Preliminary and Incomplete Draft – Comments Welcome

Financial Asset Ownership and Political Partisanship: Liberty Bonds and Republican Electoral Success in the 1920s

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Abstract: This paper investigates the effects of ownership of liberty bonds, which were marketed to American households during World War I, on political behavior in the 1920s. Our analysis indicates that counties in which a large fraction of the population subscribed to the bonds voted against the Democratic Party at higher rates in the presidential elections of the 1920s, contributing significantly to Republican victories. We argue these effects represent a reaction to the depreciation in the value of the bonds in the year prior to the 1920 election (when the Democratic Party held the presidency), and the substantial appreciations in the value of the bonds in the early years of the 1920s (under a Republican president), as the Fed raised and then subsequently lowered interest rates. Our results suggest the liberty bond campaigns had unintended political consequences, and illustrate the potential for financial asset ownership to increase the sensitivity of ordinary households to economic policy decisions.

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1. Introduction

The American effort in World War I was funded to a significant extent by a series of massive loan drives, in which so-called liberty bonds were marketed to individuals and institutions. Prior to the war, few American households owned financial assets other than bank accounts. But ordinary citizens subscribed to the liberty loans at extraordinary rates, and by 1919 close to two-thirds of American households owned a liberty bond—a rate that is greater than the percentage of modern American households that own stocks.[1] As a result, for the first time in the nation's history, fluctuations in financial markets became directly relevant to the finances of a large share of the U.S. electorate. And beginning in late 1919, in an effort to restrain the growth of credit and prices, the Federal Reserve enacted a series of increases in interest rates, which caused the market prices of liberty bonds to fall, causing millions of American households to suffer capital losses. Then in 1921, the Fed began to lower interest rates, causing liberty bonds to appreciate again.

We study the electoral consequences of the liberty bond drives and the Fed's policy changes. The 1920s were a period of Republican dominance in presidential politics, with Harding, Coolidge and Hoover respectively winning substantial majorities of the popular and electoral votes in 1920, 1924 and 1928. Previous scholarship has attributed these victories to internal divisions within the Democratic Party and to prosperous economic conditions under Republican presidents (Burner, 1968; Murray, 1976). We posit instead that voters responded to changes in liberty bond prices by voting against the incumbent Democrats when they depreciated in value, and later voting for the incumbent Republicans following their appreciation, in a pattern consistent with models of retrospective voting behavior. Such models (e.g., Achen and Bartels 2016; Hibbs 2000; Key 1956; Kramer 1971) argue that voters' choices are driven by backwards-looking assessments of how well the government has performed during an incumbent's tenure.

[1] The two-thirds rate is calculated from BLS survey data from 1919 discussed below. Gallup survey data indicates that in 2016, 52% of American households own stocks, down from a peak of 65% in 2007 (McCarthy, 2016).

We pursue this hypothesis using a new dataset of liberty bond participation rates in about 1,400 counties, assembled from archival sources, which we match to standard datasets on election outcomes. In order to address the problem that liberty bond participation rates may have been influenced by factors related to political partisanship, we investigate whether liberty bonds led to differential changes in voting outcomes in the 1920s relative to those in the previous decade, in a panel with county and state-year fixed effects. The results indicate that counties with higher liberty bond participation rates did indeed turn against the Democrats at higher rates, relative to their voting patterns in earlier elections.

One potential concern with this methodology is that liberty bond subscriptions may have been driven by unobservable county attributes not reflected in historical voting patterns, which nonetheless influenced voting behavior in the 1920s. For example, the level of per capita wealth in a county, which was likely an important determinant of liberty bond subscription rates, may have influenced voting outcomes in the 1920s to a much greater extent than in the previous decade, as the high wartime tax rates made income tax policy questions much more politically important. In order to address this possibility, we instrument for liberty bond participation using a measure of the predicted local severity of the fall 1918 influenza epidemic. The most lethal wave of the epidemic, which occurred in October 1918, coincided with the fourth liberty bond campaign, the largest of all of the bond issues and the one that is the focus of our empirical analysis. Our measure of the predicted severity of the influenza epidemic is based on a county's distance to large military training camps, where influenza morbidity and mortality rates were extremely high, and which were likely the source of the epidemic within the civilian population. Greater distance from military camps was strongly correlated with participation in the fourth loan, as the liberty bond drives were hampered by both the influenza epidemic itself, and by efforts to curtail the epidemic. Falsification tests show that these distances were uncorrelated with participation in the third loan, which was conducted prior to the influenza outbreak. Our IV estimates of the effect of liberty bond participation on the Democratic Party vote share indicate that a one-standard-deviation increase in a county's liberty bond participation rate led to a decrease in the Democratic Party vote share in presidential elections of 3.3 percentage points on average over the 1920-32 period.

In order to assess whether these effects could have been decisive, we estimate the same model using state-level data on election outcomes and liberty bond participation. We focus on the 1920 presidential election, in which Democrat James Cox won only 12 states, relative to Harding's 37, for electoral vote totals of 127 to 404. Counterfactual estimates of the Democratic Party vote share for the 1920 presidential election by state indicate that in the absence of the liberty bonds, the Democratic Party would have won 12 additional states, but would still have lost the electoral vote. That is, the effects our analysis attributes to liberty bonds contributed significantly to Republican electoral margins, but were unlikely to have been decisive.

This paper contributes to a growing literature on the significance of the liberty bond campaigns in American economic history (Garbade, 2012; Sutch, 2015; Kang and Rockoff, 2015; Hilt and Rahn, 2016). Most closely related is Julia Ott's *When Wall Street Met Main Street* (2011:54), which analyzes the political significance of the liberty bond campaigns, arguing that they "propagate[d] an investor theory of political economy." Yet Ott's book neglects any examination of the prices of liberty bonds, which we argue are critical for understanding their political consequences. Republican political campaigns in the early 1920s made frequent references to the fact that liberty bonds were trading well below the prices subscribers paid for them, and pledged to oppose policy initiatives such as a bonus for World War I veterans on the grounds that further borrowing would further depress liberty bond prices. We argue that the most important political legacy of the liberty loan campaigns, which the literature has overlooked, is that they created a large popular class of securities holders who suffered a significant depreciation in the value of their investments under a Democratic president, and then experienced a significant appreciation in the value of their investments under Republicans.

This analysis also contributes to the literature on policy feedback. Reversing the notion that public policies result from mass preferences and political participation, the policy feedback literature argues that "policies make politics" by affecting how people define their self-interest, calculate the stakes of politics, understand the meaning of citizenship, and express their political identities (Campbell 2012). Much of this work is focused on social policies, although recently a number of other areas have become

part of the literature.[2] A few contributions have considered feedback from policies that stem from military engagements.[3] We contribute to this body of work by analyzing war financing issues, which have not been considered in the literature. We argue that the policy choices political elites make about how to pay for the military personnel, weapons, machinery, and supplies required to fight an enemy "affect what individuals think, feel, and do as members of the polity" (Mettler and Soss 2004). In the case of World War I, bonds were sold to ordinary households not only to help finance the war, but to give them a financial stake in the country and its war effort. Marketing these assets to American households likely had its intended effect on attitudes toward the war. But as we show, it also likely had more complex and longer-term effects on public attitudes towards economic policy. Turning ordinary Americans into bond owners made them sensitive to changes in interest rates, and likely shifted their preferences towards greater stability and conservatism in public finance.

The policy feedback effects of debt finance have long played a role in American public policy. For example, in 1790 Treasury Secretary Alexander Hamilton argued for the issuance of federal debt to finance the assumption of state debts from the Revolutionary War in part because he understood that doing so would give the wealthy individuals who would buy the new debt a stake in the success of the new federal government. In particular, the holders of the debt would have an interest in supporting Hamilton's efforts to develop the federal government's capacity to collect taxes, and repay the debt (see Sylla, 2010). Conversely, the efforts by the Jacksonians to pay off the federal debt were enacted in part to end this source of support for a strong federal government. The liberty loan campaigns of World War I represent a later example of the operation of the same principles, but one in which the longer-term political consequences of the financing decisions may not have been anticipated by policy makers.

[2] These include same-sex marriage (Kreitzer, Hamilton, and Tolbert 2014), tax expenditures (Mettler 2012), criminal justice (Weaver and Lerman 2010), health policy (Barabas 2006, Pacheco 2013) and disaster relief (Chen 2013).

[3] Theda Scokpol's (1992) landmark book on civil war veterans' pensions, in fact, is often seen as field-defining. Another well-known example is Suzanne Mettler's study of the effects of the GI Bill on veteran's civic participation. And a spate of recent articles has examined the impact of military casualties on support for war (Althaus, Bramlett, and Gimpel 2012), the fate of political incumbents (Grose and Oppenheimer 2007; Kriner and Shen 2010; Karol and Miguel 2007), and voter turnout (Davenport 2015; Koch and Nicholson 2015).

Finally, this paper contributes to the literature on the relationship between the composition of households' wealth and their political beliefs and voting behavior (Guiso et al., 2003; Schreiner and Sherraden, 2006; Ansell, 2014; Lewis-Beck, Nadeau, and Foucault 2013; Rahn and Dancy 2009). Some have argued that the broadening of stock ownership in recent years has led to greater identification with the Republican Party and increases in the Republican vote share (Davis and Cotton, 2007; Duca and Saving, 2008, Lewis-Beck and Nadeau 2011; Rahn and Dancy 2009). However, this literature generally cannot convincingly address the concern that financial asset ownership ownership may itself be influenced by party identification, or by other factors related to party identification (Huberty 2011). This paper contributes to that literature by studying a context with plausibly exogenous variation in financial asset ownership. An additional advantage of our setting is its focus on bond values. The depreciations and appreciations in the prices of liberty bonds that occurred between 1919 and 1924 were clearly related to changes in monetary conditions that originated in decisions by the Fed and by the Treasury. In contrast, booms or crashes in the stock market can have a broad range of plausible explanations and in some cases may be seen as only indirectly related to government policy choices. The more direct connection between economic policy and bond prices likely makes our test of pocketbook concerns in retrospective voting somewhat stronger than those conducted with modern stock ownership data.

