Journal of Public Economics 166 (2018) 145–161

Contents lists available at ScienceDirect

Journal of Public Economics

journal homepage: www.elsevier.com/locate/jpube

The arsenal of democracy: Production and politics during WWII☆

Paul W. Rhode[a,b], James M. Snyder, Jr.[b,c], Koleman Strumpf[d,*]

[a]Department of Economics, University of Michigan, United States of America
[b]NBER, United States of America
[c]Department of Government, Harvard University, United States of America
[d]Department of Economics, Wake Forest University, United States of America

ARTICLE INFO

Article history:
Received 13 January 2018
Received in revised form 17 August 2018
Accepted 21 August 2018
Available online 21 September 2018

Keywords:
Distributive politics
Government spending
Presidential elections

ABSTRACT

We study the geographic distribution of military supply contracts during World War II. This is a unique case, where $3 trillion current day dollars was spent. 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. Electoral college pivot probabilities are weak predictors of contract (and new facilities) spending, and under the most plausible assumptions they are essentially unrelated to spending. This is true over the entire period 1940–1944, and 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.

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%, a level never attained before or since—see Fig. 1.[1] In addition to enrolling 16.4 million Americans in the armed forces (about one-eighth of the 1940 population), the federal government spent $196 billion between June 1940 and June 1945 on military supply contracts and $31 billion on investments in new production facilities. In 2018 dollars, this is equivalent to roughly $3.2 trillion. Although this war effort—coined the "Arsenal of Democracy" by President Roosevelt—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 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. 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.[2]

To measure the electoral importance of each state we employ a model similar to that in Strömberg (2008). The model incorporates pre-war voting data, and accounts for the size, closeness and variability of state votes as well as correlation between state vote outcomes. Simulations based on this model yield estimates of the relative probability that each state would be pivotal (some level of spending will change both the state and electoral college winner) in the 1944 presidential election. We provide evidence that this pivot probability measure reflects the relative electoral value of different states, and that it is superior to alternative measures from the literature.

To measure the economic importance of each state we use estimates of industrial capacity at the beginning of the war. States such as Connecticut, Michigan, and New Jersey already had large factories producing automobiles, trucks, airplanes, ships, and steel, and thousands of trained and experienced factory workers. Converting this physical and human capital to wartime production was generally

☆ We thank participants at the 2016 PECA conference at the Northwestern University, 2017 Wallis Conference at the University of Rochester, University of Bath, Sanford Gordon, and Anthony Fowler for comments. Price Fishback generously provided New Deal spending data. A supplemental appendix is available on the webpage of the corresponding author. Declarations of interest: none. We also thank the editor and two anonymous referees for their valuable suggestions.

* Corresponding author.
E-mail address: strumpks@wfu.edu (K. Strumpf).

[1] Source: Federal Reserve Bank of St. Louis, U.S. Office of Management and Budget, https://fred.stlouisfed.org/series/FYONGDA188S.

[2] We also consider other electoral goals, discussed below.

https://doi.org/10.1016/j.jpubeco.2018.08.010
0047-2727/

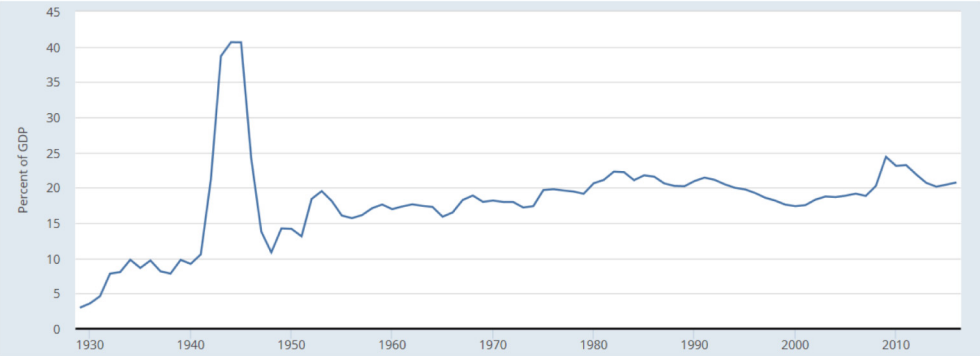


Fig. 1. Federal net outlays as percent of GDP.

much cheaper than starting 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.

Our empirical findings provide robust evidence consistent with the hypothesis that economic factors strongly influenced the allocation of supply contracts, and that distributional 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. For example, pre-existing manufacturing capacity alone can explain over 60% of the inter-state variation in contract spending over the war. Electoral college pivot probabilities are at best weak predictors of contract spending, and under the most plausible assumptions they are essentially unrelated to spending.[3] This is true over the entire period 1940–1944, and 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.

There is additional evidence of the limited scope of political targeting. We find no evidence that spending on *new* military and industrial facilities was targeted towards politically pivotal states. New facilities also constituted a much smaller share of federal war spending than supply contracts. If political allocation was the driving factor, this share would be higher since it was easier to place new facilities in any location (such as electorally valuable areas) while supply contracts generally required using pre-existing manufacturing plants. With respect to congressional considerations, we find no significant relationship between the distribution of spending and states' representation on key military or appropriations committees. Nor do we find evidence that war spending is directed to states with closely contested senate or gubernatorial elections.

A potential concern is that the 1944 presidential election was a foregone conclusion, and so there was little need for politically-motivated allocation of war funds. However, there was significant uncertainty about the outcome. Based on contemporaneous prediction market odds (Rhode and Strumpf, 2004), even in the weeks before the election there was a 25% chance that Dewey would win the presidency. Roosevelt's Gallup Poll voter approval numbers also dropped steadily by ten percentage points over 1943, and the substantial Republican victories in 1942 (when they gained 46 House seats and 9 Senate seats) were viewed as a lack of confidence in the president. Nor were wartime leaders ensured of re-election, as Churchill's loss in 1945, just two months after VE Day, illustrates. This should have provided strong incentives to allocate war funds for political gains. Dewey also had better odds than FDR's opponents did in 1936, when there was evidence (discussed below) Roosevelt allocated New Deal spending in part to increase his electoral chances.

What are we to conclude from these results? Consider first the classic literature on distributive politics. In a series of influential papers, Lindbeck and Weibull (1987), Dixit and Londregan (1995, 1996), and others develop models where electoral competition drives political parties to target divisible resources towards groups or regions with relatively large numbers of "swing" voters. Colantoni et al. (1975), Snyder (1989), Strömberg (2008), and others develop related models in the context of allocating campaign resources.

The evidence on campaign resource allocation tends to strongly support the swing-voter models. In particular, a number of papers find that battleground states—that is, those with an expected Democratic vote share near 50%—receive a disproportionate share of the advertising in U.S. presidential campaigns (Colantoni et al., 1975; Nagler and Leighley, 1992; Shaw, 2006; Strömberg, 2008; Huang and Shaw, 2009).

The evidence for government expenditures is more mixed. Studies of New Deal spending, federal grants, and federal employment typically find that states with presidential vote shares nearer to one-half, or more volatile presidential vote swings, or states that are more "productive" in terms of electoral votes, receive more federal aid—for example, Wright (1974), Wallis (1987, 1991, 1996, 1998), and Fleck (1999).[4] Studies of spending in more recent time periods, however, such as Larcinese et al. (2006) and Larcinese and Snyder (2013), find no evidence that states receive more federal funds if they have closer presidential races, more frequent presidential partisan swings, or a larger percentage of self-identified independent or moderate voters.[5]

[3] A key free parameter in our model is how responsive votes are to spending—we use values based on estimates which relate voting preferences in Gallup polls to both World War II and New Deal spending.

[4] While most papers on the New Deal find some role for politics, there is some debate on its magnitude and the role of other factors. Strömberg (2004) shows that the statistical significance of these estimates vanish when state fixed effects are included, suggesting that the results might be spurious and the result of omitted-variable bias. Wallis (1998) finds that the results depend on the specification used and the set of states included. Fishback et al. (2003) study New Deal spending at the county level and find mixed evidence for pivotal politics—for some programs the distribution of spending appears to be related to electoral volatility or turnout at the county level, while for other programs it is not.

[5] The literature on distributive politics is vast, and includes several other branches, including studies of the distribution of spending across districts or counties rather than states; the hypothesis that government expenditures flow disproportionately to areas with more "core" or "loyal" party voters; and institutional factors such as committee structure, the distribution of party and committee leadership positions, legislative seniority, majority party membership, malapportionment, and universalism norms. Finally, there are many studies of distributive politics outside the U.S.

Taken at face value, our results can be added to the studies finding weak evidence of electoral distributive politics. There was little political targeting despite the ample opportunity from the vast size of war spending. Our work helps advance the broader literature because the application and the tools we use overcome important empirical challenges.[6] However, drawing general lessons might be inappropriate because World War II was no ordinary period of history.[7]

One possibility is that due to the enormous stakes involved, pragmatic concerns related to winning the war dominated electoral concerns. 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" (House of Commons, 18 June 1940). It might not be surprising, therefore, to find the U.S. government acting as if it placed an extremely high value on social welfare *per se*. At the same time the Great Depression could also be viewed as a threat to the future of the country, and yet distributive politics helped guide the geographic allocation of New Deal spending which Roosevelt also oversaw.

A second possibility is that the Roosevelt administration was focused on winning the war because of its electoral benefits. A number of political economy models incorporate both public goods and distributive goods.[8] One (unsurprising) result 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. Although we do not have an accurate measure of the value voters placed on the "public good" of defeating Germany and Japan, it was plausibly quite large.

It is often difficult, of course, to distinguish a concern for social welfare from a concern for votes. We find mixed evidence regarding votes. On one hand, in the Office of Public Opinion Research (OPOR) surveys and Gallup polls, as the war proceeded respondents became more confident that the war would end more quickly if the Democrats remained in power than if the Republicans held power. This suggests that the war effort increased voter support for Roosevelt. On the other hand, in Gallup and OPOR polls, voters reported that they would be more willing to support Republicans in 1944 if the war was over before the election. This suggests that electoral considerations favored a "slow but steady" approach to the war effort.

And finally voters might be less responsive to spending during a war as they are focused on other issues and the economy is approaching full employment. Utilizing opinion polls from Gallup, we investigate whether military spending in a state appears to have influenced voter support for Roosevelt. The results show that the impact of spending on voter support was not large. This might be one reason we find little evidence of targeting.

At a minimum, our evidence suggests that models which focus exclusively on "tactical" distributional politics—for example, Lindbeck and Weibull (1987), Dixit and Londregan (1995, 1996), McCarty (2000), Strömberg (2008), and Primo and Snyder (2008)—might do poorly at predicting government behavior during times of national crisis. In the conclusion we return to the implications of and possible reasons for our findings. An online Appendix contains additional results, data sources, and institutional background—see also Rhode et al. (2017) for an extended NBER working paper version with additional results.

