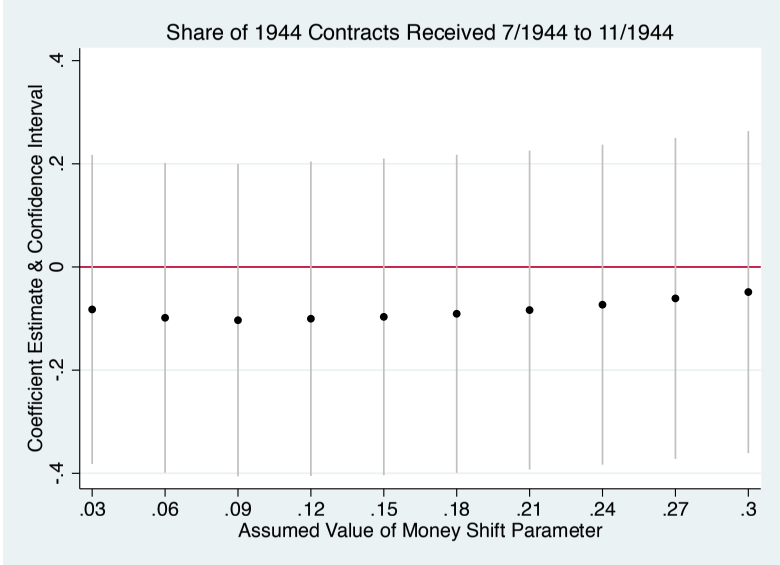


(d) Estimated Effects of Total Manufacturing on Per Capita Spending, 7/1944 through 10/1944, Neutral Tide

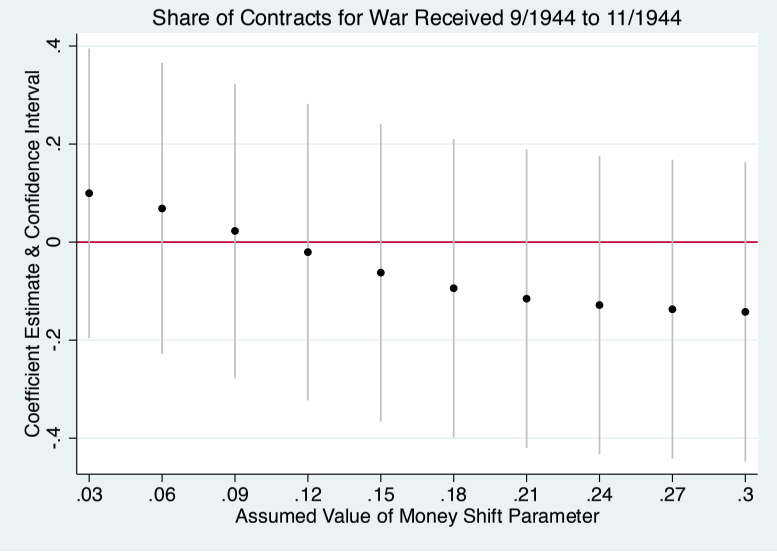
Figure 9



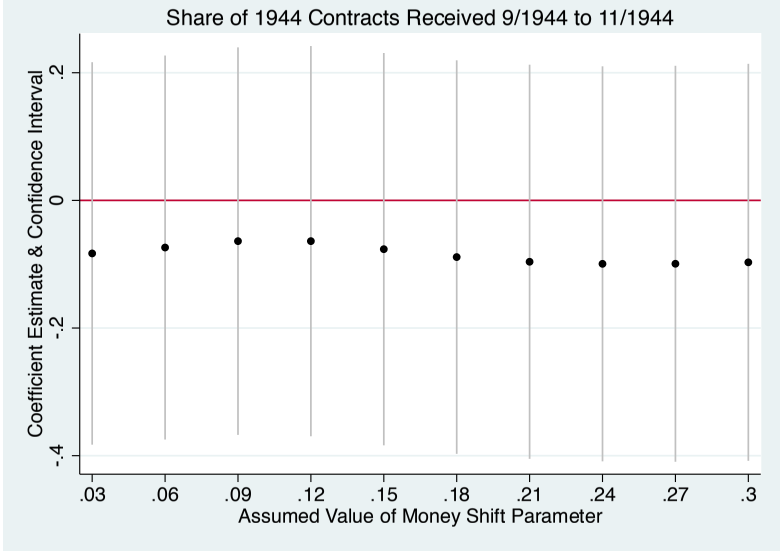
(a) Estimated Effects of Pivot Probability on Share of Total Spending, 7/1944 through 10/1944, Neutral Tide