2. Financing World War I

2.1 Bond Finance

The scale of the expenditures required for the American participation in World War I were completely unprecedented. For each of the years 1913-1916, total expenditures of the federal government were less than $750 million. By 1919, expenditures grew to $18.5 billion, a nearly 25-fold increase (Carter et al., 2006: table Ea584-587).[4] While Treasury Secretary McAdoo was considering his options, vigorous debates raged outside and inside Congress about whether, and how much, to rely on taxes or

[4] Eisner (2001) discusses in detail that various ways the war expanded not only the size, but the administrative capacity, of the federal government.

debt to pay for the war. Higher taxes, the alternative favored by most economists, organized labor, and Progressive politicians such as Senator Bob LaFollette, were resisted by banks, businesses, and the wealthy. Initially, McAdoo called for half of war financing to be provided by increased taxes of various kinds, and the other half to be raised by borrowing from the public. Persuaded by those who argued that high taxes would reduce support for the war by the wealthy, alarmed by revised estimates of the cost of the war, and equipped with contemporary British and German examples of government efforts to market their war debt to ordinary citizens, McAdoo eventually settled on a 1/3rd-2/3rd split between taxes and borrowing. In the end, taxes financed about one-quarter of the cost the war (Kang and Rockoff 2015; Garbade 2012; Sutch 2015).[5]

In addition to relieving the burdens imposed by taxation, financing the war through borrowing offered a number of other advantages. It was hoped that persuading American households to buy bonds would induce them to reduce their consumption, relieving wartime pressures in goods markets. Purchases of war bonds were also seen as giving American households a financial stake in the war effort and increasing support for the war. McAdoo believed that people who were unable to support the country by fighting would welcome a chance to do their share in the "financial trenches" at home (McAdoo 1931). It was also believed that bond sales drives would have propaganda value, demoralizing the enemy if the American public responded with great enthusiasm to the chance to demonstrate their patriotism.

Policymakers were keen to make liberty bonds attractive to ordinary Americans: "This was important because the strength of Government finance, like the strength of Government policies, rests on the support of the people" (*Annual Report of the Secretary of the Treasury* 1917:7). Several features of their marketing were designed to facilitate purchases by people of relatively moderate means. The bonds

[5] Prior to the war, the tariff was the primary source of federal government revenue even though the income tax had been in place since 1913. That would change dramatically as a result of war financing. The various War Revenue Acts put in place a steeply progressive income tax structure, lowered personal exemptions, thereby subjecting more American households to the federal tax, added income surtaxes, including a 65% surtax on incomes over $1 million, and levied taxes on "excess" corporate profits, a measure popular with the public and progressive politicians (Mitchell 1970, Rokoff 2012, Saldin 2011; Witte 1985). According to Rokoff (2012), the latter was the most important source of tax revenue during the war. Several scholars have examined the legacy of WWI-era progressive taxation on American political development (Mayhew 2005; Eisner 2000; Saldin 2011). On war financing and tax progressivity more generally, see Flores-Macías and Kreps (2013) and Scheve and Stasavage (2010).

were sold in denominations as low as $50, and subscriptions could be fulfilled through installment plans, both of which made the bonds accessible to a broad range of American households.[6] For example, a $50 liberty bond could be purchased by a payment of $4 up front, and then 23 weekly payments of $2. In addition, Treasury allotments were weighted toward smaller investors (Garbade 2012; Sutch 2015). As a result of these efforts, tens of millions of Americans became owners of financial assets other than bank accounts for the first time.

Borrowing on such an enormous scale required extraordinary efforts to market the bonds. The usual underwriting and distribution networks for debt issues did not have the capacity to handle that level of borrowing on anything close to reasonable terms, particularly given that none of the bonds could be sold in Europe. For suggestions about how to organize an effort to market war bonds on a mass scale, McAdoo looked to the experience of the Civil War. As one method of raising revenue, then-Treasury Secretary Salmon Chase tapped the financier Jay Cooke to try his hand at selling government debt directly to ordinary Americans. Cooke did so by organizing a sales force paid on commission. Motivating sales agents through financial self-interest, McAdoo believed, was a "fundamental error…Chase did not capitalize the emotion of the people, yet it was there and he might have put it to work" (McAdoo, 1931, p. 374). McAdoo put the emotion of the American people to work in the marketing of liberty bonds. Rather than the continuous sale of a single issue, the loans were marketed in a series of campaigns, each with a specific opening and closing date and sales goal, in order to keep engagement levels high. A final victory loan drive was conducted after the Armistice.

Table 1 presents summary data on each of the individual loan drives. As the high levels of government borrowing began to put pressure on credit markets, the later bonds were issued with higher coupon rates. The bonds were all sold to investors at par, meaning that their initial yield to maturity was equal to their coupon rates. All told, the five bond drives raised around 24 billion dollars. As a constant

[6] Adjusting for inflation, $50 in 1919 is equivalent to $673 in today's money. This was not an insignificant sum, but an amount similar in magnitude to the cost of many common household appliances. A separate program, War-Savings Stamps, was created to reach small savers.

share of GDP, this would be equivalent to more than $5 trillion today.[7] Sales of the fourth Liberty Loan alone totaled nearly seven billion dollars, with nearly twenty-three million people, more than 20 percent of the U.S. population, buying bonds.

2.2 The Liberty Loan Drives

The organization and conduct of the liberty loan campaigns has been described in detail elsewhere (see St. Clair 1921; Greenough 1922; Whitney 1923; Kennedy 2004; Ott 2012; Kang and Rokoff 2015; Sutch 2015; and Hilt and Rahn 2016). Briefly, the Treasury Department directed the Federal Reserve Banks to manage bond sales within their geographic districts. They did so by creating state liberty loan committees that in turn selected local notables to comprise county- and city-level organizations. Virtually all of civil society was enlisted by these committees, and organizations as diverse as women's clubs, the Boy Scouts, and fraternal and religious organizations all contributed to the effort. Local committees recruited a salesforce from these associations, forging "patriotic partnerships" (Skocpol et al. 2002) to market the bonds as broadly as possible. Over two million people volunteered as foot soldiers for McAdoo's financial army (Annual Report of the Secretary of the Treasury, 1918). Shoe leather was augmented by extensive advertising and promotion in newspapers, magazines, movie theaters, and department stores. A variety of different motives were highlighted in these appeals: citizen duty, patriotism, social comparison, community competition, xenophobia, group pride, and others. The nation's economic institutions did their part too. Employers released their workers for liberty loan events, larger companies offered payroll deduction to employees as a way to pay for liberty bond subscriptions, and the nation's commercial banks advertised the loans to their customers, processed their subscriptions, and offered them safety deposits boxes free of charge for their liberty bond certificates.

The broad participation of American households in such a massive undertaking was extraordinary. Some perspective on the extent to which ordinary households were induced to purchase

[7] Calculations based on Williamson (2015).

the bonds can be found in data collected by the Bureau of Labor Statistics (BLS) in 1918-19. In those years, the BLS conducted one of the first-ever surveys of American households' incomes and expenditures. Although it was unconnected to the liberty loan drives, the households' responses to the survey's comprehensive questions revealed whether they had purchased liberty bonds within the previous year. The BLS surveyed nearly 13,000 families in the middle of the earnings distribution, who resided in 99 cities.[8] Among the surveyed households, nearly 68 percent had purchased a liberty bond in the previous year, and the mean amount that they had purchased was about $60.[9] This is *more than twice* the rate at which modern households with equivalent inflation-adjusted incomes own shares of corporate stock, the most widely held risky financial asset.[10]

2.3 Evolution of Liberty Bond Prices

Within weeks after their issuance, a secondary market for liberty bonds developed, and they saw active trading daily on the New York Stock Exchange. The unprecedented size and liquidity of the market for liberty bonds made them the "premier security" of the world's financial markets, and their yields became the benchmark against which other fixed-income securities were compared.[11] However, their prices experienced significant fluctuations, due in part to changes in monetary policy that were implemented beginning in 1919.

The World War I years were a period of relatively high inflation in the United States, due in part to the rapid expansion of money and credit created by the Federal Reserve to help fund liberty bond purchases (see Friedman and Schwartz, 1963). The Fed offered relatively low interest rates on loans

[8] The data from the original survey manuscripts were are collected and presented in Olney (2005). Further information on the surveyed households is presented in Feigenbaum (2016).
[9] Authors' calculations from the data in Olney (2005).
[10] In inflation-adjusted terms, the BLS survey households have incomes generally ranging from the 20th to the 30th percentile of the 2013 income distribution. According to the 2013 Survey of Consumer Finances, 26.4 percent of these households with these incomes own shares of stock directly or indirectly. It should be noted that this represents the total holdings of stock, whereas the BLS survey counts only purchases within the previous year, so that the differences between the two levels may actually be understated.
[11] *Magazine of Wall Street*, 16 October 1920, p. 821. Prior to World War I the United States government had relatively little debt outstanding, and its debt securities therefore did not play as important a role in financial markets.

collateralized by liberty bonds, contributing to demand for the bonds, and helping to keep their yields (and therefore the interest burden associated with servicing the bonds) relatively low. In the year following the Armistice, these practices continued, and inflation accelerated. In order to suppress inflationary pressures, several of the Federal Reserve District banks sought to raise their discount rates during the first half of 1919.[12] Yet an increase in interest rates would have conflicted with the marketing of the Victory Loan, and perhaps forced the Treasury to offer a higher coupon rate on the loan, raising its costs to the government. The continued financial needs of the federal government, in its efforts to wind down the war effort, manage the transition to a peacetime economy, and negotiate postwar loans to European countries, dictated that interest rates remain low. Then-Treasury Secretary Carter Glass, who was by nature of his office an ex officio member of the Federal Reserve Board, opposed any rate increase, and the Federal Reserve Board deferred to the Treasury's wishes. Throughout most of 1919, the discount rates of the Federal Reserve banks remained at 4 percent, the level they had set for most of 1918. Inflation continued, and concerns mounted that artificially low interest rates were fueling speculation.