We also contribute to the relatively unexplored topic of World War II spending. The only previous studies of World War II spending, Rhode (2000) and Bateman and Taylor (2003), also fail to find support for the swing-voter or swing-state hypotheses. Rhode (2000) is the first paper to analyze the determinants of World War II spending. Rhode is most interested in the case of California so his analysis of spending across states is limited. He does, however, consider both political and economic factors, as we do below. Bateman and Taylor (2003) conduct a similar analysis, and largely replicate Rhode's results. We build on these papers in several ways. First—and this is one of our main contributions—we use a more rigorous and theoretically grounded measure of each state's relative influence in the electoral college. Second, we analyze the timing of spending in addition to overall levels, to check for electoral cycle effects. Finally, we go beyond the aggregate data and examine individual-level survey data on (i) the degree to which voting decisions in the 1930s and 1940s appear to be influenced by the distribution of federal spending, and (ii) the degree to which voting decisions during World War II appear to be influenced by U.S. efforts to win the war.

2. Background on World War II spending

The military procurement system used in the Second World War provided ample opportunity for political gains or economic efficiency. Various government bureaus—newly created during the war and run by leading business executives—set the level, type and allocation of this spending. While efficiency was supposed to guide these bureaus, political pressure was explicitly and implicitly applied to shape their decisions and production speed was prioritized over competitive bidding. The push to get local spending stemmed in part from the desirable employment it created, with a significant pay premium for war-related jobs. While an astonishing level of armaments were manufactured, there were also glaring examples of inefficiencies which could be consistent with political meddling. Appendix A provides detailed evidence on these points, a condensed timeline, and spending graphs along with the key wartime events.

In the interwar period, the U.S. government spent only 1–2% 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 imposed profit limits on aircraft and shipbuilding contracts under the 1934 Vinson–Trammel and 1936 Merchant Marine Acts. The tiny size of the military prior to the war helps alleviate concerns that the distribution of pre-existing manufacturing capacity might be endogenous. Following the outbreak of full-scale war in September 1939, defense spending rose steadily to over 40% of GDP in 1945 (real spending in 1945 was 34 times larger than in 1940). As spending ramped up over the 1939–1945 period, operating principles changed. Procurement contracts became more informal which allowed greater production speed but with few incentives for cost reductions, and spending was typically tied to a specific location.

A series of civilian-run agencies were created within the executive branch to govern procurement and industrial mobilization. They were given broad powers regarding war production and procurement, including converting civilian plants to military production and

[6] One difficulty is accounting for pre-existing spending patterns, but that is not a significant concern here since military spending was quite small in the 1930s. A second problem is to find a suitable measure of efficiency, but here pre-war private sector manufacturing capacity is a natural candidate since it was easy to re-purpose for military production. And finally we make some methodological advancements in terms of how to evaluate the political value of different states.

[7] Besides the general ways in which wartime spending differs, there are specific features of WWII. Specially created agencies played a central role in military procurement policies, and the leaders of these organizations were typically civilian business executives rather than politicians. Private production also fell sharply, as some war spending was a reallocation from civilian to military manufacturing.

[8] See, for example, Leblanc and Snyder (2000), Lizzeri and Persico (2005), Battaglini and Coate (2008), Volden and Wiseman (2007), and Cardona and Rubí-Barceló (2013). Besley and Persson (2009) discuss major wars in this context, and also argue that wars can stimulate "state-building" activities.

in directing new infrastructure building.[9] The commissions were specifically tasked with trying to produce efficiently. New facilities were to be put in areas where there were adequate nearby resource and pools of specialized labor, but not so dense as to lead to congestion.

Nonetheless, there is an extensive record of political meddling in the process.[10] 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. Donald Nelson, who headed a key plant location commission, said: "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. These boards were largely put in place during mid-1941.

Politics or peacetime objectives played crucial roles in certain key decisions. In 1938, the U.S. Maritime Commission received congressional permission to grant contracts to shipyards in the South and West despite their higher cost structures (Lane, 1947, 102–104). 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 a 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 Corp, Representative Andrew May of Kentucky, chair of the House Committee on Military Affairs, and Senator Theodore Bilbo of Mississippi.

As these points suggest, voters valued local war spending. War-related employment was truly a premium job.[11] And workers perceived this. For example, in a May 1944 Gallup Poll, only 6% of those employed in war plants expected to receive higher wages after the war, while 52% expected to receive lower wages. In addition to paying a higher wage, a potential benefit of having local production is that men necessary for war production received deferments from military service. As discussed earlier, voters pushed their Congressmen to seek additional spending for their communities. There was active lobbying to influence the geographic allocation of war spending, which would only happen if spending was perceived as benefiting the area where it is located.

With this as a backdrop, how did production proceed? The goal of serving as the Arsenal of Democracy was met, with a vast output of every kind of munition. Production costs fell and speed increased over the course of the war, in part due to the emphasis on using pre-existing manufacturing capacity which took less time, leveraged the local specialized labor force, and avoided new construction costs (relative to building new facilities). At the same time there were many glaring examples of inefficiencies. For example, there were regional bottlenecks in production due to manpower shortages. While the War Manpower Commission was specifically tasked to aid in worker allocation, in 1943 there were extreme shortages of workers on the Pacific Coast which had large boat and aviation production plants and at the same time there was a surplus of farm workers or those in higher paying but non-essential industries; it took over a year for the commission to ameliorate this and reduce production delays. One reason for the delay was the political influence of the farm bloc—agricultural workers were deferred from the draft over much of the war, so many workers moved to or stayed on farms to maintain their deferral status. Similarly, each year during the war there were thousands of labor strikes resulting in millions of lost man-days.

3. Data and summary statistics

The analysis employs data collected from a variety of primary and secondary sources. 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. The Data Appendix, Section B.1, lists the specific sources and provides details on how the these variables are constructed.

For economic efficiency we consider pre-war capacity measures. The manufacturing employment variables, including the number of wage-earners in total, in aircraft (SIC 372) and shipbuilding (SIC 373) in 1939 are from U.S. 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).

Table 1 presents key summary statistics—mean, median, standard deviation—used in the state-level spending analyses below. Spending did not become significant until after the U.S. entered the

Table 1
Summary statistics for state-level analyses.

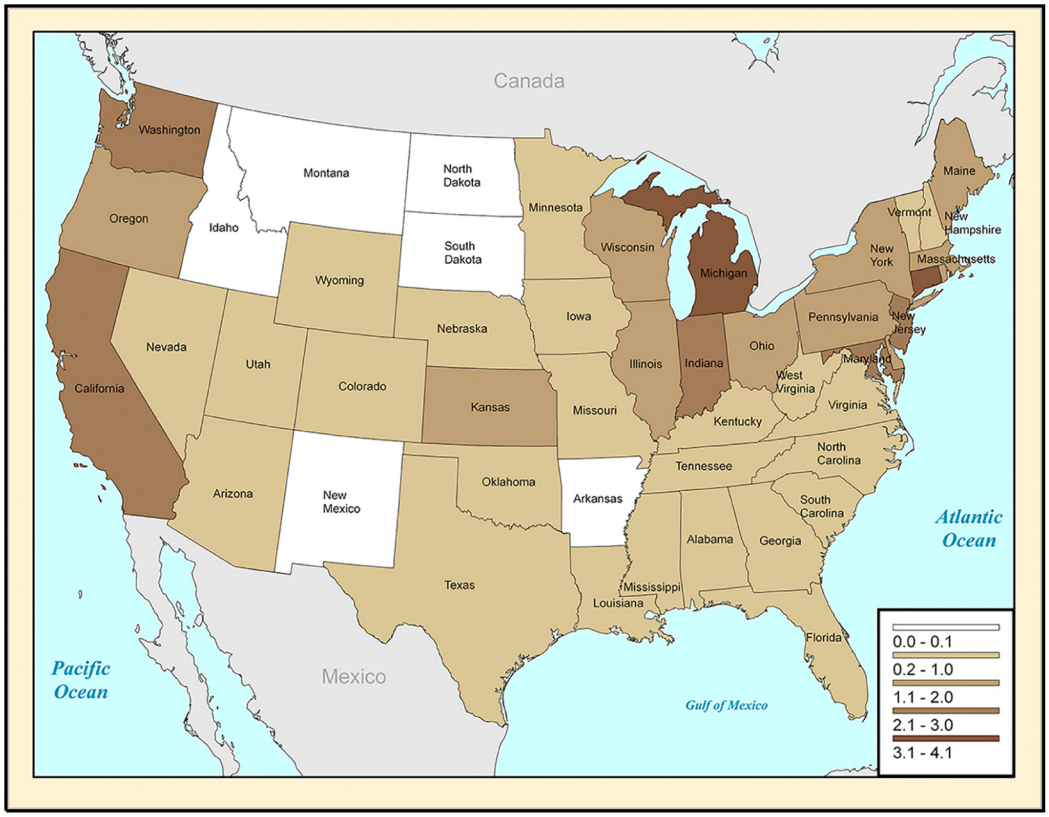
	Mean	Median	Std. dev.	Min	Max
Manufacturing employment					
Total manufacturing PC	49.568	42.886	36.096	4.058	148.792
Aircraft manufacturing PC	0.313	0.000	0.855	0.000	4.268
Shipbuilding manufacturing PC	0.493	0.057	0.896	0.000	3.146
Spending (thousand $)					
1940 spending PC	0.068	0.024	0.092	0.000	0.326
1941 spending PC	0.058	0.036	0.060	0.000	0.283
1942 spending PC	0.341	0.106	0.456	0.000	2.195
1943 spending PC	0.320	0.223	0.332	0.000	1.695
1944 spending PC	0.200	0.160	0.182	0.000	0.813
1945 spending PC	0.100	0.069	0.126	0.000	0.612
Spending PC (thru Oct 1944)	0.964	0.542	0.982	0.006	4.114
Spending PC (Jan–Oct 1944)	0.176	0.138	0.168	0.000	0.791
Spending PC (Sep–Oct 1944)	0.017	0.012	0.021	0.000	0.079
Spending PC (Aug–Oct 1944)	0.019	0.018	0.061	0.000	0.195
Spending PC (Jul–Oct 1944)	0.049	0.036	0.057	0.000	0.195
Spending PC (Jun–Oct 1944)	0.071	0.047	0.071	0.000	0.255

$N = 48$ for all variables.