(b) Estimated R-square of Regressions on Share of 1944 Spending, 7/1944 through 10/1944, Neutral Tide



(c) Estimated Effect of Pivot Probability on Share of Total Spending, 9/1944 through 10/1944, Neutral Tide



(d) Estimated Effects of Total Manufacturing on Share of 1944 Spending, 9/1944 through 10/1944, Neutral Tide

Figure 10

7 Robustness Checks

In this section we consider some empirical extensions. We consider whether money is allocated based on Congressional seniority or whether there are specific patterns to one specific kind of spending, facilities spending. We continue not to find strong evidence for the role of politics in either of these cases.

7.1 Congressional Seniority

While not the focus of this paper, we also ran specifications that include variables to check for congressional influence over the distribution of spending. More specifically, we constructed several indices of "institutional power" for each state and checked whether states with more powerful delegations received contract dollars. To construct the indices we use the following House and Senate positions: Speaker of the House, Majority Leader, Minority Leader, member of the House Ways and Means committee, member of the House Appropriations committee, member of the House Rules committee, member of the Senate Finance committee, member of the Senate Appropriations committee, member of the House Military Affairs committee, member of the House Naval Affairs committee, member of the Senate Military Affairs committee, and member of the Senate Naval Affairs committee. Let HS be the set of all of these positions, let H be the set of all positions from the House, let S be the set of all positions from the Senate, and let M be the set of the four positions involving defense-related committees plus the two Appropriations committees.

The broadest index, which we denote *House and Senate Overall Power*, is constructed as follows: For each state i count the total number of positions in the set HS held by the state's House and Senate delegation in year t. The chamber-specific indices, *House Overall Power* and *Senate Overall Power* are constructed similarly but each index considers only the positions in H and S, respectively. Finally, the more jurisdiction-specific index, *House and Senate Military Power* is constructed by counting only those positions in M. For each index we then divide by state population. Note that the indices will therefore reflect the Senate malapportionment that gives small states more representation per person than large states.

We present the estimates of interest in Table 5. The bottom line from the regression results is simple. None of these variables is statistically significant in any specification, the point estimates are more often negative than positive (all of the point estimates in Table 5 are negative), and in all cases the point estimates are substantively small. Importantly, including

these variables also does not substantially change the estimates on the other key variables. The estimated coefficients on *Total Manuf* and *Aircraft Manuf* remain large and highly significant, while the estimated coefficients on *Pivot Probability* are small and statistically insignificant except for extremely high values of V^m. If anything, adding the congressional power indices sometimes causes the estimated coefficient on *Pivot Probability* to fall and become statistically insignificant even for high values of V^m.

Table 5: **Supply Contract Spending and Congressional Power**

Period	V^m	Other Controls	Power Index Overall		Power Index Military Comm	
6/1940 to 11/1944		No	-0.19	(0.14)	-0.22	(0.14)
6/1940 to 11/1944	.09	Yes	-0.11	(0.09)	-0.12	(0.09)
6/1940 to 11/1944	.18	Yes	-0.09	(0.09)	-0.10	(0.09)
6/1940 to 11/1944	.27	Yes	-0.08	(0.09)	-0.09	(0.09)
1/1944 to 11/1944		No	-0.07	(0.15)	-0.13	(0.15)
1/1944 to 11/1944	.09	Yes	-0.05	(0.10)	-0.06	(0.10)
1/1944 to 11/1944	.18	Yes	-0.03	(0.10)	-0.04	(0.10)
1/1944 to 11/1944	.27	Yes	-0.02	(0.10)	-0.03	(0.10)

Cell entries show estimated coefficient on Congressional Power Index. Standard errors in parentheses.