Finally, in December 1919, the Treasury withdrew its objection to rate increases, and the Federal Reserve Banks began to raise their discount rates, with the blessing of the Federal Reserve Board. Partly as a result of its inexperience with such matters, these rate increases were "not only too late but also probably too much" (Friedman and Schwartz, 1963: 231). The discount rate was increased from 4 percent to 4.75 percent in December 1919, then 6 percent in January 1920, and finally 7 percent in June 1920, an extraordinary level that was not reached again until the 1970s. This induced a rapid contraction in financial markets and in economic activity, triggering a severe recession. The Fed began to lower its rates in April of 1921 in a series of 0.5 percent cuts that ultimately brought the discount rate back down to four percent by June 1922.

[12] Whereas today, the Federal Reserve quotes a single discount rate, in the 1920s each of the twelve Federal Reserve District Banks could quote their own somewhat different rates, subject to the approval of the Federal Reserve Board.

Liberty bond prices were intimately connected to these changes in the Fed's discount rates.[13] The increases in the Fed's rates in 1919-20 were mirrored by similar changes in the yields on liberty bonds, and these increases in yields could only be produced by a fall in prices.[14] The different maturities, coupon rates and tax privileges among the different liberty bonds meant that the changes in prices and yields that occurred varied somewhat, but they all moved in the same direction.

Figure 1 shows how this process unfolded. The top panel shows the New York Fed's discount rate, and how it ratcheted up quite steeply in late 1919 and early 1920, and was then lowered beginning in 1921. This pattern is repeated in the yields of liberty bonds, as presented in the middle panel of the figure. Although the increase in yields was greater for the victory loan than for the others, all rose sharply, and then began to fall. In the lower panel, the steep drop in the prices of the loans is evident, with the greatest decrease for the fourth loan, due to its long maturity.[15] Beginning in 1921, those prices begin to recover, and the price increases continued into 1922-24.

An indication of the effects of these fluctuations for ordinary investors during the presidential campaigns of 1920 and 1924 can be found in Table 2, which shows the one-year return to holding a share of the fourth liberty loan up to the date of the campaign. The data in the table show that in September 1920, about a month and a half prior to the presidential election, the return to holding one of those bonds had been -4.08%, compared to the yield at issue of 4.25%, a difference of -8.33 percentage points. Then in September 1924, prior to the 1924 election, the return over the previous year had been 8.54%, 4.29 percentage points above the yield at issue.

[13] Indeed, one of the most important forms of collateral for loans from the Federal Reserve banks was liberty bonds themselves; the increases in the discount rate raised the cost of obtaining credit using liberty bonds.
[14] For those unfamiliar with the price-yield relationship: bonds are obligations to make a fixed series of payments. The only way the rate of return to owning those payments can increase is for the price paid for them to fall.
[15] All else equal, the longer the maturity of a bond, the more sensitive its price is to changes in its yield.

3. Political Impact of Liberty Bond Price Changes: Narrative Evidence

The fall in liberty bond prices in 1919-20 was widely reported in the financial press and aroused considerable agitation in the public that did not go unnoticed by members of Congress.[16] In one response, Representative Walter Magee, a Republican from New York, introduced HR 501 in April of 1920. The Resolution called for the appointment of a special bi-partisan committee to investigate the decline in liberty bonds prices. In a hearing before the House Rules Committee a month later, Magee inserted in the Congressional Record a variety of written material from around the country accusing the government of reneging on its promise to provide its patriotic citizen investors with the safest investment in the world in exchange for their financial sacrifice during the war. The public, the committee was informed by the editors of the *Syracuse News*, was "disillusioned—distressingly so…It is sore and disgusted and does not disguise the fact." The editorial went further, averring that the people of the United States "will not care to be singed twice in the same place" should the government need to come calling again.

The official reports of the U.S. Treasury sought to explain the relationship between interest rates and bond prices to investors and policy makers alike.[17] But given that millions of households had been induced to become bond holders for the first time by the federal government, the collapse in their values was embarrassing, and was perceived as a betrayal. A new constituency, created by policy decisions to finance the war in a particular way, was generating an altogether different set of political demands to which elites were struggling to respond.

It was perhaps unfair to criticize the Wilson Administration for the fall in liberty bond prices; an adjustment in interest rates after the war was inevitable. Yet some of the choices made by the Wilson Administration in the design of the liberty bonds and in the conduct of monetary policy likely magnified

[16] "Liberty Bonds Show Further Large Declines" *Wall Street Journal*, Nov. 26, 1919, p. 1. "Liberty Bonds Sell Off: Fourth 4 ¼ s Touch New Low Record and Second 4 ¼ s Nearly Down to It." *WSJ* Aug. 28, 1919 p. 10.
[17] For example, the Treasury's 1919 Annual Report (p. 123) states that liberty bonds "are selling below par partly because the war and post-Armistice conditions have resulted in a world-wide shortage of capital and credit which has greatly increased the price of money" (meaning: interest rates).

the impact of those interest rate changes on liberty bond holders.[18] For example, the Treasury resisted any increase in the discount rates of the Federal Reserve Banks in 1919, in order to control the cost of the victory loan. This delay probably contributed to the size and swiftness the Fed's ultimate rate increases, and the resulting fall in bond prices. In addition, there is evidence that some of the liberty bonds were sold at prices above prevailing market rates, which likely contributed to their fall in prices in the secondary market after they were issued.[19] Finally, the wisdom of the decision to mass market negotiable securities to uninformed investors with no knowledge of or experience with financial assets can be questioned. Secretary McAdoo's testimony in Congress suggests he did not anticipate the significance of the depreciation of liberty bond prices for ordinary investors:

> There is a curious feeling in the breast of the average man that if he buys a Government bond…[and then] gets tired of his investment and wants to get his money back, that he ought to be able to sell that bond at par…It is extraordinary the extent to which that feeling exists…It is a perfectly unreasonable feeling…[20]

The Treasury did offer non-negotiable war savings stamps to investors of more modest means; for example, stamps that paid $5 in 1923 were sold for just above $4 in January 1918 and could be redeemed prior to 1923 on a fixed schedule of prices (see Garbade, 2012: 66-67). Many investors would likely have been better off purchasing war savings stamps, or some vehicle like them, but the Treasury did not promote them very aggressively.[21]

Whether or not it was reasonable to do so, the Republicans seized the opportunity to criticize the Democrats for what they described as financial mismanagement. The Harding campaign's newspaper advertisements frequently reminded voters that their liberty bonds were selling below par, and promised to end the "extravagance of government" and "looseness, laxity, inefficiency and incompetency" responsible for that state of affairs; see Figure 2. Perhaps the clearest indication that the welfare of liberty

[18] This is not to say that the choices made were wrong ones, only that they weighed minimizing the costs of financing the war much more heavily than safeguarding the interests of liberty bond holders much more heavily in their decisions.
[19] For example, at the end of the campaign for the 4 ½ percent fourth liberty loan, which was sold at par (100), the price in the secondary market for the 4 ½ percent third liberty loan was around 97. See Garbade (2012: 107).
[20] Testimony before the House Ways and Means Committee, 1918, reproduced in U.S. Treasury (1921).
[21] In a reflection of the lessons learned from World War I, the Series E war bonds marketed to households in World War II were non-negotiable savings bonds. Marketed to households of very modest means and to children, stamps came in denominations as low as 25 cents.

bond subscribers was central to the 1920 election campaign was their prominent appearance in the Republican Party platform:

> The fact is that the war to a great extent, was financed by a policy of inflation, through certificate borrowings from the banks, and bonds issued at artificial rates sustained by the low discount rates established by the Federal Reserve Board…The results have been a greatly increased war cost, *a serious loss to the millions of people who, in good faith, bought liberty bonds and victory notes at par* (emphasis added).

The Republicans appealed to securities holders who had seen their investments fall in value, and their message likely resonated among a broad segment of the electorate.

Harding's campaign also rejected proposed spending increases, with appeals to the depreciated value of liberty bonds. Among the most contentious issues in 1920s politics was the plight of World War I veterans, and efforts to pay them a bonus in compensation for the low real value of the wages they had paid during the high inflation years of the war. Harding rejected such proposals during the campaign, arguing that the additional borrowing they required would cause a further depreciation in liberty bond prices.[22] When Congress later passed a bonus bill, President Harding vetoed it. At least in the early years of the 1920s, Republicans successfully pitted the interests of liberty bond holders against advocates for a veterans bonus or other spending increases.[23]

As the Fed eased interest rates in 1921 and 1922, liberty bonds appreciated in value. Senator Simeon D. Fess of Ohio, in a speech construed to be a semi-official announcement of Harding's re-election bid, extolled the accomplishments of the President and invited the public to behave just like models of retrospective voting say they ought to: "President Harding has been in office just two years. Those two years have been crowded with a great volume of constructive and remedial work. *The record is now made up; the results are apparent upon which the people must give their verdict of approval or*

[22] *The New York Times*, "Harding In Doubt As to Bonus Bonds, 4 September 1920: "After remarking that a cash bonus would cost perhaps $2,000,000,000 Mr. Harding said: `Now, with our present Liberty bonds below par, what would be the result if we proceeded to issue more bonds?'"

[23] A veteran's bonus was finally paid in 1936; see Hausman (2016).

disapproval (emphasis added)."[24] The return of liberty bonds to par was specifically mentioned by Fess as an indicator of the prosperity occasioned by the Administration's policies.