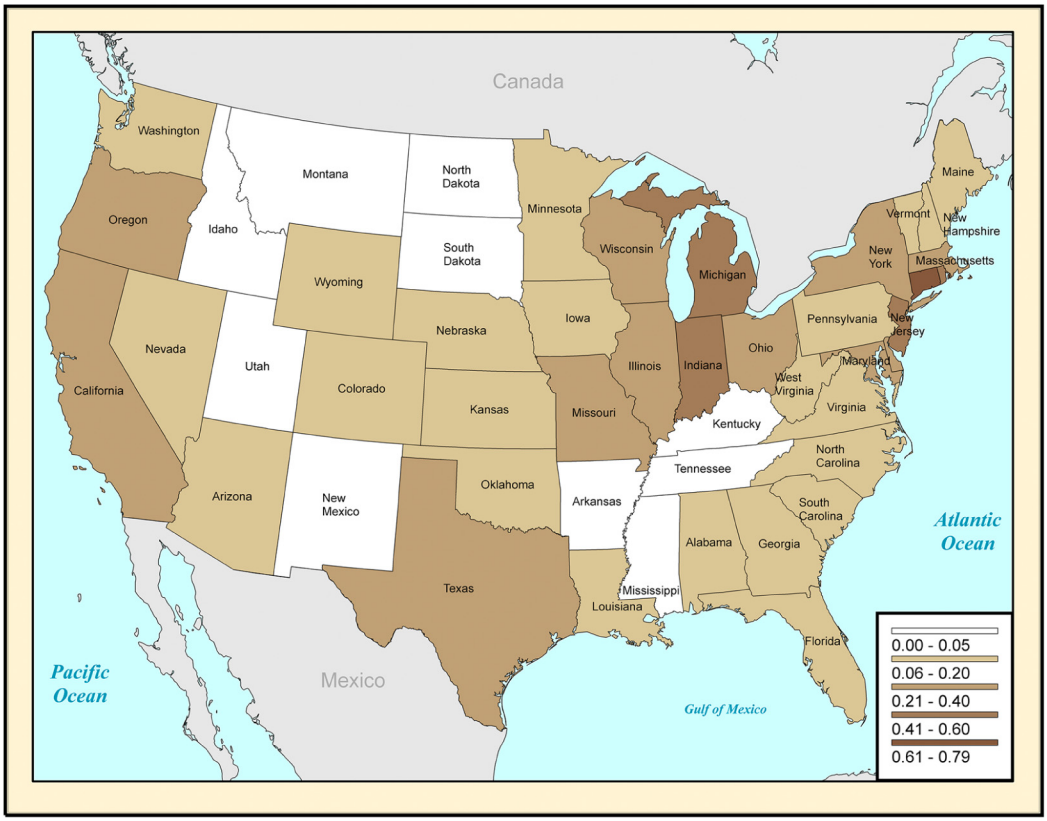
[9] As an example of the former, a fifth of all U.S. munitions (including most B-24 bombers, aircraft engines, tanks, and trucks) was made in automobile plants, with non-military car production shutdown in 1942. Foreshadowing results later in the paper, this production was widely dispersed (the automobile industry was spread over 44 states and 1375 cities). The agencies also had other powers. They centralized control of raw materials, and they also influenced the level of production. For example, in 1942 the commissions convinced military leaders to reduce their munitions demand from a level which would damage the country's long-term manufacturing capacity.

[10] It is unclear if having executives from manufacturing and retail firms head-up the various agencies created a self-dealing problem.

[11] Between 1939 and 1943, war-related jobs paid between 30–40% more per hour and 40–60% more in total annual compensation than non-war industries. The pay was also superior to manufacturing jobs overall, paying 15% more per hour and 20% more in annual compensation of the same period (U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, 1943).



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



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

Fig. 2. Contract spending per capita: periods of interest.

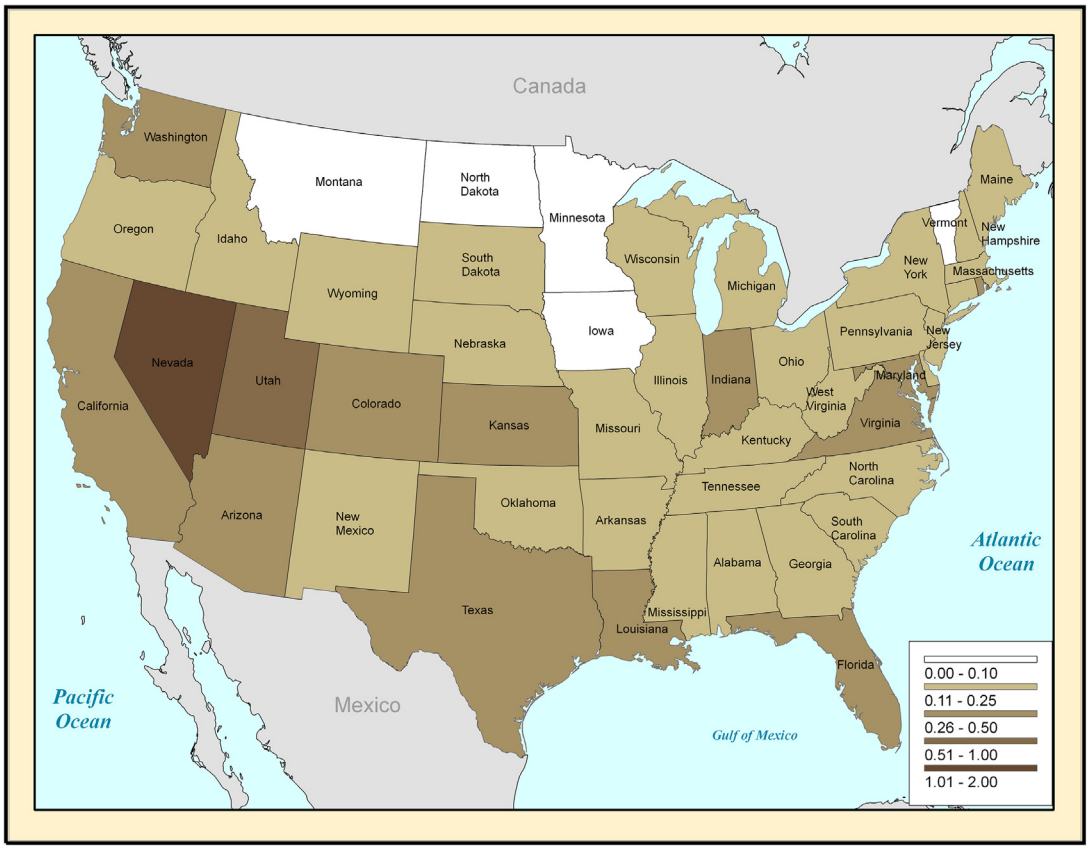


Fig. 3. New facilities spending per capita, 6/1940 thru 10/1944.

war in late 1941, and then started to taper off in 1944. The bottom rows show in the months leading up to the 1944 election that there was relatively little spending.

Fig. 2 maps the allocation of per-capita contract spending across states. Activity is concentrated in the Northeast, Midwest, and Pacific states. New facilities spending per capita (mapped in Fig. 3) is allocated somewhat differently—more is going to the South and Mountain West. Nevada stands out, where a large number of military bases (mainly army airfields) and mining facilities were built and the population was low.

Fig. 4 shows the distribution of the two key economic independent variables—total manufacturing employment per capita and aircraft manufacturing employment per capita—across the U.S. states. Two features stand out. First, manufacturing had important concentrations in the Northeast, the Industrial Midwest, and to a lesser extent the West Coast and portions of the South—the Carolinas, Georgia and Virginia (these points partly reflect the spatial distribution of the auto industry, see Footnote 9). Second, aircraft manufacturing employment was highly concentrated in a few states, reflecting the need for specialized labor and plants.

4. Pivotal states in the electoral college

We now turn to a formal model of election-motivated spending allocation decisions. We focus on how to distribute spending across states with the goal of maximizing the probability of winning the presidential election. This in turn is equivalent to determining which states have the highest return: spending there has the greatest chance of swinging the overall election winner which we will refer to as how "pivotal" each state is.

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.

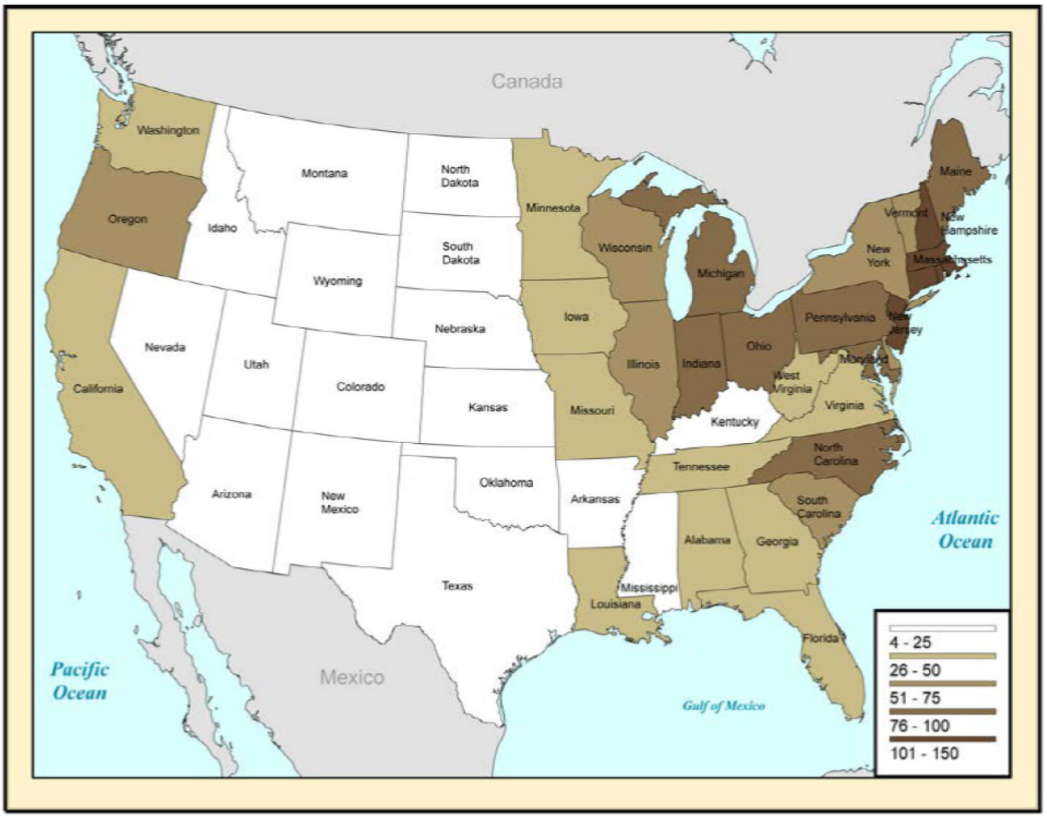
First, for each state we calculate the Democratic share of the two party vote in all elections for U.S. president, U.S. senator, and state governor that took place between 1932 and 1943.[12] Denote this by D_{ijt}, where i indexes states, j indexes offices, and t indexes years. Next we estimate the following model, using OLS:

$$D_{ijt} = \alpha_i + \theta_t + \epsilon_{ijt} \quad (1)$$

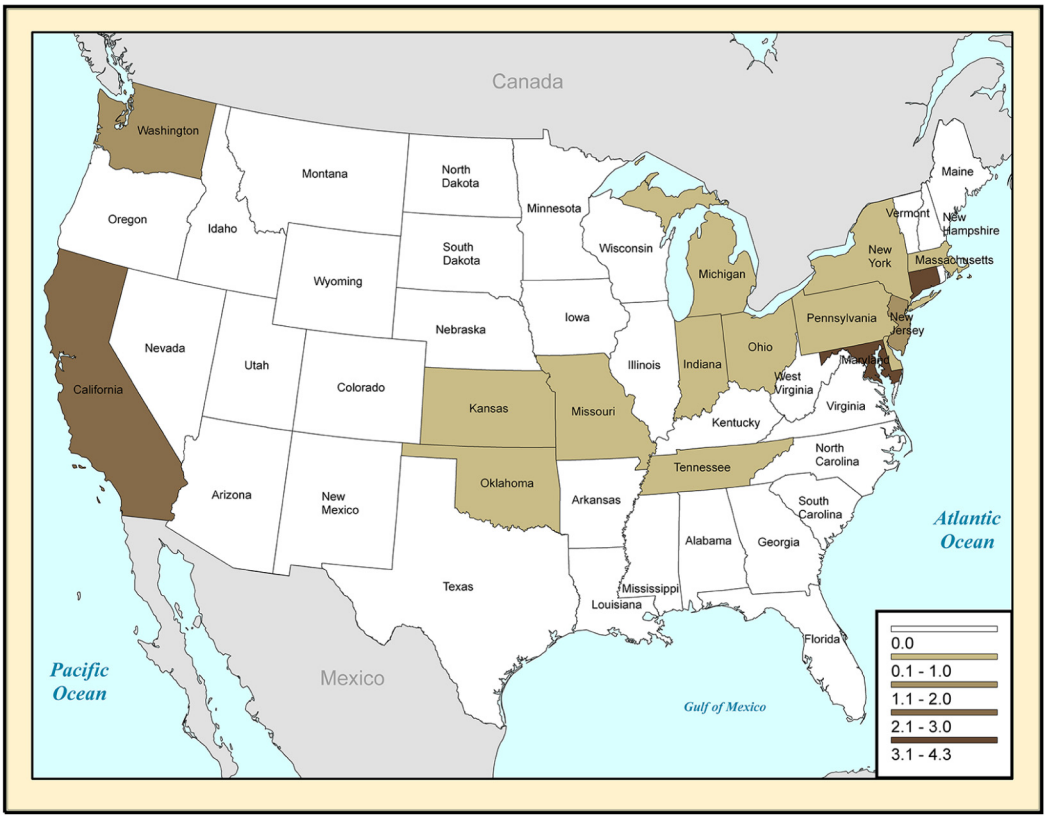
where α_i denotes a vector of state-specific fixed-effects and θ_t denotes a vector of year-specific fixed-effects (national shocks). This yields the "normal Democratic vote" in state i ($\hat{\alpha}_i$), and the "idiosyncratic electoral variability" in state i (standard deviation of the residuals $\hat{\epsilon}_{ijt}$ 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

[12] 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.



(a) Total Manufacturing Employment Per Capita, 1939



(b) Aircraft Manufacturing Employment Per Capita, 1939

Fig. 4. Pre-existing manufacturing employment.

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).[13]

The second is the effect of military spending on the share of votes won by the Democrats in 1944. As shown in Table 1, the standard deviation of contract spending per capita was about $1000, and the average was also about $1000. 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).[14]

For each choice of these parameters—discussed shortly—we simulate 1 million elections, as follows (steps (i) through (iv) summarize a single election iteration):

(i) Draw an idiosyncratic shock η_i for each state i from a distribution that is $N(0, (D_i^{sd})^2)$.
(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):

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

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

(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 $V^m \times (2{,}700{,}000/P_i)$ 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*.[15]
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 a time, and subtract $V^m \times (2{,}700{,}000/P_i)$ from V_i 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 $\textit{Pivot Probability}_i$ be the fraction of times that state i is *Pivotal* out of the 1 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, $D^N \in \{-.03, 0, .03\}$.

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 the Appendix (Section C). In that section we consider two versions of spending (cumulative and per year) as well as four versions of individual-level Gallup data vote change (omitting and including previous non-voters, and vote intention versus vote approval). For the World War Two spending (Table C.2) the average imputed V^m value is 0.012 with a maximum of 0.041. For New Deal spending (Table C.3) 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. This implies a relatively modest impact of spending on voting.[16]

We consider $V^m \in \{.01, .02, .03, .04, .06, .08, .10, .12, .15, .20, .25\}$. 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 33 separate simulations, one for each combination of D^N ($\times 3$) and V^m ($\times 11$).

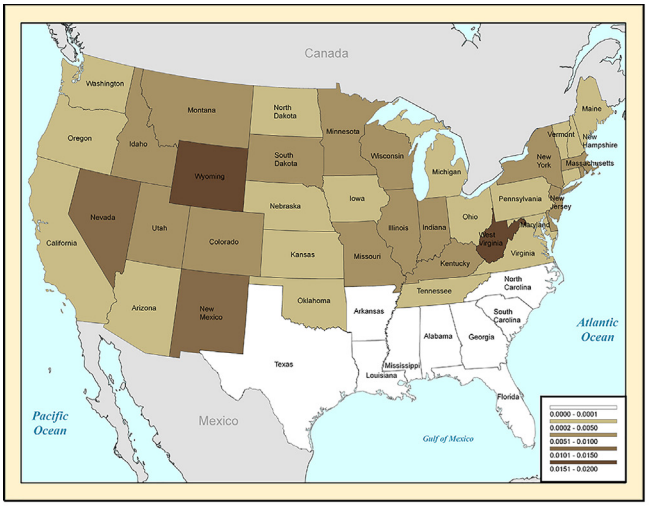
Panels a–d in Fig. 5 show how the pivot probabilities vary across states, for four values of V^m: .01, .03, and .06 ("reasonable" values), and .20 (probably implausibly large). The maps suggest that the pivotal probabilities are plausible. While the probabilities vary with V^m, the ordering of the states is relatively stable (while not shown here, they are also stable over D^N).[17] States with high pivot probabilities—such as New York, West Virginia, Illinois, Indiana, and Missouri—are those which are not strongly aligned with one party, while those with pivot probabilities of zero—North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Texas—tilt heavily towards Democrats. In fact, the states of the Solid South are essentially never pivotal.

The results also differ from 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 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).[18] A more formal comparison of the pivot probability and some leading alternatives from the literature is presented in Appendix D (pivot probabilities are highly correlated with a revealed-preference measure of candidate ranking—the number of presidential campaign visits to each state—and this correlation is also markedly higher than with the other measures).

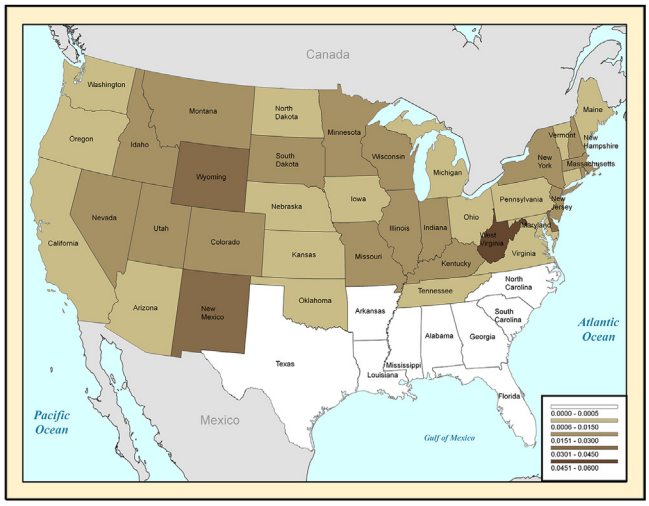
5. Main results on spending

This section presents the main estimates explaining the spatial distribution of spending across states. The focus is on determining the relative contributions of distributive political forces and economic efficiency mechanisms. This section concentrates on presidential election concerns. In Appendix E.3 we consider the role of Congressional influence. The results suggest that tactical distributive politics play almost no role in explaining the spending allocations, and that economic efficiency is important both relative to distributive politics and also in absolute terms.

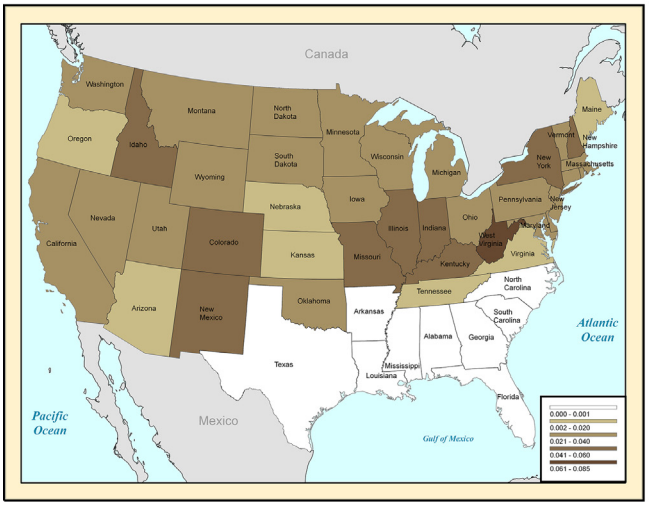
[13] This is akin to the fixed effect θ_t from the estimates of Eq. (1), but those values cannot be used because they are for earlier periods.
[14] Note that V^m takes on two roles: it measures both vote sensitivity to money and the amount of spending. That is, doubling its value could mean the amount 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.
[15] Note that for state i to be pivotal, two changes must occur. First, $V_i + V^m \times (2{,}700{,}000/P_i)$ must be 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.
[16] The top panel of Table C.2 suggests that if all of the war spending arrived in one burst, then the effect on Roosevelt's approval would only be about half as large as the "rally around the flag" increase which followed the Japanese attack on Pearl Harbor (see Fig. 6).
[17] Note that the categories in the maps have higher values as V^m increases. When this parameter is larger states are more likely to be pivotal, since spending is more likely to change their vote outcome.
[18] Volatility is the residual standard error from Eq. (1).



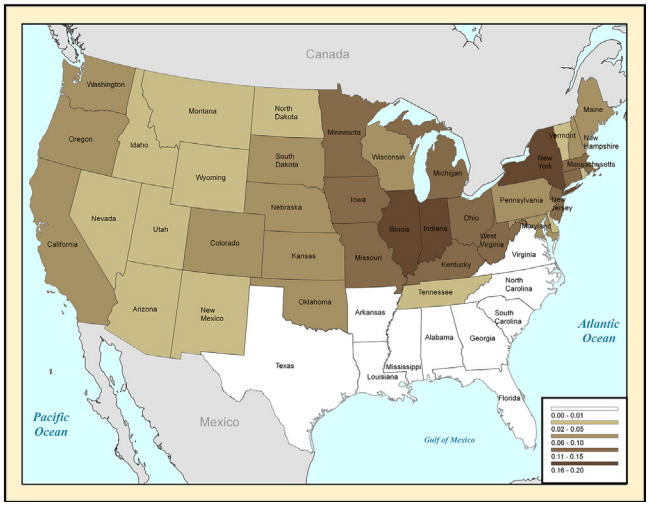
(a) Pivot Probabilities for $V^m = .01$, Neutral Tide ($D^N = 0$)



(b) Pivot Probabilities for $V^m = .03$, Neutral Tide ($D^N = 0$)



(c) Pivot Probabilities for $V^m = .06$, Neutral Tide ($D^N = 0$)



(d) Pivot Probabilities for $V^m = .20$, Neutral Tide ($D^N = 0$)

Fig. 5. Estimated Pivot Probabilities.