7.2 Spending on New Facilities

The results above are all for supply contract spending, which constituted about 86% of federal spending on the war. The other 14% was for new facilities, both military and industrial. In this section we analyze facilities spending and also total spending on supply contracts plus facilities. The results are shown in Table 6.

The bottom line is again simple. With facilities spending as the dependent variable the estimated coefficient on the *Pivot Probability* variable is always very small and statistically insignificant, and in most specifications negative. This is true whether or not the *Total Manuf* and *Aircraft Manuf* variables are included.

With total spending as the dependent variable the results are, not surprisingly, similar to those for contract spending alone. For the more plausible values of V^m the estimated coefficient on the *Pivot Probability* variable is small and statistically insignificant, while for very high values of V^m the estimated coefficient is larger and statistically significant at least when the *Total Manuf* and *Aircraft Manuf* variables are excluded.

Table 6: **Total Spending & Facilities Spending**

Period	V^m	Other Controls	Spending Type: Total		Facilities	
6/1940 to 11/1944	.09	No	0.13	(0.15)	-0.06	(0.15)
6/1940 to 11/1944	.09	Yes	0.03	(0.10)	-0.03	(0.15)
6/1940 to 11/1944	.18	No	0.29	(0.14)	-0.12	(0.15)
6/1940 to 11/1944	.18	Yes	0.13	(0.10)	-0.08	(0.15)
6/1940 to 11/1944	.27	No	0.33	(0.14)	-0.13	(0.15)
6/1940 to 11/1944	.27	Yes	0.16	(0.10)	-0.08	(0.15)
1/1944 to 11/1944	.09	No	0.16	(0.15)	-0.07	(0.15)
1/1944 to 11/1944	.09	Yes	0.06	(0.11)	-0.03	(0.15)
1/1944 to 11/1944	.18	No	0.32	(0.14)	-0.04	(0.15)
1/1944 to 11/1944	.18	Yes	0.16	(0.11)	0.04	(0.15)
1/1944 to 11/1944	.27	No	0.35	(0.14)	-0.04	(0.15)
1/1944 to 11/1944	.27	Yes	0.17	(0.11)	0.05	(0.15)

Cell entries show estimated coefficient on Pivot Probability. Standard errors in parentheses.

8 Votes and the War Effort

Another possibility is that politicians might gain votes not by channeling the monies to selective places, but instead in using them to most effectively prosecute the war. The idea here is that voters are primarily concerned about winning the war, and so they would reward politicians who are successfully conducting the war. Efficient spending of money is then the optimal choice of vote-seeking politicians. We investigate this possibility below. In short we find the opposite effect: voters become more attached to the incumbent party as the war effort gets mired down, likely reflecting the conventional wisdom of not switching horses in the middle of the race.

We consider two aspects of this mechanism: how perceptions of the war status influence votes, and how the party in power influences the status of the war. Both of these topics can be analyzed using questions from the Gallup polls discussed earlier.[16]

The results (cross-tabs) are summarized in Table 7. The first values look at how voter behavior is related to beliefs about the the war status. We use the Gallup polls which asked

[16]We cannot evaluate an intermediate step, namely how spending relates to the chance (or perceived chance) of winning the war. To do this we would need to estimate a spending production function which maps spending levels and allocations across geography into war outcomes. There is not enough variation in the data to adequately estimate such a function.

voters how they would vote conditional on the war continuing and on the war ending. The bottom two panels show that having the war persist leads about 10-15% of voters to shift to Democrats relative to how they would vote if the war was to end. In addition a heavy majority of voters do not change their voting based on the war status, and that these effects are comparable for those who voted Democrat or who Republican in the 1940 election.

One challenge of interpreting these estimates is that there are two reasons that the war status could influence voter support for the president. There is the usual idea of that voters prefer continuity in their politicians so long as the war is continuing, and are more open to a change in peace time. But if the war continues for a while that might also mean the president is doing a poor job fighting the war. We explore this second possibility next by examining whether voters believe switching parties will lead the war to be wind down faster.