Harding did not live to see himself re-nominated. His vice-president, Calvin Coolidge, succeeded him, and received the Republican nomination for president the next year. Despite Democratic charges of corruption and a whistle-stop campaign featuring a Signing Teapot (Shulman 2015), Coolidge went on to a comfortable win. The Republican Party platform of 1924 began by reminding voters just how bad things were when the party took over: "there were four and half million unemployed; industry and commerce were stagnant; agriculture was prostrate; business was depressed; *securities of the government were selling below their par values*" (emphasis added). Now, thanks to Republican rule, especially its economic policies, things were considerably improved: The federal budget deficit had been erased, taxes lowered, and "*[g]overnment securities increased in value more than $3,000,000,000."* If holders of liberty bonds behaved as retrospective voters, we would expect them to "Stay Cool with Coolidge" by rewarding his administration with their votes.

Although some portion of the fluctuations in liberty bond prices that occurred during 1919-24 was clearly beyond the immediate control of the President or Congress, retrospective voters who owned liberty bonds and attributed at least some part of the fluctuations in their value to their elected officials would have been critical of the Democrats in the 1920 election, and supportive of the Republicans. The historical record indicates that political elites were aware of this potential, and the Republicans incorporated statements about liberty bond prices and returns into their appeals to voters. But it remains to be seen whether those appeals were effective, and whether liberty bond ownership actually mattered for election returns.

[24] "Harding Certain 1924 Candidate, Fess Declares." *Chicago Daily Tribune*, 10 April 1923, p. 7

4. Data and Methods

For the purposes of this paper, we assembled a new dataset of liberty bond subscriptions at the county level for several Federal Reserve Districts from documents found in a number of different archives. These documents were published by the Federal Reserve Banks' liberty loan committees or by state-level liberty loan committees. The Minneapolis Federal Reserve, for example, published county tallies for the Ninth District in one of its *Liberty Bell* newsletters which we uncovered at the South Dakota Historical Society. Other reports turned up at the National Archives, in Princeton University's Mudd Manuscript Library, the Library of Congress, and in books that individual states published on their WWI involvement.

We focus our analysis on the Fourth Liberty Loan, the largest issue, and the one for which we found data for the greatest number of counties. As we are interested in voting outcomes, we utilize data on subscription rates, defined as the number of subscribers reported for a county, divided by the county's 1920 population. The fourth loan had the highest participation rates of all the loans, and the subscription rate for that loan provides a reliable indicator for the minimum extent to which the county participated in the liberty bond drives.

We match these county-level data on liberty bond subscription rates to data on county voting patterns from an ICPSR dataset compiled by Clubb, Flanigan and Zingale (2006). In order to control for county characteristics that may have been correlated with liberty bond subscriptions and also with electoral outcomes, we also match these counties to 1920 county characteristics reported in historical federal censuses, from and ICPSR dataset compiled by Haines (2010). Summary statistics for the 1920 values of the main variables in the dataset are presented in Table 3. As we are focused on electoral outcomes, these summary statistics, and all of the subsequent statistical analysis, will be presented in population-weighted terms.

An illustration of the coverage of our liberty bond subscription data is presented in Figure 2, which presents a map of the counties for which we have data for the fourth loan, shaded by the level of

subscriptions. The irregular pattern of coverage reflects the fact that we have data for this loan from the Fourth District (Cleveland Fed), Fifth District (Richmond), Eighth District (St. Louis), Ninth District (Minneapolis), and Twelfth (San Francisco), plus the state of Iowa.[25] The data in the figure present some clear regional patterns: subscription rates were relatively low south of the Mason-Dixon line and higher in the upper Midwest and West.

This presents a challenge for the analysis: geographical variation in liberty bond participation rates may produce spurious correlations with variables with similar geographic patterns, which may include voting outcomes. In order to address this challenge, we estimate the effects of the liberty bonds in a panel framework with county fixed effects and state-year fixed effects, so that the effects of any unchanging county characteristics (such as location) are eliminated, and the differences over time are estimated only from variation within states' borders. Later in the analysis, we will also utilize an instrumental variables framework to address the endogeneity of liberty bond participation rates.

5. Estimation

5.1 Baseline Results

In order to analyze the effects of liberty bond participation on election outcomes, we estimate the following model of the democratic vote share in presidential elections, from 1908 to 1932:

$$demshare_{ist} = \alpha_i + \gamma_{st} + \delta libloanparticip_i \times post18_t + \boldsymbol{\beta X}_{it} + \varepsilon_{it}, \qquad (1)$$

where α_i is a county fixed effect, γ_{st} is state-by-year fixed effects, $libloanparticip_i \times post18_t$ is an interaction between the county's liberty loan participation rate and an indicator for elections in the years following the liberty loan campaign, and $\boldsymbol{X}_{it}$ is a vector of 1920 county characteristics, also interacted

[25] We lack data for the First District (Boston Fed), Second (New York), Third (Philadelphia), Sixth (Atlanta), Seventh (Chicago), Tenth (Kansas City) and Eleventh (Dallas.) These districts do not appear to have published any county level records for sales of the fourth loan. In the cases of Boston, Philadelphia and New York, this likely reflects the fact that those Banks were more focused on the sales of liberty bonds to wealthy individuals and institutions. Those Reserve Banks were also more focused on the sales of short-term securities ("certificates of indebtedness"), which provided liquidity between liberty bond issues, and which were marketed to financial institutions. Boston and New York published detailed statistics relative to the sale of those latter securities.

with a post-1918 indicator. The main coefficient of interest is δ, which represents the differential effect of liberty loan participation in elections following the liberty loan campaigns.

Table 4 presents the results. Column (1) presents the estimates from a baseline specification which includes post-1918 interactions with 1920 county homeownership rates and the fraction of the population residing in major urban areas, variables that likely influenced both liberty bond participation and electoral outcomes. The estimated effect of liberty bonds implies that a one-standard-deviation increase in participation led to a decrease in the Democratic Party vote share of about 1.3 percentage points (=-0.12 × 11.1). As the median margin of victory for the Democratic Party among the sample counties was 5.6 percentage points, this effect is modest, but not irrelevant.

The 1920s were an era in which agricultural areas suffered from significant economic disruptions, due to falling commodities prices. In addition, the recession that was induced by the Fed's tightening in 1919 created a brief period of significant financial distress, which was concentrated in agricultural areas. If the geographical intensity of these shocks was correlated with liberty bond participation, then this may have contributed to their estimated effect. In order to address this possibility, in column (2) we include measures of the importance of agriculture in a county (agricultural workers per capita), and the scale of 1920 bank distress (suspended deposits per capita) in the regression. In column (4), we include farm tenants per capita, a measure of inequality that may have been related to liberty bond participation and to economic conditions in the state. None of these variables substantially changes the estimated magnitude of the effect of liberty bonds on election outcomes in the 1920s.

To explore the timing of the estimated effects in greater depth, we re-estimate equation (1) with a modified specification in which we replace the post-1918 liberty bond interaction with election-by-election interactions. This enables us to observe the changing magnitudes of the effects over time, and also to address the possibility that the estimated post-1918 effects represent the outcome of an ongoing differential trend. The estimates of a specification with all the same controls as that of column (1) in Table 4 is presented in Figure 4.

Reassuringly, the pre- 1920 estimates display no apparent downward trend over time; the large negative effect of liberty bond participation appears for the first time in 1920. Liberty bond prices were relatively stable in the second half of the 1920s, and over time the amount in the hands of the initial subscribers decreased, and the U.S. Treasury purchased outstanding shares with the proceeds of new debt offerings. As a result, liberty bond prices lost their political salience over time, and one would expect the effect of liberty bond subscriptions to diminish substantially after 1924. Consistent with expectations, the magnitude of the effect of liberty bonds on the Democratic Party vote share decreases significantly in 1928 and 1932, relative to 1924 and 1920.

5.2 An Instrument: Predicted Severity of Influenza

The campaign for the fourth loan, which was conducted between September 28 and October 19, coincided with the beginning of the most significant wave of the1918 influenza epidemic in the United States.[26] Efforts to promote the fourth loan were hampered by many individuals' reluctance to attend public events for fear of exposure to influenza, by sickness and incapacitation among the members of the organizations tasked with promoting bond sales, by lost incomes due to illness and business closures, and by measures imposed to halt the spread of the epidemic, such as prohibitions against public assemblies.[27] Treasury officials stated that the epidemic created "a great handicap" for the loan campaign.[28] The goals for the campaigns' total sales were ultimately met, but the subscription rates within the population—the focus of this study—were likely reduced, as the campaign organizers leaned more heavily on institutional purchasers to meet their sales goals. If the epidemic reduced subscription rates to varying degrees around the country, and if it had no consequences on election outcomes beyond those resulting from its effects on the loan campaigns, then it may represent the source of a valid instrument.

[26] The 1918 influenza epidemic occurred in three waves: the first around March of 1918, the second and most widespread and deadly in the fall of 1918, and the third in early 1919. See Crosby (2003) and Byerly (2005).
[27] The latter included prohibitions against public gatherings, which resulted in the cancellation of some Liberty Loan parades and rallies; the closure of movie theaters, where the bond purchases were promoted; and the closure of churches and schools. See Bootsma and Ferguson (2007).
[28] "Appeal to Nation to Tax Resources in Buying Bonds," *New York Times*, 10 Oct. 1918.

Weekly data for influenza deaths per 100,000 residents for seven major cities are plotted in Figure 5. Among the cities in the figure, there was considerable variation in the severity of the influenza epidemic, both during the fourth loan campaign and overall, with Philadelphia enduring more than 600 deaths *per day* during the week of October 19, whereas Portland and Minneapolis suffered to a far lesser extent. Unfortunately, data on influenza deaths are available only for a small number of cities, and deaths from all causes are available only for a few hundred.[29]

Yet the observed death rate from the disease may not, in fact, accurately reflect the extent to which the influenza epidemic hampered the fourth loan campaign. Efforts to halt the spread of the disease, such as local prohibitions against public gatherings, likely suppressed both influenza and the bond drive.[30] Alternatively, in cities where the campaign was permitted to be prosecuted aggressively with large parades and public rallies, the bond drive may have spread influenza and increased the number of deaths from the epidemic.[31] Both cases would produce a positive correlation between liberty bond participation and influenza deaths, obscuring the deeper negative relationship between the two.