5.1. Motivation

A helpful initial step is to visually inspect the maps of the key variables. Fig. 2 showed that contract spending was concentrated in certain regions (Appendix E.1 shows this ranking is relatively stable over time). While these patterns could reflect a politically motivated allocation since many of these states have high pivot probabilities (Fig. 5), there are important deviations. For example, West Virginia is pivotal but it does not receive extraordinary spending. New England, Upper Midwest, Plains and West Coast states receive substantial spending and yet are not particularly pivotal. And then there is the South, which is never pivotal, and yet receives spending. Economic efficiency is a more consistent explanation for the allocation pattern. High spending states all have significant pre-existing industrial capacity (Fig. 4). In particular, economics can explain the politically anomalous cases of high spending in less pivotal states (New England, Upper Midwest and Plains, West Coast, and South) and low spending in pivotal states (West Virginia). It is also unlikely that political calculus drove the allocation of new facilities spending. Facilities spending, mapped in Fig. 3, is far less lumpy than the pivot probabilities (Fig. 5).

Fig. 6 shows the temporal pattern of aggregate national spending per capita and voter support for FDR (Roosevelt) during the period between the 1940 and 1944 elections (Appendix A.2 presents the spending time series annotated with key war events. FDR approval data is from Gallup). 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 politically 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 appeared to be most vulnerable electorally and so a politically-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

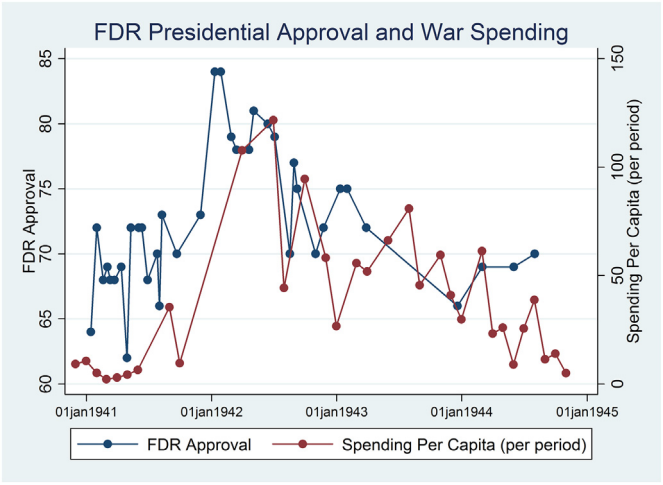


Fig. 6. FDR approval and contract spending, 1941–1944.

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, the patterns suggest that 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.[19]

5.2. Estimates: contract spending

We now estimate the contributions of presidential-motivated politics and economic efficiency in explaining the distribution of war spending. Our political measure is based on whether spending in a state is likely to alter its election and then in turn change the overall winner, the pivot probability discussed in the last section. This subsection focuses on the allocation of contract spending, which is the bulk of the war monies (about 86% of federal spending on the war), and the next subsection considers new facilities spending.

We focus on the following cross-sectional model,

$$Spending_i = \beta_0 + \beta_1 Pivot\ Probability_i + \beta_2 Total\ Manuf_i + \beta_3 Aircraft\ Manuf_i + \epsilon_i \quad (2)$$

where i represents states.[20] We estimated several versions of this specification using OLS, based on different time periods and constructions of the variables. The goal is to compare the economic and statistical significance of the political and economic channels (β_1 versus β_2, β_3) and their contribution to explaining the variation in monies across states (using R^2). For each type of spending, we consider various measures for *Spending*. To measure the distributive political factors we consider each of the 33 separate *Pivot Probability* vectors, representing different assumptions about voter responses to spending and of the aggregate partisan leanings of the electorate, discussed in the last section. The *Manuf* covariates—total (*Total Manuf*) and aircraft (*Aircraft Manuf*) employment per capita in 1939—are measures of pre-existing (pre-war) manufacturing capacity that capture the role of economic efficiency. To ease interpretation we standardize both the dependent variable and the covariates to have mean 0 and standard deviation 1, that is for each variable we subtract the mean (which 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. After this change, the parameters indicate the standard deviation change in the dependent variable from a one standard deviation change in the covariate. We present our estimates graphically in order to show several specifications at once, with some of the underlying estimates in Appendix Section E.2.

For completeness, the figures present estimates for a wide range of V^m values. We argued in the last section that values less than .08 are most plausible, while higher values are not consistent with the estimated relationship between spending and votes. Therefore, our discussion focuses on the most realistic V^m values. In addition, the less plausible values are graphed using a lighter color.

Fig. 7a shows the point estimates for total per-capita spending from June 1940 thru November 1944, that is, up to the 1944 presidential election, for each of the different values of the money shift parameter V^m and for $D^N = 0$ (neutral national tide).[21] Fig. 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*. Fig. 7c shows the point estimates and 95% confidence intervals for the *Pivot Probability* variable, for the same specifications. Fig. 7d shows the point estimates and 95% confidence intervals for the *Total Manuf* variable, for the same specifications.

The patterns are clear. Recall that we standardized all variables. So, Fig. 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. Fig. 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. Fig. 7c shows that the estimated effect of *Pivot Probability* is not statistically significant at the .05 level even for rather high values of V_m. By contrast, Fig. 7d shows that the estimated effect of *Total Manuf* is always highly significant at the .05 level.

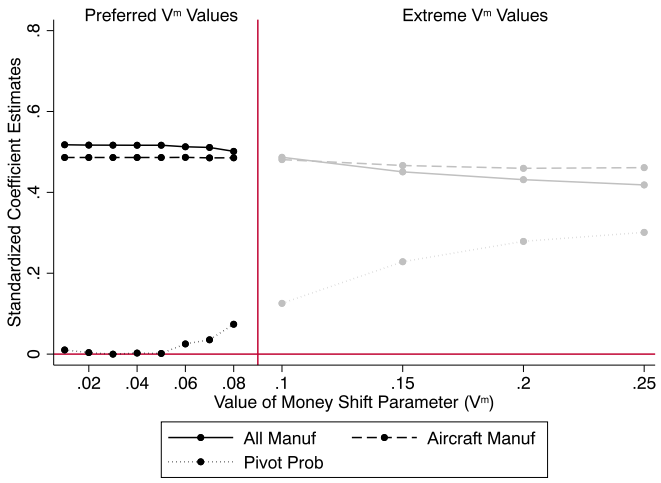
It is possible that although overall spending was not clearly targeted at pivotal states, spending closer to the election of 1944 was. In fact, this is not the case.[22] Panels a–d in Fig. 8 are analogous to panels a–d in Fig. 7, but the dependent variable is for contract spending only in 1944 (January through October). The overall patterns are quite similar: the estimated effect of the *Total Manuf* variable is much higher than the estimated effect of the *Pivot Probability* variable (though this is no 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

[19] An alternate to using presidential support is to look at the partisan composition of Congress. Following the 1940 election the Senate was 68% and the House 61% Democratic. After the 1942 mid-term elections, the Senate and House Democratic share had fallen to 61% and 51% respectively. This suggest a larger drop in voter support than in the figure, which makes the continuing drop in war spending harder to reconcile with an election-based calculus.

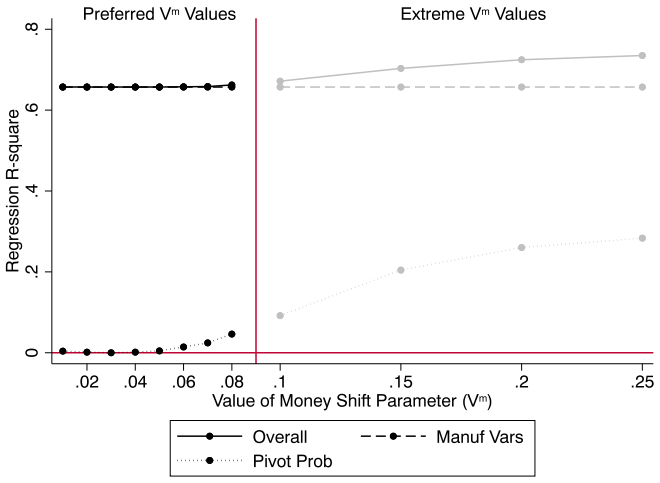
[20] We also estimated several alternative models (which are omitted here for brevity). First we consider a specification that included pre-existing shipbuilding capacity. However, this variable is never statistically significant, and including it does not affect the other coefficients. Second, to the extent possible military production was supposed to be located where it could not easily be attacked by enemy forces. Thus, we also estimated models that included dummy variables indicating coastal states and border states. These variables were never positive and statistically significant. Third, we use other measures in the political economy literature (Appendix D)—*Political Productivity* or *Electoral Vote Competition*—in place of *Pivot Probability*. The estimated coefficients for these variables are never statistically significant while the estimated coefficients for the manufacturing variables, *Total Manuf* and *Aircraft Manuf*, remain large and highly significant. Fourth, we dropped the South (the eleven former Confederate states) and the patterns are similar.

[21] In the interest of brevity we do not present the estimates for $D^N = .03$ (pro-Democrat national leaning) or $D^N = -.03$ (anti-Democrat national leaning). The pattern of results reported below continue to hold in those cases.

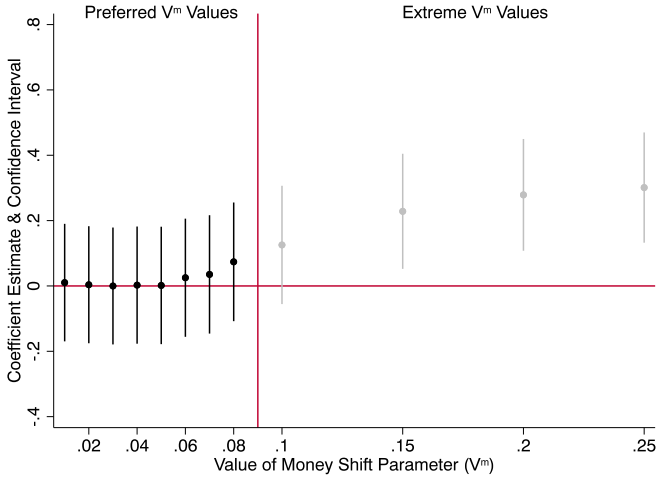
[22] As further evidence, recall from Table 1 that little spending occurs right before the election.



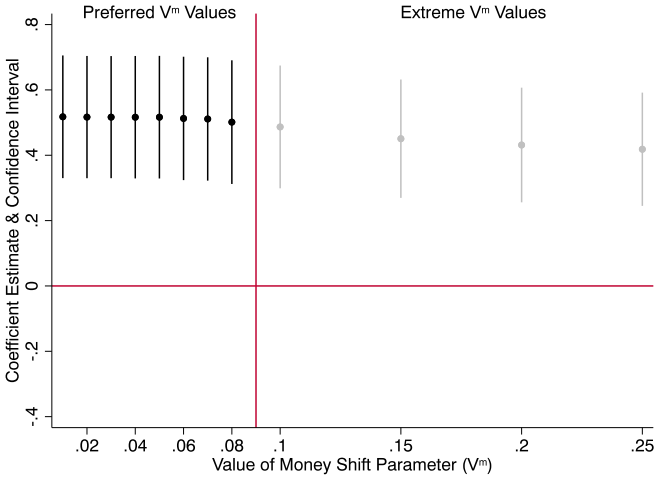
(a) Estimated Effects of Pivot Probability and Manufacturing on Per Capita Spending, 6/1940 thru 10/1944, Neutral Tide ($D^N = 0$)



(b) Estimated R-square of Regressions on Per Capita Spending, 6/1940 thru 10/1944, Neutral Tide ($D^N = 0$)



(c) Estimated Effect of Pivot Probability on Per Capita Spending, 6/1940 thru 10/1944, Neutral Tide ($D^N = 0$)



(d) Estimated Effects of Total Manufacturing on Per Capita Spending, 6/1940 thru 10/1944, Neutral Tide ($D^N = 0$)

Fig. 7. Contract spending: through 1944 election.