Table 8 presents results on how voters believe the party in power will influence how quickly the war will be prosecuted. Voters believe Republicans will be slower at ending the war, and this tilt becomes more prominent as we approach the 1944 election. Still about half of all voters believe the party in power has no effect on how quickly the war will be completed, and there are clear partisan differences with prior Democrat voters being far more skeptical of the efficacy of Republicans. But more importantly the conclusion is that voters believe a Democrat government will more quickly end the war, so they seem to comfortable in how FDR's performance.[17]

9 Conclusion

The bottom line from our analysis is straightforward. First, we find evidence consistent with the hypothesis that supply contracts during WWII were awarded to states that had high industrial capacity already in place in 1939—most likely, states with industrial plants that could be modified relatively quickly and cheaply to produce needed war supplies. Second, we do not find consistent evidence that supply contracts were awarded to states that were especially likely to be pivotal in the 1944 presidential election. Thus, the evidence suggests

[17]Further support for this comes from The Office of Public Opinion Research (OPOR) which ran a number of surveys during the war. One survey (No. 6) conducted April 2-7, 1943 included questions on whether the individual would support FDR for a fourth term if the war were over, whether he or she recalled voting for Roosevelt (vs. Willkie) in 1940, and whether the United States was doing all it possibly can to win the war. Even after controlling for backing Roosevelt in 1940, there was a positive and statistically significant relationship between reporting the United States was strong and supporting a fourth term if the war was over (regression omitted).

Table 7: **Voting Conditional on War Status**

	Conditional FDR Vote			
	Vote | War Continue	Vote | War Over	$N_{War\ Continue}$	$N_{War\ Over}$
1/28/-2/3/1943	64.0%	47.4%	1368	2445
2/25-3/2/1943	58.6%	41.4%	1309	1291
5/14-5/20/1943	58.1%	28.7%	1328	1266
3/31/-4/4/1944	55.4%	39.0%	2744	2666

	△FDR Vote			
	-1	0	+1	N
1/28/-2/3/1943	3.7%	82.2%	14.1%	1002
5/14-5/20/1943	0.6%	73.4%	25.6%	1211
3/31/-4/4/1944	0.1%	86.6%	13.3%	2587

	△FDR Vote							
	△Vote | $Vote_{1940}$=FDR			△Vote | $Vote_{1940}$=Willkie				
	-1	0	+1	-1	0	+1	N_{FDR}	$N_{Willkie}$
1/28/-2/3/1943	4.8%	84.0%	11.2%	1.9%	82.0%	16.1%	437	372
5/14-5/20/1943	0.7%	63.4%	35.8%	0.2%	87.6%	12.2%	547	428
3/31/-4/4/1944	0.2%	82.0%	17.8%	0.0%	93.5%	6.5%	1217	956

Left column is the field date for the Gallup Poll. The values are calculated from vote intentions for 1944, with Vote = +1 if plan to vote for FDR and Vote = 0 if plan to vote for GOP. In the bottom two panels △FDR Vote = Vote | War Continue − Vote | War Over (so +1 means the voter will vote for FDR if the war continues and for the GOP if it stops, 0 means the voter votes the same regardless of the war status, and -1 means the voter will vote for the GOP if the war continues and FDR if it stops). In the bottom panel the conditioning variable is retrospective voting for 1940. The Data Appendix lists the specific polls which are used.

Table 8: **Speed of Ending the War Conditional on Having A GOP Government**

	△War Speed			
	-1	0	+1	N
1/25-1/31/1942	19.4%	66.4%	14.2%	1121
3/20-3/25/1942	23.0%	52.2%	24.8%	2157
5/23-5/28/1942	39.3%	34.8%	25.9%	2350
2/18-2/23/1944	39.8%	35.2%	25.0%	2535
8/3-8/8/1944	47.5%	28.6%	23.8%	1132