Instead, we utilize a measure of the predicted severity of the epidemic, based on proximity to its source within the United States: military camps. During the war, draftees were sent mainly to 32 large camps to receive training, and sometimes later sent to a handful of additional camps to prepare for deployment overseas. These camps were often quite overcrowded, and as they were populated by young men—those at the age most vulnerable to the 1918 influenza—they constituted an ideal environment for

[29] Weekly data on influenza deaths are available for 45 American cities. Unfortunately, the cities are not geographically representative (five are located in Massachusetts alone), and are often incomplete—many cities made influenza a reportable cause of death well after the death rate from influenza had risen significantly. The raw data are from US Bureau of the Census (1917-1920), and also reported in Ministry of Health (1920) and Crosby (2003). Monthly data on deaths from all causes are available for about 530 cities in about 370 counties in US Bureau of the Census (1920).

[30] Suggestive evidence of the effectiveness of these measures is presented in Hatchett et al (2007), Bootsma and Ferguson (2007), and Markel et al (2007).

[31] For example, the decision of the Mayor of Philadelphia to permit a huge Liberty Loan parade to be held on September 28, against the objections of some local public health officials, may have contributed to the severity of the outbreak in that city (Hatchett et al., 2007). Crosby (2003:53) notes that public health officials in Chicago permitted a Liberty Loan parade to be held, but in a reflection of the state of medical knowledge at the time, "instructed all of the marchers to go home right afterwards, remove all clothing, rub the body dry, [and] take a laxative" in order to reduce the risk of contracting influenza.

the spread of the epidemic.[32] Although the camps were put under quarantine when large numbers of soldiers fell ill, these quarantines were often enacted too late and enforced imperfectly, making the armed forces "the foci from which the civilian population received the disease."[33]

The locations of the military's camps are shown in Figure 6. Proximity to these camps has been linked to the severity of the influenza epidemic; Crosby (2003:71), for example, suggests that Philadelphia's location near both Camp Dix and Camp Meade contributed to the outbreak in that city. In addition, the movements of troops spread influenza not only among the camps, but also into the civilian populations along the routes followed by railroads that connected the camps' locations. Thus we use the average distance from a county to each of the camps depicted in Figure 6, as our measure of predicted flu severity. These distances for our sample counties are presented in Figure 7.

To verify that these distances are correlated with the severity of the 1918 influenza outbreak, we investigate their relationship with mortality rates within the 369 counties for which deaths from all causes can be observed.[34] And in order to verify that any October 1918 mortality effect does not simply reflect something present in all months (say, due to persistent differences in public health conditions or demographics), the relationship between county distance to the camps and mortality is estimated for every month in 1917 and 1918, in a framework with county fixed effects. The estimated coefficients, presented in Figure 8, show very clearly that distance to the camps was an extremely important determinant of county mortality in October 1918, but not in earlier months. Greater distance from the camps was in fact associated with a slight mortality advantage, particularly in the summer months, prior to October 1918.

The validity of the distance measure as an instrument for participation in the fourth loan is explored in Table 5. The table presents cross sectional regressions of the relationship between distance

[32] The influenza epidemic was so acute within the military that total deaths due to influenza among American military personnel were similar in number to deaths in combat. See Byerly (2010).
[33] Crosby (2003: 56). Similarly, Byerly (2005: 79) notes that "the epidemic in the United States most likely originated in military installations."
[34] These data are constructed from monthly death rates from around 530 cities located in 369 counties. The city data are summed for each county, and then divided by the county's 1920 population. This introduces some noise into the measure, both because some counties contained cities for which no death data are reported, and because the county population was likely different in 1918. The raw data are from U.S. Bureau of the Census (1920).

to camps and participation in the fourth loan for the 1,426 counties for which we have liberty bond data. (These are cross-sectional versions of the first stage from the panel regressions presented below.) The regressions include state fixed effects, which means that the parameter on the distance to camps variable is estimated only from within-state variation in those distances. The results in columns (1) and (2) indicate that distance from military camps had a robust positive effect on liberty bond participation, consistent with greater distances resulting in a less severe outbreak of influenza, and therefore fewer influenza-related problems in the conduct of the bond drive. In order to address any remaining concern that the result could be somehow driven by the South, in column (3) all counties from Southern states are deleted from the sample, and the result remains largely unchanged.

Finally the mechanism behind the distance measure proposed here is that its effects operate through the influenza outbreak, and not through other institutional or economic characteristics that may also be correlated with distance from the camps. In order to address the latter possibility, column (4) presents a falsification test: the distance measure (and other county characteristics) are regressed on participation rates in the third liberty loan, which was conducted in April 1918, before the lethal influenza outbreak in the fall. If distance to the camps led to higher participation in the fourth loan because it was correlated with institutional or economic characteristics associated with greater wealth or higher levels of civic engagement, then it should also be correlated with higher participation in the third loan. Yet the estimate in column (4) indicates that its effect on the third loan is far smaller. Reassuringly, most of the other estimates are similar to those in column (2), indicating that the determinants of participation in the third loan were generally similar to those of the fourth loan.

Some additional evidence in support of the relationship among distance from the camps, influenza, and the fourth loan campaign can be found in an official account of the progress of the bond drive printed in newspapers on October 18, including the *New York Times*.[35] The statement included one-sentence accounts of the state of the campaign in each district, some of which mentioned problems related to influenza, whereas others did not. For example, the statement from the Federal Reserve Bank of

[35] "Bond Sales Reach 4 Billion Mark, With 2 Days Left," 18 October 1918.

Philadelphia was "Making a real battle against enormous odds caused chiefly by influenza," whereas that of San Francisco was simply "Maintaining steady increase in face of bad agricultural conditions in some sections." If the mention of influenza in these accounts can be interpreted as a rough indication that the epidemic inhibited the loan campaign to a greater extent, then comparing the average distance to the camps for the districts that did and did not mention influenza can provide an additional test of the mechanisms behind the distance instrument.

Table 6 presents these comparisons. For each district, the average distance to the camps, calculated as the population-weighted average distance among every county within the district, is presented. Those mentioning influenza were indeed located closer to the camps, although the difference between the two groups, 215 km, is not statistically significant.

Of course, the exclusion restriction cannot be tested directly, and one can certainly imagine channels through which proximity to military bases may have influenced electoral outcomes that were unrelated to influenza. However, it is worth noting that many of these potential channels would operate in the opposite direction of the one observed. For example, some of the military camps were closed at the end of World War I, and one might imagine that the decline of economic activity associated with the demobilization in the areas surrounding the camps may have led to discontent with incumbent politicians. Yet as we shall see, the observed effect is the opposite: the closer a county was to military camps, the less likely they were to turn against the incumbent Democrats in 1920 or toward the incumbent Republicans in 1924. Similarly, one might imagine that high levels of mortality may have led to frustrations with the public response to the influenza epidemic, leading to discontent with incumbents. Yet once again, the effect is the opposite: places with *lower* flu mortality were more likely to turn against the incumbent Democrats to a greater extent, relative to their .

5.3 IV Estimation

We now turn to IV estimation of our model of county-level election outcomes. The equation to be estimated is the same as (1), with county and state-year fixed effects, only the $libloanparticip_i \times$

$post16_t$ variable will be instrumented with $distancetocamps_i \times post16_t$. The results are presented in Table 7.

Column (1) in the table presents baseline OLS results, and column (2) presents the results of the same specification estimated with 2SLS. The main parameter of interest, the effect of liberty bond participation on the Democratic Party vote share, is more than twice as large than the OLS estimate. The greater magnitude of the estimate may reflect the subset of the population from which the parameter is identified: persons who were induced to purchase liberty bonds, or not to purchase liberty bonds, purely as a result of their county's distance to military camps (and therefore, the local severity of the influenza epidemic). The severity of the influenza epidemic impacted the conduct of the liberty loan campaign, often resulting in canceled parades and rallies. Investors who purchased liberty bonds due to the relative mildness of the influenza epidemic in their area were therefore likely induced to do so by attending one of those events. They are therefore likely to have been less committed to purchasing liberty bonds, either due to financial resources or ideology, and probably can be thought of as marginal investors in the bonds. These are exactly the investors for whom a fall in the bond's prices would have constituted a surprise and betrayal, and it is not unreasonable to imagine that they may have responded to a greater extent in their voting than the average liberty bond investor.

Columns (3)-(5) add the same controls as in Table 4, and the estimated magnitude of the effect remains generally unchanged. The first stage of each equation is presented in the lower panel; in each case, the null hypothesis of weak instruments can be rejected.

Our preferred specification is that of column (2). The estimated effect of liberty bonds implies that a one-standard-deviation increase in subscription rates led to a 3.3 percentage point (=-0.299 × 11.1) decline in the Democratic Party's vote share in the elections of the 1920s. Another way to judge the size of this effect is to note that it implies that the Democratic Party's vote share fell by a population-weighted 6.1 percentage points on average across all sample counties, due to the effects of liberty bonds. This is a reasonably large effect, but it is estimated from only about half of the counties, so it is impossible to determine whether or not it was decisive. To make this determination, and to verify that our estimates are

not biased by the regional composition of the sample counties, we next estimate the same model at the state level.

5.4 Results with State Data

The annual reports of the U.S. Treasury present subscription rates for the fourth liberty loan at the state level. In what follows, we re-estimate (1) using OLS and 2SLS with state data. Our instrument for liberty bond participation is re-calculated as the population-weighted average of the distance of all a state's counties to the military camps. As we are limited to 48 states, we view this analysis as a relatively crude exercise in which we can assess the plausibility of our estimates and determine whether they could have been decisive, rather than an opportunity to rigorously explore the robustness or validity of our approach.

The results are presented in Table 8. The baseline OLS estimate presented in column (1) is larger than that obtained from county data, reflecting both the differences in the level of aggregation of the data, and the fact that the state data covers a broader geographical area. The 2SLS estimate in column (2) is again larger than the OLS estimate but the ratio of the two is roughly similar to that obtained from the county data. As with the county data, the distance measure creates a strong first stage, minimizing any concerns regarding weak instruments.