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.

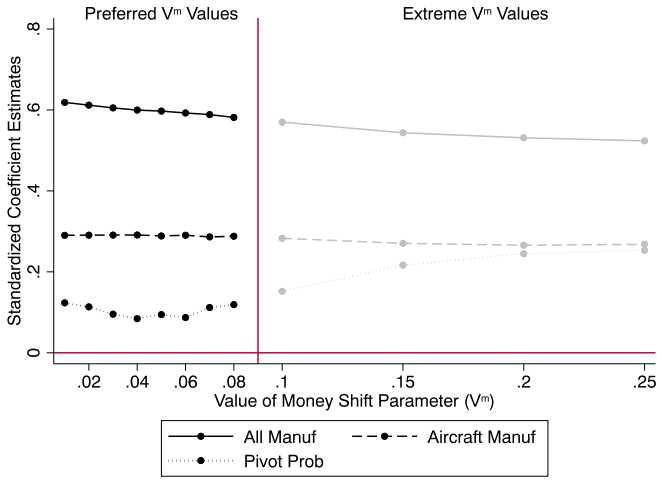
Panels a–d in Fig. 9 zero in even closer to the election, examining the distribution of contract spending in the four months just prior to the election—July thru October 1944.[23] The bottom line is again the same. There is little evidence that contracts were allocated disproportionately towards pivotal states in the run-up to the election.[24]

For what levels of V^m is the estimated effect of *Pivot Probability* statistically or economically meaningful? Consider total contract spending per capita over the war. The coefficient on *Pivot Probability* becomes statistically significant only for values of V^m greater than 0.13, which is in the range of values that seem implausibly large. The same is true for total contract spending per capita in 1944. In terms of magnitudes, we might argue that the estimated effect of *Pivot Probability* is "economically significant" when, say, it is at least 1/4 as large as the estimated effect of the *Total Manuf* variable. This occurs only for values of V^m greater than 0.11 or 0.12, again implausibly large.

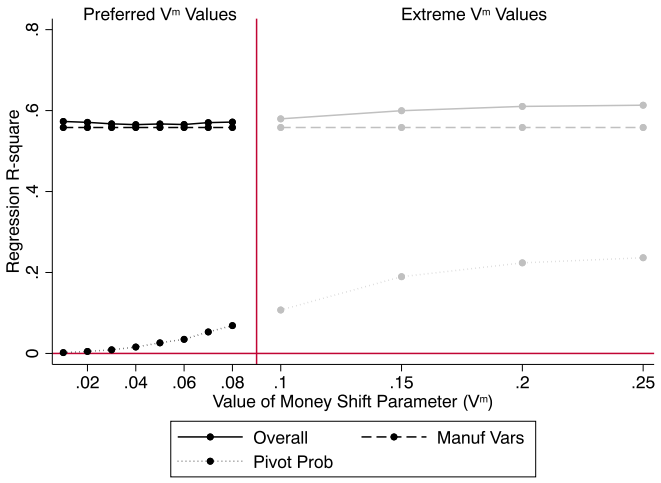
Finally, panels a–d in Fig. 10 search for evidence of electorally-related targeting from a slightly different point of view, by studying the share of money spent in a state during the 2 or 4 months prior to the election, as a percentage of the total amount of money spent in the state over the whole war, or over the whole year 1944. In all figures we focus on the estimated coefficient and standard error of *Pivot Probability*. Panels a and b in Fig. 10 consider the 4-month period leading up to the November 1944 election (July through October), while panels c and d in Fig. 10 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.

Overall, we find robust evidence that war contract spending is not allocated to enhance the president's electoral chances. Economic efficiency is a far more important determinant. Moreover, economics is

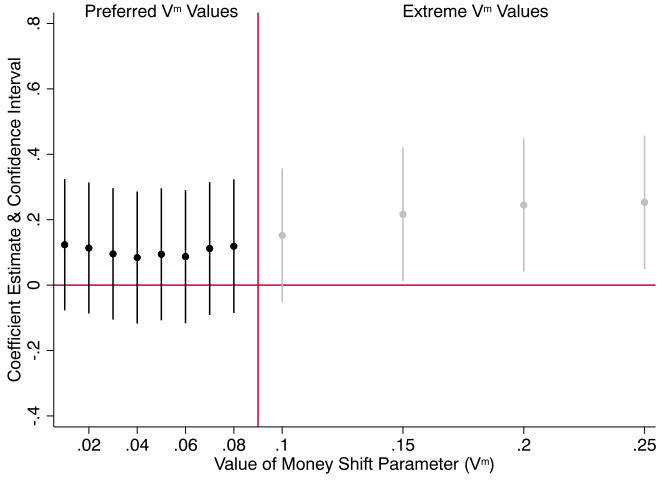
[23] In these regressions we drop the *Aircraft Manuf* variable.
[24] Other intervals, two, three, or five months leading up the election exhibit similar patterns.



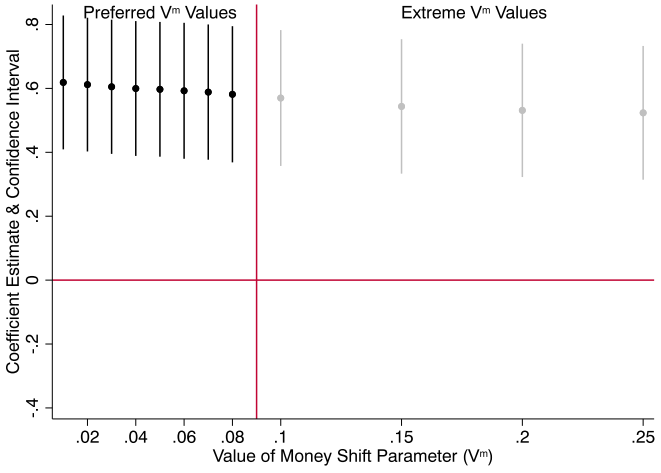
(a) Estimated Effects of Pivot Probability and Manufacturing on Per Capita Spending, 1/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(b) Estimated R-square of Regressions on Per Capita Spending, 1/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(c) Estimated Effect of Pivot Probability on Per Capita Spending, 1/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(d) Estimated Effects of Total Manufacturing on Per Capita Spending, 1/1944 thru 10/1944, Neutral Tide ($D^N = 0$)

Fig. 8. Contract spending: 1944, prior to election.

important in absolute terms and just one variable (pre-existing manufacturing capacity) can explain 60% of the inter-state variation in such spending.

5.3. Estimates: new facilities spending

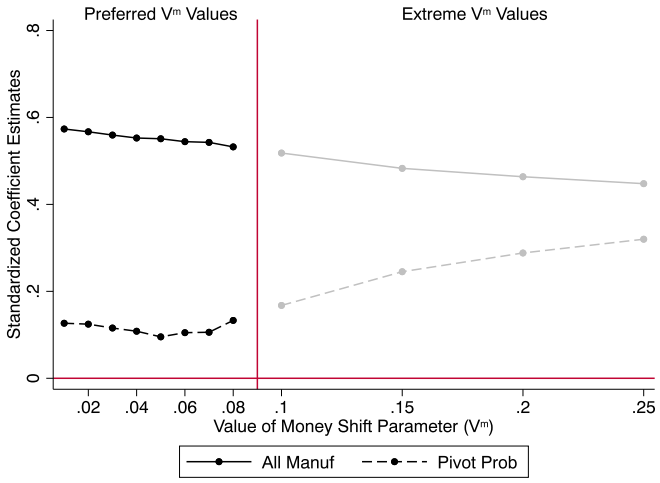
We next turn to new facilities spending, both military and industrial. Such spending is more amenable to geographic political manipulation than supply contracts, since it does not depend on pre-existing factors, like manufacturing plants, which might not be coterminous with political needs.[25] Facilities spending should be easier to geographically target to politically beneficial states than contract spending which is tied to pre-existing manufacturing capacity. Given this, the far smaller scale of facilities spending—14% of federal spending on the war—is *prima facie* evidence against the role of political factors.

We analyze the allocation of new facilities spending and also total spending on supply contracts plus facilities. We show results for spending over the whole war and spending just in the election year. The key results are shown in Fig. 11a–d. The bottom line is again simple. With facilities spending as the dependent variable the estimated coefficient on the *Pivot Probability* variable is always small and in most specifications negative (see Fig. 11a and b). In most cases the estimate is statistically insignificant, and it is significant only when the point estimate is negative. This is true whether or not the *Total Manuf* and *Aircraft Manuf* variables are included (the latter results are not shown in the figure). The manufacturing variables are never statistically significant. Thus, new facilities were not placed disproportionately near existing manufacturing areas, nor does it appear that they were used to develop under-developed areas.

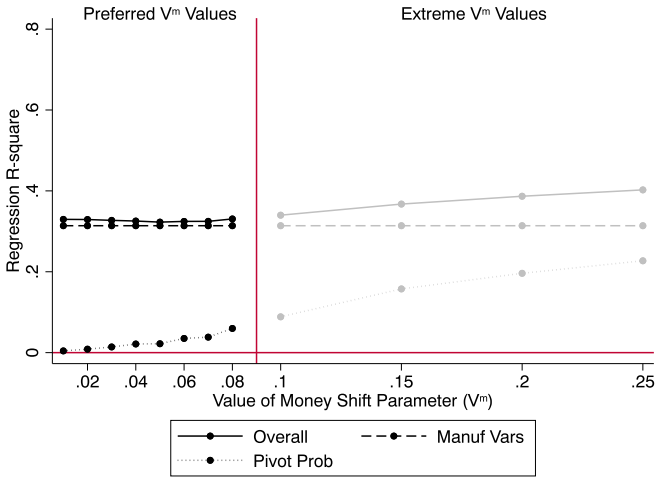
Note that none of the variables in our models strongly predict the geographic distribution of new facilities spending. This is a puzzle that we leave for future research.