	△War Speed							
	△War Speed | Vote_{1940}=FDR			△War Speed | Vote_{1940}=Willkie				
	-1	0	+1	-1	0	+1	N_{FDR}	$N_{Willkie}$
1/25-1/31/1942	29.8%	66.3%	3.9%	4.8%	64.4%	30.8%	558	376
3/20-3/25/1942	36.6%	56.1%	7.2%	5.5%	43.0%	51.4%	996	760
5/23-5/28/1942	55.7%	32.6%	11.7%	16.1%	36.7%	47.3%	1144	772
2/18-2/23/1944	62.3%	31.0%	6.7%	10.2%	39.1%	50.7%	1124	939
8/3-8/8/1944	71.1%	19.6%	9.2%	10.4%	41.0%	48.6%	530	366

Left column is the field date for the Gallup Poll. The values are calculated from whether voters believe the war will end more quickly (or a close proxy of this concept such as winning the war) if there was GOP government (it is typically not specified what level of government this refers to, but it presumably would include the presidency). △War Speed = +1 the voter thinks the war will end more quickly under a GOP government, = -1 if they believe the war will end more slowly under GOP government, = 0 if the war will end at the same time regardless of the party in power. In the bottom panel the conditioning variable is retrospective voting for 1940. The Data Appendix lists the specific polls which are used.

that the distribution of supply contracts was driven more by practical concerns than by purely political calculations.

It is possible that other political factors were at play, including inter-party competition for control of Congress, or the re-election concerns of individual congressional incumbents. Members of key House and Senate committees, or senior members, including committee and subcommittee chairs, might have sought to steer spending towards their states and districts. A careful investigation of these hypotheses requires more fine-grained data that can be mapped into congressional districts, and we leave this for future work.

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10 Data Appendix

10.1 World War II Spending Data

The state-level monthly (approx.) military spending variables are from the following reports: National Industrial Conference Board, Economic Report, Nov. 23, 1940, p. 442 (ending Oct. 31, 1940); Dec. 24, 1940, p. 482 (ending Nov. 30, 1940); Jan. 23, 1941, p. 31 (ending Dec. 31, 1940); Feb. 25, 1941, p. 71 (ending Jan. 31, 1941); March 24, 1941, pp. 117-18 (ending

Feb. 28, 1941); Apr. 24, 1941, p. 159 (ending Mar. 31, 1941); May 24, 1941, pp. 206-08 (ending Apr. 30, 1941); June 25, 1941, p. 273 (ending May 31, 1941); Oct. 24, 1941, pp. 435-36 (ending Aug. 30, 1941); Nov. 25, 1941, pp. 497-98 (ending Sept. 27, 1941); June 1942, p. 171 (ending March 31, 1942); Sept. 1942, p. 298 (ending June 30, 1942); Dec. 1942, p. 419, (ending Sept. 30, 1942); U.S. Congress. House. Select Committee Investigating National Defense Migration. Hearings before the Select Committee Investigating National Defense Migration, House of Representatives, Seventy-seventh Congress, first[-second] session, pursuant to H. Res. 113, a resolution to inquire further into the interstate migration of citizens, emphasizing the present and potential consequences of the migration caused by the national defense program. Part 11: Washington, DC Hearings, March 24, 25, 26, 1941 (Washington, DC: GPO, 1941) (data for Feb. 1941); US War Production Board, Statistics of War Production (Washington, DC: GPO). We use Nov. 1942, pp. 15-16 ($63,167m ending July 31, 1942); Dec. 1942, p. 16 ($77,085m ending Sept. 30, 1942)[18]; Jan. 1943, pp. 19-20 ($84,978m ending Nov. 30, 1942); Feb. 1943, pp. 19-20 ($84,978m also ending Nov. 30, 1942)[19]; March 1943, p. 19 ($89,572m ending Dec. 31, 1942); April 1943, p. 18 ($97,941m ending Feb. 28, 1943); May 1943, p. 19 ($97,941 also ending Feb. 28, 1943); June 1943, p. 19 ($104,953m ending March 31, 1943); July 1943, p. 20 (same also ending March 31, 1943); Aug. 1943, p. 20 ($114,222m ending May 31, 1943); Sept. 1943, p. 19 ($125,957m ending July 31, 1943)[20]; Oct. 1943, p. 18 ($132,295m ending Aug. 31, 1943); Nov. 1943, p. 21 ($140,688m ending Sept. 30, 1943); Dec. 1943, p. 21 ($146,224m ending Oct. 31, 1941); Jan. 1944, p. 21 ($148,620m ending Dec. 31, 1943); Feb. 1944, p. 22 ($148,620m also ending Dec. 31, 1943); March 1944,p. 25 ($156,523m ending Feb. 29, 1944);]April 1944, p. 24 ($159,248m ending March 31, 1944); May 1944, p. 27 ($162,644m ending April 30, 1944)[21]; June 1944, p 26 (same also ending April 30, 1944); July 1944, p. 26 ($164,477m ending May 31, 1944); Aug. 1944, p. 26 ($167, 236m ending June 30, 1944); Sept. 1944, p. 26 ($172,188 ending July 31, 1944); Oct. 1944, p. 26 ($173, 421m ending Aug. 31, 1944);