In order to determine whether these effects were decisive, we calculate counterfactual Democratic Party vote shares for the 1920 election, assuming that the liberty loan campaigns had never been held, and therefore the subscription rates for liberty loans were reduced to zero.[36] That is, for each state, we calculate a new Democratic vote share as the old one plus the added share from setting the liberty bond subscription rate to zero, or $-\hat{\delta} \times libloanparticip_i$. The actual and counterfactual vote shares are presented in Figure 9.

[36] We undertake this calculation to determine whether or not the effect of liberty bonds could plausibly have been decisive, rather than to truly evaluate a counterfactual in which the war were financed through some other means, which obviously would also have political implications.

As the figure makes clear, the effects of the liberty loans were substantial; setting the subscription rates to zero increases the estimated Democratic Party share significantly in many states. The 1920 election was a Republican landslide, with electoral vote totals of 404 to 127. Our estimates imply that in the absence of the liberty bond campaigns, the Democrats would have won 12 additional states, and the electoral vote totals would have been 292(R) to 239(D).[37] Thus, even this crude calculation that likely overstates the effects of the liberty bond campaigns indicates that their effects likely did not tip the balance in the outcome of the election. The Republicans still would have won, only in less of a landslide.

6. Conclusion

This paper has investigated the political effects of the liberty bond drives of World War I. Our analysis indicates that counties that subscribed to the bonds at higher rates turned against the Democratic Party at higher rates in the 1920 and 1924 presidential elections, relative their voting patterns in the previous decade. The 1920s were a period in which the Republicans came to dominate American politics, and the effects of liberty bond ownership contributed to that development, although they were unlikely to have actually changed the outcome of presidential elections.

These voting patterns likely reflect voters' assessment of economic policy decisions. Liberty bonds depreciated substantially in late 1919 and 1920. This was partly due to the Wilson Administration's reluctance to permit the Fed to increase interest rates in early 1919, which led the Fed to increase them dramatically when they were finally permitted to do so at the end of 1919 and in the first half of 1920. Then under Republican Administrations, rates were brought down in 1921 and 1922, and again in 1924, and liberty bond holders experienced substantial capital gains. Although the forces behind these events were partly beyond the control of elected officials, the choices of policy makers were certainly influential, and voters appeared to have understood this.

[37] The states the Democrats would have won are Nevada, Ohio, Utah, New Hampshire, Indiana, Delaware, Maryland, Missouri, West Virginia, Arizona, Oklahoma and Tennessee.

Our results constitute clear evidence that the composition of assets owned by households can influence their political behavior. In our context, bond ownership made ordinary Americans sensitive to changes in financial markets, which led them to reject incumbents who had presided over asset price decreases, and to support political candidates who claimed that they had brought fiscal stability and higher bond prices. This is consistent with a 'pocketbook' view of retrospective voting behavior. But it should be noted that the particular assets in question, and the relationship between their value and government policy, is somewhat different from modern contexts. Modern households generally own equities, rather than debt, and the value of equities is a function of a variety of factors, many of which are only indirectly related to government policy. Perhaps more importantly, during World War I American households were asked, even pressured, to buy liberty bonds by their government. This made the changes in their values, and the resulting impacts on households' wealth, a consequence of government policy.[38] Although the ownership of equities by modern households is related to government policy choices, such as the changes in the tax code that led to the proliferation of 401(k) plans or the creation of new, tax-exempt investment vehicles such as 529 college savings plans (introduced during the Reagan administration) or Roth IRAs (created during the Clinton years), the connection is less direct, and government promotion of asset ownership more subtle and less nationalistic, than in the early twentieth century. The value of households' retirement accounts may therefore not have the same political significance.[39]

Perhaps one way to put the political effects of liberty bond ownership into perspective is to compare them to modern debates over fiscal policy. The Obama Administration's 2009 fiscal stimulus

[38] Achen and Bartels (2016) recently have questioned whether retrospective voting is desirable from the standpoint of democratic accountability given evidence that voters appear to punish political incumbents for events over which they have no control such as shark attacks, droughts, or college football team losses (Healy, Malhotra, and Mo 2010). Our view is that liberty bond holders were "reasonably," rather than "blindly," retrospective given government promotion of bond ownership, and policies, such as the Bond Purchase Fund, to protect their prices. In addition, Republican party campaign rhetoric encouraged voters to blame to Democrats for low bond prices in 1920 and to credit Republicans for their recovery in 1924.

[39] On the other hand, Chen and Rahn (2013) find that movements in stock prices affect owners' feelings of economic well-being, sentiments that in turn influence their evaluations of presidential performance. Modern-day citizen investors appear to be pocketbook-oriented even though official encouragement of asset ownership has been through the "submerged state" (Mettler 2011) rather than through overt propaganda. Further research is planned to see whether these evaluations affect electoral choices.

package, the American Reinvestment and Recovery Act (ARRA), was bitterly opposed by Republicans in Congress, in part due to concerns related to increases in the level of federal debt. Some of the rhetoric offered in opposition to additional borrowing was grounded in appeals to the importance of fiscal prudence and thrift. But others focused on concerns regarding potential increases to the cost of government borrowing, and the perception that the federal government risked losing credibility in financial markets. In the 1920s, millions of ordinary voters were themselves the owners of federal debt, and concerns regarding policy measures that had led that debt to lose value (or that could lead them to lose value of adopted) were not abstractions, but genuine pocketbook issues.

In addition to contributing a unique historical perspective to current debates about the impact of asset ownership on political behavior, our paper enriches the study of the political legacies of war. As David Mayhew (2005) reminds us, wars have had significant consequences for the path of American political development, altering both the demand- and supply-side of domestic politics. On the demand-side, wars "generate new ideas, issues, programs, [and] preferences," the effects of which set policy agendas and forge new electoral coalitions. As we have discussed, the need to finance the massive expenditures required for America's participation in the Great War led Treasury Secretary McAdoo to conceive of Liberty Bonds and a new way to market the government's war debt. Their very design embodied a hoped-for policy feedback effect in the form of greater support for the war. However, as we have shown, one unintended consequence of this deliberate policy feedback was to turn citizen investors into Republicans. For liberty loan subscribers, a "return to normalcy" meant something quite specific: bringing the bonds back to par. When they did (and then some), citizen investors decided to stay the course. Our findings, therefore, offer a novel explanation for Republican party dominance in the 1920s.

Policymakers learned lessons, both positive and negative, from the Liberty Bonds experience, and this feedback shaped subsequent programs to sell Treasury debt to average citizens. When the federal debt grew during the Great Depression, then-Treasury Secretary Morganthau introduced "baby bonds" (savings bonds)—government securities sold through the nation's post offices on a continual basis, that were, by design, *nonnegotiable*. These bonds protected investors from price fluctuations, and they could

be redeemed on demand according to a schedule that incentivized longer holding periods (Garbade 2012). The "baby bonds," known formally as Series A, B, C, and D, were described as "a Share in America" (Olney 1971), and Morgenthau, like McAdoo before him, believed that their ownership would increase the attachment of ordinary Americans to their nation (Kimble 2006). The safety of Depression-era "baby bonds" provided the blueprint for the Series E savings bonds used to finance World War II (Morse 1971; Olney 1971). The marketing of Series E bonds replicated the liberty loan drives, including the use of short, concentrated, campaigns, and the mobilization of civil society organizations as a salesforce. To the toolkit inherited from World War I, organizers added the modern medium of radio and hired social scientists to evaluate bond messaging and "segment" the bond-buying public into discrete target audiences (Samuel 1997). But most importantly, the bonds retained the non-negotiability of Morganthau's "baby bonds," protecting the ordinary households that were induced to support the war effort from subsequent fluctuations in interest rates.

References

Achen, Christopher H., and Larry Bartels. 2016. *Democracy for Realists: Why Elections Do Not Produce Responsive Government*. Princeton Studies in Political Behavior. Princeton, NJ: Princeton University Press.

Ansell, Ben. 2014. "The Political Economy of Ownership: Housing Markets and the Welfare State," *American Political Science Review* 108(2): 383-402.

Burner, David. 1968. *The Politics of Provincialism: The Democratic Party in Transition, 1918-1932.* New York: Knopf.

Campbell, Andrea Louise. 2012. "Policy Makes Mass Politics." *Annual Review of Political Science* 15 (1): 333–51. doi:10.1146/annurev-polisci-012610-135202.

Carson, Jamie L. 2013. *Ambition, Competition, and Electoral Reform: The Politics of Congressional Elections across Time*. Legislative Politics and Policy Making. Ann Arbor: The University of Michigan Press.

Case, Karl E., John M. Quigley, and Robert J. Shiller. 2006. "Comparing Wealth Effects: The Stock Market vs. The Housing Market." Cowles Foundation Paper No. 1181. http://cowles.econ.yale.edu.

Chen, Jowei. 2013. "Voter Partisanship and the Effect of Distributive Spending on Political Participation." *American Journal of Political Science* 57 (1): 200–217. doi:10.1111/j.1540-5907.2012.00613.x.

Chen, Jowei and Jonathan Rodden. 2013. "Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures." *Quarterly Journal of Political Science* 8 (3): 239–69. doi:10.1561/100.00012033.

Chen, Phillip, and Wendy M. Rahn. 2013. "What's in Your Wallet? Wealth Effects, Economic Evaluations, and Political Accountability," Working paper.

Clubb, Jerome M., William H. Flanigan, and Nancy H. Zingale. Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972. ICPSR08611-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2006-11-13. http://doi.org/10.3886/ICPSR08611.v1

Cotton, T. Y. C. 1986. "War and American Democracy: Electoral Costs of the Last Five Wars." *Journal of Conflict Resolution* 30 (4): 616–35. doi:10.1177/0022002786030004002.