With total spending (contracts plus new facilities) per capita as the dependent variable the results are, not surprisingly, similar to

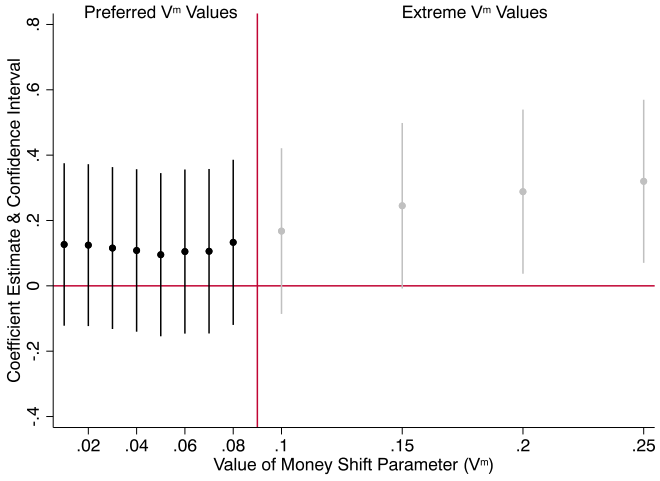
[25] While one might imagine that new facilities would have to be located near up- and down-stream suppliers, there are many examples of plants located virtually in the middle of nowhere. Some leading examples include the Basic Magnesium plant set up in Henderson, Nevada, and the Manhattan project plants constructed in Clinch River, TN and Los Alamos, NM.



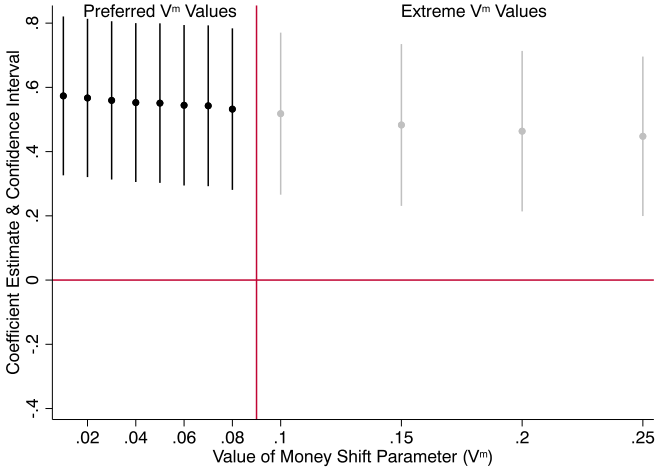
(a) Estimated Effects of Pivot Probability and Manufacturing on Per Capita Spending, 7/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(b) Estimated R-square of Regressions on Per Capita Spending, 7/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(c) Estimated Effect of Pivot Probability on Per Capita Spending, 7/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(d) Estimated Effects of Total Manufacturing on Per Capita Spending, 7/1944 thru 10/1944, Neutral Tide ($D^N = 0$)

Fig. 9. Contract spending: four months before 1944 election.

those for contract spending alone (see Fig. 11c and d). For the more plausible values of V^m the estimated coefficient on the *Pivot Probability* variable is small and statistically insignificant.[26] As with the regressions for supply contracts in the previous section, the manufacturing variables are always positively related to total spending and statistically significant.

6. 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 a preference for continuity.

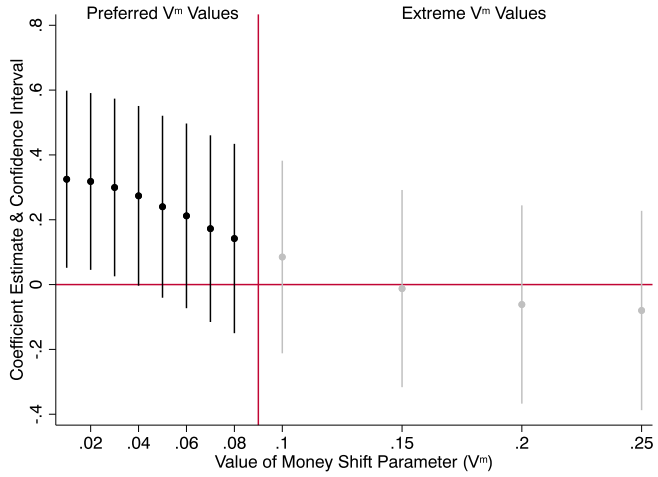
We consider two aspects of this mechanism: how perceptions of the war status influence votes, and how the party in power is perceived to influence the status of the war. Both of these topics can be analyzed using questions from the Gallup polls (discussed in Appendices B.2, C).[27]

The results (cross-tabs) are summarized in Table 2.[28] The first values look at how voter behavior is related to beliefs about the war status. We use the Gallup polls which asked voters how they would

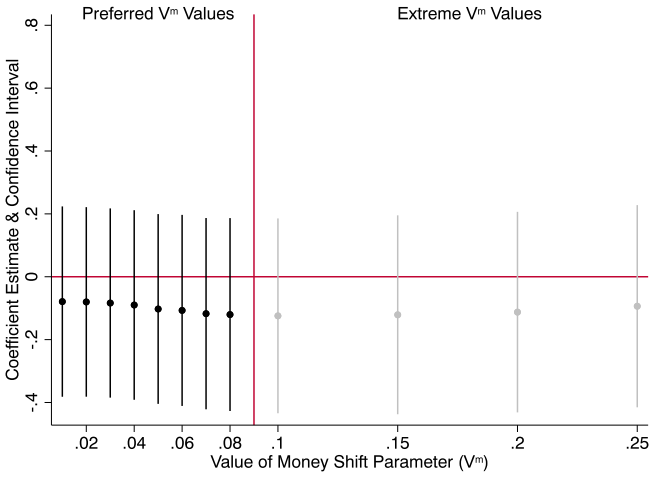
[26] For very high values of V^m the estimated coefficient is larger and statistically significant at least when the *Total Manuf* and *Aircraft Manuf* variables are excluded (the latter results are not shown in the figure).

[27] 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.

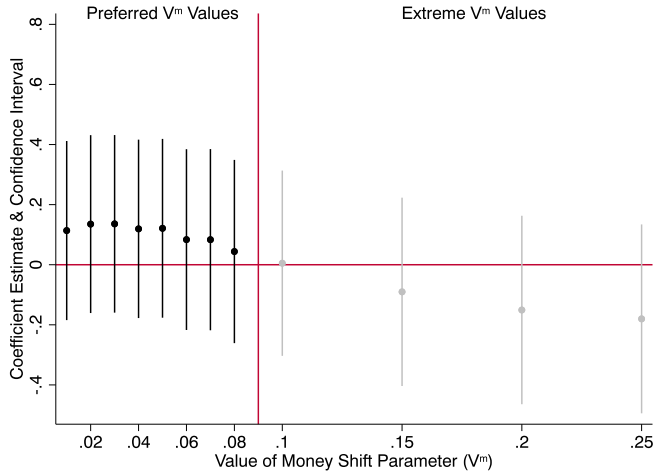
[28] An implicit assumption in the analysis is that the poll questions refer to favorable war outcomes: "war ending" and "speedier prosecution of the war" implies the Allies are victorious. This is a reasonable assumption given the context of relevant Gallup polls.



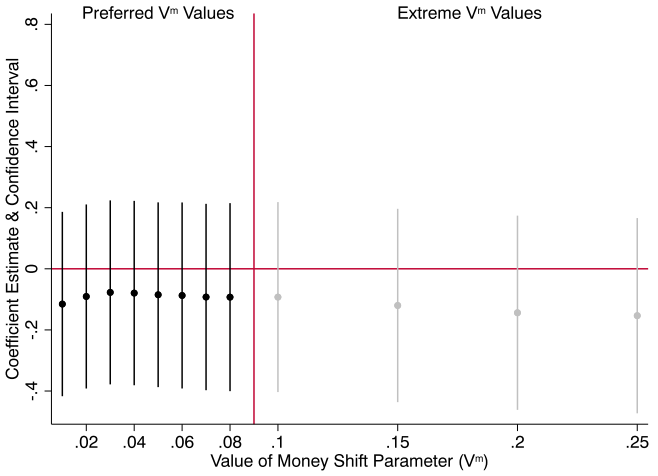
(a) Estimated Effects of Pivot Probability on Pct of Total Spending for War Spent 7/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(b) Estimated Effects of Pivot Probability on Pct of Total Spending for 1944 Spent 7/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(c) Estimated Effects of Pivot Probability on Pct of Total Spending for War Spent 9/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(d) Estimated Effects of Pivot Probability on Pct of Total Spending for 1944 Spent 9/1944 thru 10/1944, Neutral Tide ($D^N = 0$)

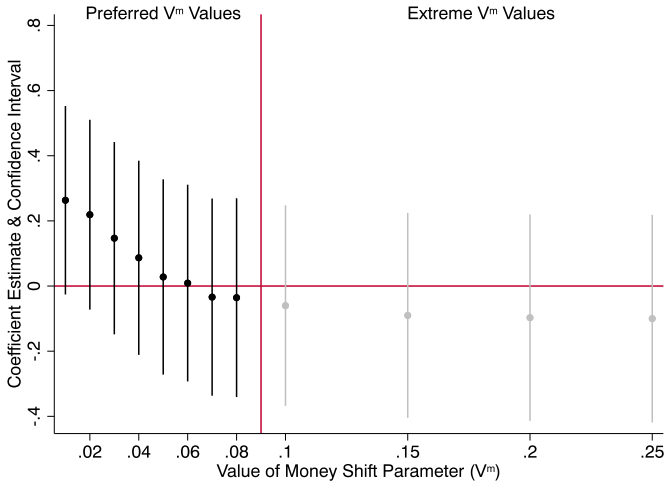
Fig. 10. Contract spending: percent of spending four or two months before 1944 election.

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 Republican in the 1940 election.

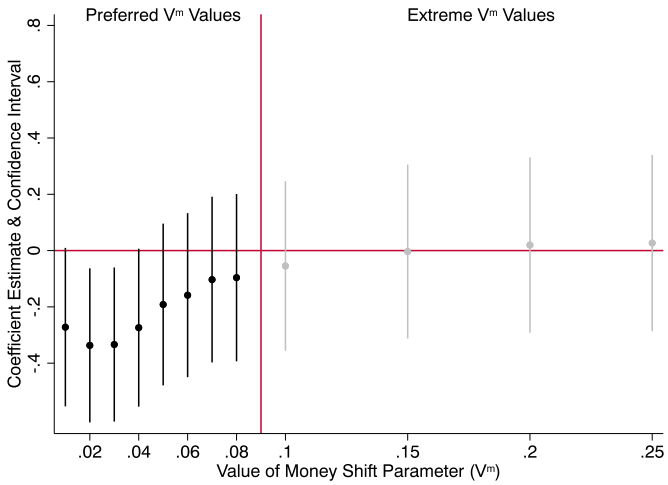
One challenge of interpreting these estimates is that there are two reasons that the war status could influence voter support for the president. A standard argument is that voters prefer continuity in their politicians so long as the war is continuing, and are more open to a change in peace time. But the counter-argument is that 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 end sooner.

Table 3 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 comfortable in FDR's performance.[29]

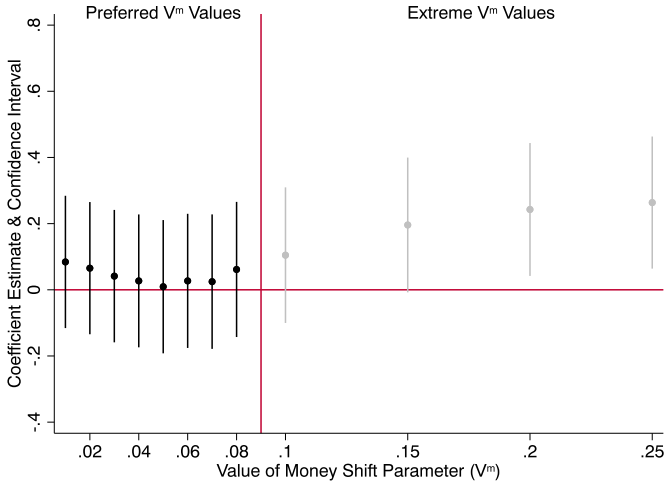
[29] Further support for this comes from The Office of Public Opinion Research (OPOR) which ran a number of surveys during the war. One survey (No. 6) conducted April 2–7, 1943 included questions on whether the individual would support FDR for a fourth term if the war were over, whether he or she recalled 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).