[18]Projected order included.

[19]Projected orders to GOCO excluded, foodstocks excluded. Text Dec. 1942, p, 14 "Supply data include prime awards over $50,000 reported to the WPB by the Army, Navy, Maritime Commission and Treasury Department since June, 1940 and by the British Empire and other foreign purchasing missions since September, 1939. Treasury Contract cover defense aid awards of the Procurement Division. Awards for foodstuffs are excluded. Project orders issued to Government-operated establishments are excluded, but awards made by those establishments to private industry are included. Contracts for which work location is not known are included in the 'off-continent and undesignated' total."

[20]Has a discussion of delays in reporting and cancelations.

[21]Data has been subject to some revisions.

Nov. 1944, p. 27 ($175,075m ending Sept. 30, 1944); Dec. 1944, p. 27 ($175,751m ending Oct. 31, 1944); Jan. 1945, p. 26 ($177,375m ending Nov. 30, 1944); Feb. 1945, p. 26 ($178,983m ending Dec. 31, 1944); March 1945, p. 26 ($182,915m ending Jan. 1945); April 1945, p. 26 ($186,979m ending Feb. 1945). US Office of Domestic Commerce, State and Regional Market Indicators, 1939-45, Econ. Series. No. 690, US GPO 1947 (ending June 1945).

10.2 Gallup

In analyzing the connection between spending and voting, we considered all Gallup studies over the period 1936-1944 (all codebooks and data files are available from The Roper Center, https://ropercenter.cornell.edu). We then limited the studies to those which had information about voting (either vote intentions or voter approval), or had specific questions related to other topics we focus on such as how war status influenced voting. Some studies listed below are omitted in certain analyses when they are missing key variables, or in some cases only a portion of the sample can be used (the studies often use two different forms, and respondents only see one set of questions).

For the pre-1940 election period when we analyze New Deal spending we used the following Gallup studies: USAIPO1936-0053 ("Gallup Poll # 1936-0053: Teachers' Oath/Government Loans for Farmers/Employers Insurance Contributions/Presidential Candidates," Field Dates: September 28-October 2, 1936, Sample Size: 5,599); USAIPO1937-0077 ("Gallup Poll #1937-0077: Government," Field Dates: April 7-12, 1937, Sample Size: 2,907); USAIPO1937-0095 ("Gallup Poll # 1937–095: Presidential Terms/Government Power/China/Presidential Election," Field Dates: August 11-16, 1937, Sample Size: 2,969); USAIPO1938-0108 ("Gallup Poll #1938-0108: Business and Employment/Unions/Movies/Automobiles/Presidential Election," Field Dates: January 13-18, 1938, Sample Size: 3,020); USAIPO1938-0117 ("Gallup Poll # 1938-0117: Business/War/Taxes/Presidential Elections," Field Dates: April 2-7, 1938; Sample Size: 3,136); USAIPO1938-0129 ("Gallup Poll # 1938-0129: Roosevelt and his Son James/Labor Unions," Field Dates: July 29-August 3, 1938, Sample Size: 3,081); USAIPO1939-0144 ("Gallup Poll # 144," Field Dates: January 12-17, 1939, Sample Size: 3,063); USAIPO1939-0154 ("Gallup Poll # 1939-0154: Presidential Election/Sources of News/Wagner Labor Act," Field Dates: April 8-13, 1939, Sample Size: 3,098); USAIPO1939-0166 ("Gallup Poll # 1939-0166: Business Conditions/Japan/Roosevelt/1940 Presiden-