Cotton Nesler, Natalie C., and Gerald F. Davis. 2012. "Stock Ownership, Political Beliefs, and Party Identification from the "Ownership Society" to the Financial Meltdown" *Accounting Economics and Law* 2(2). doi: 10.1515/2152-2820.1035

Davenport, Tiffany C. 2015. "Policy-Induced Risk and Responsive Participation: The Effect of a Son's Conscription Risk on the Voting Behavior of His Parents." *American Journal of Political Science* 59 (1): 225–41. doi:10.1111/ajps.12117.

Davis, Gerald F., and Natalie C. Cotton. 2007. "Political consequences of financial market expansion: Does buying a mutual fund turn you Republican?" Working paper.

Duca, John V. 2006. "Mutual Funds and the Evolving Long-run Effects of Stock Wealth on U.S. Consumption." *Journal of Economics and Business* 59:202-221.

Duca, John V., and Jason L. Saving. 2008. "Stock Ownership and Congressional Elections: The Political Economy of the Mutual Fund Revolution," *Economic Inquiry* 46(3): 454-79.

Dynan, Karen E. and Maki, Dean M., Does Stock Market Wealth Matter for Consumption? (May 2001). FEDS Discussion Paper No. 2001-23. Available at SSRN: http://ssrn.com/abstract=270190 or http://dx.doi.org/10.2139/ssrn.270190

Eichenberg, R. C., R. J. Stoll, and M. Lebo. 2006. "War President: The Approval Ratings of George W. Bush." *Journal of Conflict Resolution* 50 (6): 783–808. doi:10.1177/0022002706293671.

Eisner, Marc Allen. 2000. *From Warfare State to Welfare State: World War I, Compensatory State-Building, and the Limits of the Modern Order*. University Park, Pa: Pennsylvania State University Press.
Fauvelle-Aymar, Christine, and Mary Stegmaier. 2013. "The Stock Market and U.S. Presidential Approval." *Electoral Studies* 32 (3): 411–17. doi:10.1016/j.electstud.2013.05.024.
Federal Reserve. 1943. *Banking and Monetary Statistics, 1914-41*. Washington DC: Board of Governors of the Federal Reserve System.
Feigenbaum, James. 2016. "Intergenerational Mobility during the Great Depression." Working paper.
Flores-Macías, Gustavo A., and Sarah E. Kreps. 2013. "Political Parties at War: A Study of American War Finance, 1789–2010." *American Political Science Review* 107 (4): 833–48. doi:10.1017/S0003055413000476.
Friedman, Milton. 1957. "The Permanent Income Hypothesis," in Friedman, ed., *A Theory of the Consumption Function.* Princeton: Princeton University Press.
Friedman, Milton and Anna J. Schwartz. 1963. *A Monetary History of the United States, 1867–1960.* Princeton: Princeton University Press.
Gartner, S. S., G. M. Segura, and B. A. Barratt. 2004. "War Casualties, Policy Positions, and the Fate of Legislators." *Political Research Quarterly* 57 (3): 467–77. doi:10.1177/106591290405700311.
Garbade, Kenneth D. 2012. *Birth of a Market: The U.S. Treasury Securities Market from the Great War to the Great Depression*. Cambridge, Mass: MIT Press.
Greenough, Walter Sidney. 1922. The War Purse of Indiana; the five libertyloans and war savings and thrift campaigns in Indiana during the world war. Indianapolis, Indiana Historical Commission.
Grose, Christian R., and Bruce I. Oppenheimer. 2007. "The Iraq War, Partisanship, and Candidate Attributes: Variation in Partisan Swing in the 2006 U.S. House Elections." *Legislative Studies Quarterly* 32 (4): 531–57. doi:10.3162/036298007782398495.
Guiso, Luigi, Haliassos, Michael and Tullio Jappelli. 2003. "Household stockholding in Europe: Where do we stand and where do we go?" *Economic Policy*, 18(36): 123 – 170.
Haines, Michael R., and Inter-university Consortium for Political and Social Research. 2010. Historical, Demographic, Economic, and Social Data: The United States, 1790-2002. ICPSR02896-v3. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2010-05-21. http://doi.org/10.3886/ICPSR02896.v3
Hansen, John Mark. 1991. *Gaining Access: Congress and the Farm Lobby, 1919-1981*. American Politics and Political Economy Series. Chicago: University of Chicago Press.
Hausman, Joshua. 2016. "Fiscal Policy and Economic Recovery: The Case of the 1936 Veterans' Bonus," *American Economic Review*, 106(4): 1100-1143.
Hibbs, Jr. Douglas .A. 2000. Bread and Peace Voting in U.S. Presidential Elections. Public Choice 104 (1): 149-180
Huberty, Mark. 2011. "Testing the ownership society: Ownership and voting in Britain." *Electoral Studies* 30(4):784-794.
Kang, Sung Won, and Hugh Rockoff. 2015. "Capitalizing Patriotism: The Liberty Bonds of World War I." *Financial History Review* 22(1): 45–78.
Karol, David, and Edward Miguel. 2007. "The Electoral Cost of War: Iraq Casualties and the 2004 U.S. Presidential Election." *The Journal of Politics* 69 (3): 633–48. doi:10.1111/j.1468-2508.2007.00564.x.
Key V.O. 1966. *The Responsible Electorate: Rationality in Presidential Voting, 1936–1960*. Cambridge, MA: Harvard Univ. Press
Kramer G.H. 1971. "Short-term fluctuations in U.S. voting behavior." *American Political Science Review* 71:131–43
Kreitzer, R. J., A. J. Hamilton, and C. J. Tolbert. 2014. "Does Policy Adoption Change Opinions on Minority Rights? The Effects of Legalizing Same-Sex Marriage." *Political Research Quarterly* 67 (4): 795–808. doi:10.1177/1065912914540483.

Kennedy, David M. 2004. *Over Here: The First World War and American Society*. 25th anniversary ed. Oxford, [UK] ; New York: Oxford University Press.
Kriner, Douglas L., and Francis X. Shen. 2007. "Iraq Casualties and the 2006 Senate Elections." *Legislative Studies Quarterly* 32 (4): 507–30. doi:10.3162/036298007782398486.
Lewis-Beck, Michael Steven, and Richard Nadeau. 2011. "Economic Voting Theory: Testing New Dimensions." *Electoral Studies* 30 (2): 288–94. doi:10.1016/j.electstud.2010.09.001.
Lewis-Beck, Michael S., Richard Nadeau, and Martial Foucault. 2013. "The Compleat Economic Voter: New Theory and British Evidence." *British Journal of Political Science* 43 (2): 241–61. doi:10.1017/S0007123412000440.
Healy, A. J., N. Malhotra, and C. H. Mo. 2010. "Irrelevant Events Affect Voters' Evaluations of Government Performance." *Proceedings of the National Academy of Sciences* 107 (29): 12804–9. doi:10.1073/pnas.1007420107.
Maki, Dean M. and Michael G. Palumbo. 2001. "Disentangling the Wealth Effect: A Cohort Analysis of Household Saving in the 1990s." FEDS Working Paper No. 2001-23, Board of Governors of the Federal Reserve System.
Megargle, R.H. 1920. Wanted: A Federal Blue Sky Law. Michigan Manufacturer and Financial Record 25 (11):9-10
Mahoney, Paul G. 2003. The Origins of the Blue-Sky Laws: A Test of Competing Hypotheses. The Journal of Law and Economics 46(10:229-251
Mather, O.A. 1922. "Two Issues of Victory Bonds Sell Above Par: War Securities Advance 2 Billions." Chicago Daily Tribune, 13 Jan.
Mayhew, David R. 2005. "Wars and American Politics." *Perspectives on Politics* 3 (3). doi:10.1017/S1537592705050309.
McCarthy, Justin. 2016. "Just Over Half of Americans Own Stocks, Matching Record Low." April 20. http://www.gallup.com/poll/190883/half-americans-own-stocks-matching-record-low.aspx
Mettler, Suzanne. 2011. *The Submerged State: How Invisible Government Policies Undermine American Democracy*. Chicago Studies in American Politics. Chicago: University of Chicago Press.
Mettler, Suzanne, and Joe Soss. 2004. "The Consequences of Public Policy for Democratic Citizenship: Bridging Policy Studies and Mass Politics." *Perspectives on Politics* 2 (1): 55–73. doi:10.1017/S1537592704000623.
Morello, John A. 2001. *Selling the President, 1920: Albert D. Lasker, Advertising, and the Election of Warren G. Harding*. Westport, Conn: Praeger.
Murray, Robert K. 1976. *The 103rd Ballot: The Legendary 1924 Democratic Convention That Forever Changed Politics.* New York: HarperCollins.
Olney, Martha L. 1995. *Saving and Dissaving of 12,817 American Households, 1917-1919*. Amherst, MA: Martha L. Olney, University of Massachusetts [producer], 1993. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]. http://doi.org/10.3886/ICPSR06276.v1
Pacheco, J. 2013. "Attitudinal Policy Feedback and Public Opinion: The Impact of Smoking Bans on Attitudes towards Smokers, Secondhand Smoke, and Antismoking Policies." *Public Opinion Quarterly* 77 (3): 714–34. doi:10.1093/poq/nft027.
Paiella, Monica. 2009. "The Stock Market, Housing, and Consumer Spending: A Survey of the Evidence on Wealth Effects." *Journal of Economic Surveys* 23(5):947-973.
Poterba, James M. 2000. Stock Market Wealth and Consumption. *Journal of Economic Perspectives* 14(2):99-118.
Poterba, James, and Andrew Samwick. 1995. "Stock Ownership Patterns, Stock Market Fluctuations, and Consumption," *Brookings Papers on Economic Activity*, 2: 295-357.
Rahn, Wendy M. and Logan Dancy. 2009. "Interim Report to Russell Sage Foundation. Citizen Investors grant, #83-07-11." Unpublished manuscript, University of Minnesota.