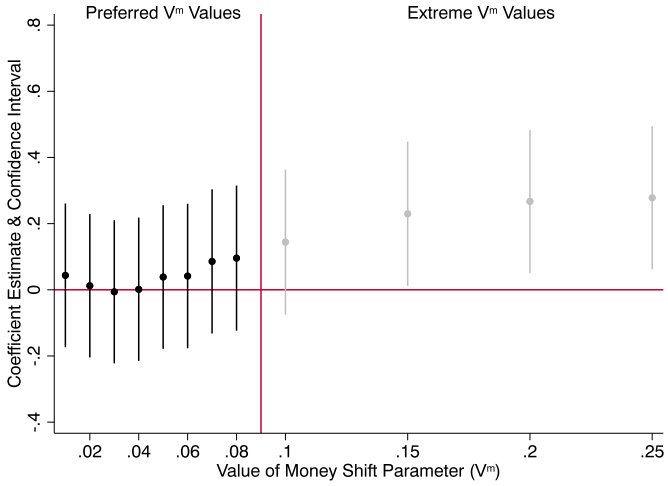
(a) Estimated Effect of Pivot Probability on Per Capita New Facilities Spending, 6/1940 thru 10/1944, Neutral Tide ($D^N = 0$)



(b) Estimated Effect of Pivot Probability on Per Capita New Facilities Spending, 1/1944 thru 10/1944, Neutral Tide ($D^N = 0$)



(c) Estimated Effect of Pivot Probability on Per Capita Total Spending, 6/1940 thru 10/1944, Neutral Tide ($D^N = 0$)



(d) Estimated Effect of Pivot Probability on Per Capita Total Spending, 1/1944 thru 10/1944, Neutral Tide ($D^N = 0$)

Fig. 11. New facilities and total spending: through 1944 election.

7. Conclusion

Our empirical results fit together in a consistent mosaic. 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. We also find little relationship between pivotality and spending on new facilities. We also find little evidence that spending that successfully impacts the war effort is likely to directly translate into additional votes. Thus, the evidence suggests that the distribution of World War Two spending was driven more by practical concerns than by calculations of how to win future elections.

In some ways our results might be expected, but in other ways they are surprising. Given the threat to western democracies, one would expect that war monies would be allocated as efficiently as possible. On the other hand, political influence might not noticeably diminish the chance of winning the war but rather delay it. Inefficient spending—for example, building new facilities in a politically valuable location rather than in the most productive location—does not imply that materiels are not made, just that it will take longer. We know various offensives were postponed until adequate munitions were made, most famously the D-Day invasion which was delayed until adequate landing ships could be manufactured. Given the possible trade-off—political gains against the costs of a delayed victory in the war—and the vast sums of monies involved, one might expect that politics would influence the allocation of war spending at least on the margin. A priority going forward is to determine conditions which diminish political influence over allocations. Some leading possibilities include high stakes spending (fighting a significant threat to national security rather than, say, infrastructure spending), external oversight (the civilian advisors in the programs discussed above), crowd-out (some government spending displaced private manufacturing, such as the full conversion of civilian auto plants to wartime use, and voters respond to the

Table 2
Voting conditional on war status.

	Conditional FDR vote			
	Vote given	Vote given	# observations	
	War continue	War over	War continue	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	# obs.
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 given			△Vote given			# observations	
	1940 vote = FDR			1940 vote = Willkie			1940 vote=	
	−1	0	+1	−1	0	+1	FDR	Willkie
1/28/1943–2/3/1943	4.8%	84.0%	11.2%	1.9%	82.0%	16.1%	437	372
5/14/1943–5/20/1943	0.7%	63.4%	35.8%	0.2%	87.6%	12.2%	547	428
3/31/1943–4/4/1944	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 Given War Continue − Vote Given 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 (Section B.2) lists the specific Gallup polls which are used.

net change in public plus private production), or specific environmental factors (voters might be less responsive to spending in the midst of a war than, say, during a depression).

There are several avenues to further explore World War II spending. First, it is possible that other political factors were at play, including inter-party competition for control of Congress, re-election concerns of individual congressional incumbents, or allocating funds and new plants to areas where Democrats had more supporters to reward loyalists and increase turnout of friendly voters. To do this resources would have to be steered to the jurisdictions of individual congressmen or specific areas in the state. Similarly, one could generate local measures of pivot probabilities with respect to presidential, gubernatorial or Senate elections to examine the within-state allocation of war spending. Second, another objective of the war spending

Table 3
Speed of ending the war conditional on having a GOP government.

	△War speed			
	−1	0	+1	# obs.
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 given			△War speed given			# observations	
	1940 vote = FDR			1940 vote = Willkie			1940 vote=	
	−1	0	+1	−1	0	+1	FDR	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 (Section B.2) lists the specific Gallup polls which are used.

was to locate plants where they could not easily be attacked by enemy forces. This would push spending far from borders and coasts, both between and within-states. Third, we could examine a more localized measure of the economic incentive to allocate spending. Proximity to pre-war military bases, pools of under-employed and unemployed workers, all might increase the efficacy of such spending. Finally, what were the long-term consequences of such extensive federal spending? One could examine whether this led to higher levels of income or industrial development say twenty or thirty years later (a challenge would be to account for the endogeneity of such spending, since we have seen it tends to be located near pre-existing manufacturing plants). This would contribute to the growing literature which seeks to measure such local multipliers of government programs, but typically must consider far smaller outlays. A careful investigation of each of these topics requires more fine-grained data (spending at the congressional district or county level), and we leave this for future work.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpubeco.2018.08.010.

References

Bateman, F., Taylor, J.E., 2003. Was "V" for victory or votes? A public choice analysis of World War II federal spending. Public Choice 114 (1/2), 161–174.

Battaglini, M., Coate, S., 2008. A dynamic theory of public spending, taxation, and debt. Am. Econ. Rev. 98 (1), 201–236.

Besley, T., Persson, T., 2009. The origins of state capacity: property rights, taxation and politics. Am. Econ. Rev. 99 (4), 1218–1244.

Cardona, D., Rubí-Barceló, A., 2013. On the optimality of bargaining outcomes in the collective-particularistic multilateral bargaining game. DEA Working Papers 53. Universitat de les Illes Balears, Departament d'Econ omía Aplicada.

Colantoni, C.S., Levesque, T.J., Ordeshook, P.C., 1975. Campaign resource allocations under the electoral college. Am. Polit. Sci. Rev. 69 (1), 141–154.

Dixit, A., Londregan, J., 1995. Redistributive politics and economic efficiency. Am. Polit. Sci. Rev. 89, 856–866.

Dixit, A., Londregan, J., 1996. The determinants of success of special interests in redistributive politics. J. Polit. 58, 1132–1155.

Fishback, P.V., Kantor, S., Wallis, J.J., 2003. Can the New Deal three Rs be rehabilitated? A county-by-county, program-by-program analysis. Explor. Econ. Hist. 40, 278–307.

Fleck, R.K., 1999. Electoral incentives, public policy, and the new deal realignment. South. Econ. J. 65 (3), 377–404.

Huang, T., Shaw, D.R., 2009. Beyond the battlegrounds? Electoral college strategies in the 2008 presidential election. J. Polit. Market. 8 (4), 272–291.

Lane, F.C., 1947. 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. GPO, Washington, DC.

Larcinese, V., Rizzo, L., Testa, C., 2006. Allocating the US federal budget to the states: the impact of the president. J. Polit. 68, 447–456.

Larcinese, V., Snyder, J.M., Jr, Testa, C., 2013. Testing models of distributive politics using exit polls to measure voter preferences and partisanship. Br. J. Polit. Sci. 43, 845–875.

Leblanc, W., Snyder, J.M., Jr, Tripathi, M., 2000. Majority-rule bargaining and the under provision of public investment goods. J. Public Econ. 75 (1), 21–47.

Lindbeck, A., Weibull, J.W., 1987. Balanced-budget redistribution as the outcome of political competition. Public Choice 52 (3), 273–297.

Lizzeri, A., Persico, N., 2005. A drawback of electoral competition. J. Eur. Econ. Assoc. 3, 1318–1348.

McCarty, N.M., 2000. Presidential pork: executive veto power and distributive politics. Am. Polit. Sci. Rev. 94 (1), 117–129.

Nagler, J., Leighley, J., 1992. Presidential campaign expenditures: evidence on allocations and effects. Public Choice 73 (3), 319–333.

Primo, D.M., Snyder, J.M., Jr, 2008. Distributive politics and the law of 1/n. J. Polit. 70 (2), 477–486.

Rhode, P., 2000. The impact of world war two spending on the california economy. In: Lotchin, R. (Ed.), The Way We Really Were: The Golden State in the Second Great War. University of Illinois Press, Urbana, IL, pp. 93–119.

Rhode, P., Strumpf, K., 2004. Historical presidential betting markets. J. Econ. Perspect. 18 (2), 127–141.

Rhode, P.W., Snyder, J.M., Jr, Strumpf, K., 2017. The arsenal of democracy: production and politics during WWII. Working Paper 24158. National Bureau of Economic Research.,

Shaw, D.R., 2006. The Race to 270: The Electoral College and the Campaign Strategies of 2000 and 2004. University of Chicago Press, Chicago.

Snyder, J.M., Jr, 1989. Election goals and the allocation of campaign resources. Econometrica 57, 637–660.

Strömberg, D., 2004. Radio's impact on public spending. Q. J. Econ. 119, 189–221.

Strömberg, D., 2008. How the electoral college influences campaigns and policy: the probability of being Florida. Am. Econ. Rev. 98 (3), 769–807.

U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, 1943. Wages: war vs. non-war industries. Surv. Curr. Bus. 23 (12), 4. Dec. (Table 4).

Volden, C., Wiseman, A., 2007. Bargaining in legislatures over particularistic and collective goods. Am. Polit. Sci. Rev. 101 (1), 79–92.

Wallis, J.J., 1987. Employment, politics, and economic recovery during the great depression. Rev. Econ. Stat. 69 (3), 516–520.

Wallis, J.J., 1991. The political economy of new deal fiscal federalism. Econ. Inq. 39, 510–524.

Wallis, J.J., 1996. What determines the allocation of national government grants to the states? NBER Historical Paper No. 90.

Wallis, J.J., 1998. The political economy of new deal spending revisited, again; with and without Nevada. Exploration in Economic History 35, 140–170.

Wright, G., 1974. The political economy of new deal spending: an econometric analysis. Rev. Econ. Stat. 56 (1), 30–38.