tial Election," Field Dates: August 10-15, 1939, Sample Size: 3,117); USAIPO1939-0179 ("Gallup Poll # 1939-0179: Prohibition/World War II /1940 Presidential Election/Movies," Field Dates: December 15-21, 1939, Sample Size: 3,141); USAIPO1940-0186 (""Gallup Poll # 1940-0186: Health/South America/War in Europe/Presidential Election," Field Dates: March 8-14, 1940, Sample Size: 3,180); USAIPO1940-0205 ("Gallup Poll # 1940-02015: Military Service/Colonel Lindbergh's Radio Speech/1940 Presidential Election/Movies," Field Dates: August 10-16, 1940; Sample Size: 5,825); USAIPO1940-0222 ("Gallup Poll # 222," Field Dates: November 5-10, 1940, Sample Size: 6,349).

For the period between the 1940 and 1944 elections when we analyze World War II spending we used the following Gallup studies: USAIPO1941-0229 ("Gallup Poll # 1941-0229: Newspapers/Presidential Election/Lease-Lend Bill/War in Europe," Field Dates: January 24-29, 1941, Sample Size: 3,124); USAIPO1941-0234 ("Gallup Poll # 1941-0234: World War II /Defense Industry Strike/Politics," Field Dates: April 10-15, 1941, Sample Size: 3,113), USAIPO1941-0243 ("Gallup Poll # 243," Field Dates: July31-August 4, 1941, Sample Size: 3,048); USAIPO1941-0254 ("Gallup Poll # 1941-0254: War in Europe/Price Controls/Strikes/Exercise," Field Dates: November 27-December 2, 1941, Sample Size: 3,033); USAIPO1942-0262 ("Gallup Poll # 1942-0262: Military Draft/Employment/World War II ," Field Dates: February 25-March 2, 1942, Sample Size: 3,106); USAIPO1942-0270 ("Gallup Poll # 270," Field Dates: June 11-16, 1942m Sample Size: 2,932); USAIPO1942-0276 ("Gallup Poll # 1942-0276: Military Draft/Elections/Effects of the War/Movies," Field Dates: September 5-10, 1942, Sample Size: 3,025); USAIPO1942-0284 ("Gallup Poll # 1942-0284: Politics/World War II ," Field Dates: November 19-26, 1942, Sample Size: 2,862); USAIPO1943-0288 ("Gallup Poll # 288," Field Dates: January 28-February 3, 1943, Sample Size: 3,095); USAIPO1943-0294 ("Gallup Poll # 1943-0294: Peace terms with Germany/War Effort/Labor Unions/Presidential Election," Field Dates: April 29-May 5, 1943, Sample Size 2,967); USAIPO1943-0300 ("Gallup Poll # 1943-0300: Voting Age/Presidential Election/Political Parties/World War II /Taxes," Field Dates: August 19-25, 1943, Sample Size: 3,065); USAIPO1943-0306 ("Gallup Poll # 1943-0306: Civil Service/World War II /1944 Presidential Election/movies," Field Dates: November 11-17, 1943, Sample Size: 3,049); USAIPO1944-0311 ("Gallup Poll # 1944-0311: Scrap Paper Drive/Roosevelt/Presidential Election," Field Dates: February 3-9, 1944, Sample Size: 3,009); USAIPO1944-0318 ("Gallup Poll # 1944-0318: Gardening/1944 Presidential Elec-

tion/Montgomery Ward Plants in Chicago/War," Field Dates: May 11-17, 1944, Sample Size: 2,648); USAIPO1944-0325 ("Gallup Poll # 1944-0325: War Workers/1944 Presidential Election/U.S. Army Leaders/Sidney Hillman," Field Dates: August 18-23, 1944, Sample Size: 4,321); USAIPO1944-0335 ("Gallup Poll # 335," Field Dates: November 17-22, 1944, Sample Size: 2,529).

For estimates relating to the war effort between 1941 and 1944 we used the following studies (as well as some from the previous paragraph): USAIPO1942-0259 ("Gallup Poll # 1942-0259: Education/Prohibition/War Industries in Europe/Supply Shortages/Politics," Field Dates: January 25-31, 1942); USAIPO1942-0264 ("Gallup Poll # 1942-0264: War Effort/Congress/1944 Presidential Election/Recreation," Field Dates: March 20-25, 1942, Sample Size: 2,738); USAIPO1942-0268 ("Gallup Poll # 268," Field Dates: May 23-28, 1942, Sample Size: 3,000); USAIPO1942-0283 ("Gallup Poll # 1942-0283: Prohibition/Employment/Republican Presidential Candidates/Federal Income Taxes," Field Dates" November 12-17, 1942, Sample Size: 3,019); USAIPO1943-0290 ("Gallup Poll # 1943-0290: Food Rationing/Military/Income Taxes," Field Dates: February 15-March 2, 1953, Sample Size: 3,004); USAIPO1943-0295 ("Gallup Poll # 1943-0295: Gardening/Farming/Canada/ Taxes/Labor Unions/Women," Field Dates: May 14-20, 1943, Sample Size: 3,095); USAIPO1943-0296 ("Gallup Poll # 1943-0296: Presidential Election/World War II /Political Parties," Field Dates: June 4-10, 1943, Sample Size: 2,953); USAIPO1943-0301 ("Gallup Poll # 1943-0301: Military Service/1944 Presidential Election/World War II /International Police Force," Field Dates: August 26-September 2, 1943, Sample Size: 3,056); USAIPO1944-0312 ("Gallup Poll # 1944-032: War Effort/Politics/Taxes," Field Dates: February 18-23, 1944, Sample Size: 2,963); USAIPO1944-0315 ("Gallup Poll # 1944-0315: Military Wages/Draft/1944 Presidential Election/War Bonds," Field Dates: March 31-April 4, 1944, Sample Size: 3,014); USAIPO1944-0317 ("Gallup Poll # 1944-0317: Sacrifices for the War/Presidential Elections/World War II ," Field Dates: April 27-May 3,1944, Sample Size: 2,995); USAIPO1944-0324 ("Gallup Poll # 1944-0324: Germany/1944 Presidential Election/U.S. Army Leaders," Field Dates: August 3-8, 1944, Sample Size: 4,574).

11 Results Appendix

Table 9: **Coefficent Estimates and F-Tests**
Contracts 6/1940 to 11/1944
No Tide

Money Shift	All Manuf	Aircraft Manuf	Pivot Prob	R^2	p-value of F
1	0.516	0.486	-0.024	0.658	0.000
	(0.093)	(0.093)	(0.088)		
2	0.518	0.486	-0.015	0.657	0.000
	(0.093)	(0.093)	(0.089)		
3	0.511	0.486	0.038	0.659	0.001
	(0.094)	(0.093)	(0.089)		
4	0.500	0.483	0.089	0.665	0.004
	(0.093)	(0.092)	(0.089)		
5	0.490	0.479	0.130	0.673	0.012
	(0.092)	(0.091)	(0.089)		
6	0.483	0.476	0.154	0.679	0.023
	(0.092)	(0.090)	(0.088)		
7	0.478	0.475	0.170	0.684	0.034
	(0.091)	(0.089)	(0.088)		
8	0.474	0.475	0.179	0.687	0.041
	(0.091)	(0.089)	(0.087)		
9	0.471	0.476	0.185	0.689	0.047
	(0.091)	(0.088)	(0.087)		
10	0.468	0.477	0.189	0.690	0.051
	(0.091)	(0.088)	(0.087)		

Standard errors in parentheses. F-Test for null hypothesis that coefficients on Pivot Prob and All Manuf and Aircraft Manuf are equal.