Richardson, Munroe. 2010. *Financial Stocks and Political Bonds: Stock Market Participation and Political Behavior in the United States and Britain*. Ph.D. Dissertation, University of Illinois at Urbana-Champaign.

Saldin, Robert P. 2010. "World War I and the 'System of 1896.'" *The Journal of Politics* 72 (3): 825–36. doi:10.1017/S0022381610000198.

Saldin, Robert P. 2011. *War, the American State, and Politics since 1898*. New York: Cambridge University Press.

Schreiner, Mark and Michael Sherraden. 2006. *Can The Poor Save? Savings and Asset Building in Individual Development Accounts.* New Brunswick, NJ: Transaction Publishers.

Schulman, Bruce J. 2015. Farewell to 'Smoke-Filled Rooms": Parties, Interest, Public Relations, and the Election of 1924." In Gareth Davies and Julian E. Zelizer, eds. 2015. *America at the Ballot Box: Elections and Political History*, pp. 139-152. Philadelphia: University of Pennsylvania Press.

Skocpol, Theda. 2002. *Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States.* Cambridge, MA: The Belknap Press of Harvard University Press..

Skocpol T, Munson Z, Karch A, and B Camp. 2002. "Patriotic Partnerships: Why Great Wars Nourished American Civic Voluntarism". In: Katznelson I., *Shaped by War and Trade: International Influences on American Political Development.* Princeton, NJ: Princeton University Press, pp. 134-80.

Stevenson, Randolph T., and Raymond Dutch. 2013. "The meaning and use of subjective perceptions in studies of economic voting." *Electoral Studies*.

Sutch, Richard. 2015. "Financing the Great War. A Class Tax for the Wealthy, Liberty Bonds for All." BEHLworking paper no. 2015–09.

Sylla, Richard. 2010. "Financial Foundations: Public Credit, the National Bank, and Securities Markets," in Douglas Irwin and Richard Sylla, editors, *Founding Choices: American Economic Policy in the 1790s.* Chicago: University of Chicago Press.

U.S. Treasury. 1921. *Annual Report of the Secretary of the Treasury on the State of the Finances, for the Fiscal Year ended June 30 1920*. Washington: Government Printing Office.

Zelinsky, Edward. 2007. *Origins of the Ownership Society: How the Defined Contribution Paradigm Changed America*. New York: Oxford University Press.

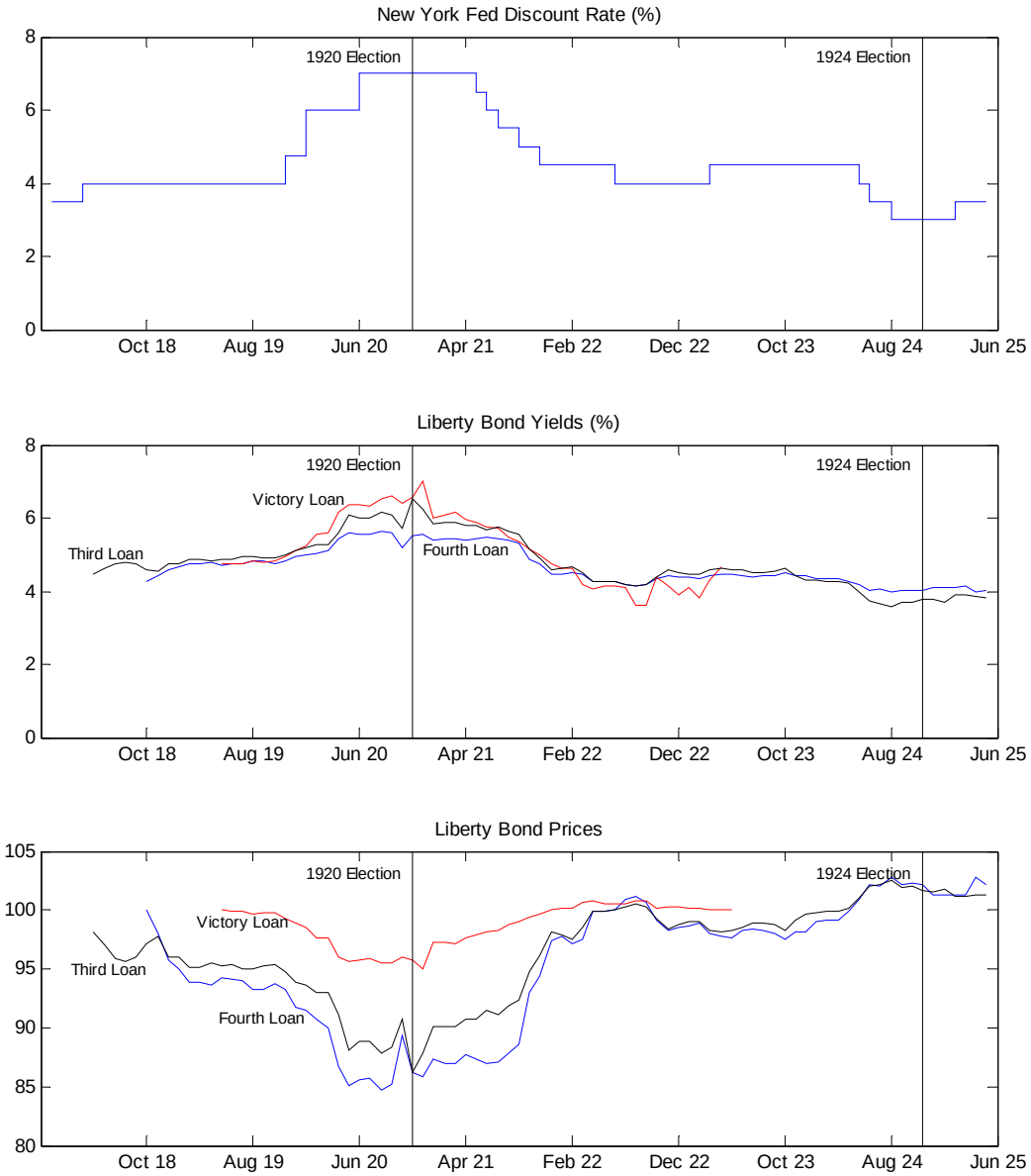
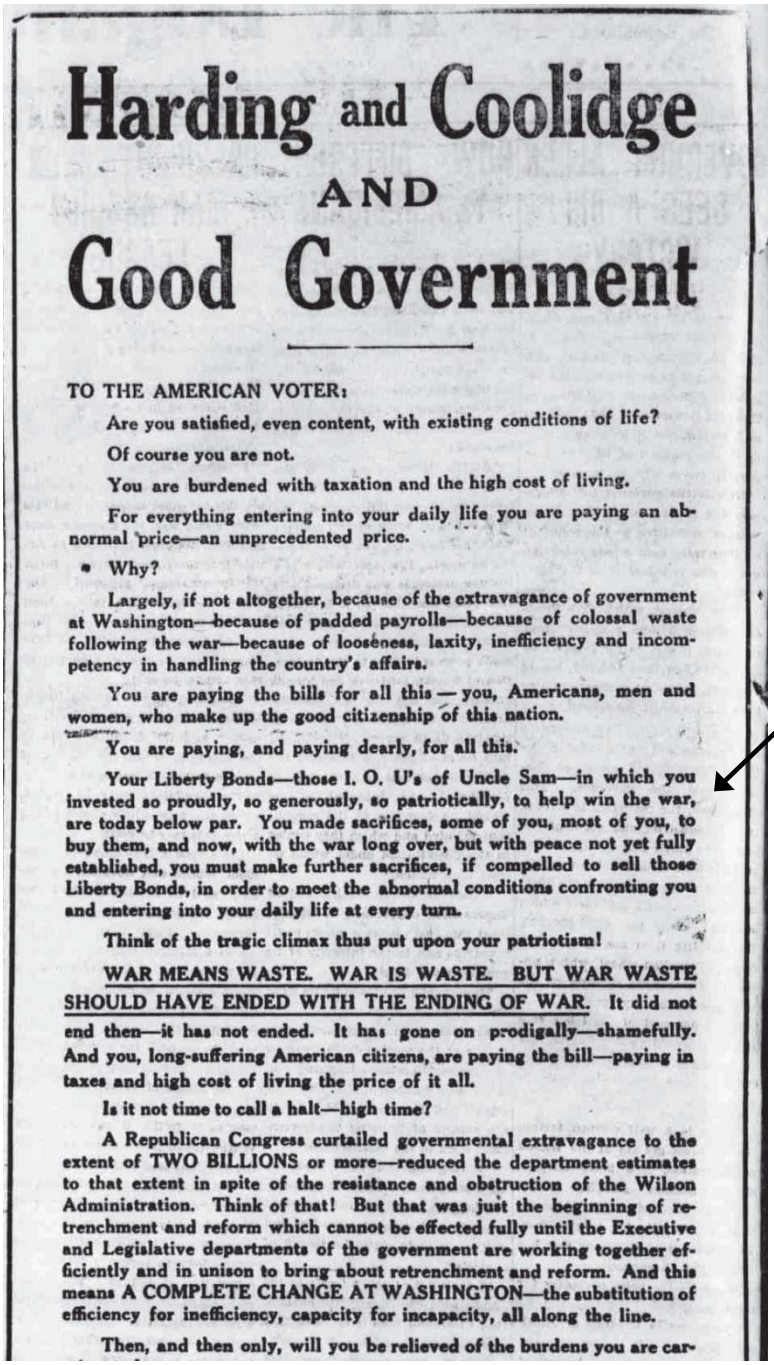


Figure 1:
The Fed's Discount Rate, Liberty Bond Yields, and Liberty Bond Prices

Note: The top panel shows the New York Fed's discount rate, as reported in Federal Reserve (1943). The middle panel reports yields to maturity for the largest liberty bond issues, as calculated from market prices reported in the *New York Times*. The victory loan matured in early 1923. The bottom panel reports the actual market prices of the liberty bonds. Data in the middle and lower panels presented at monthly frequencies.



Harding and Coolidge
AND
Good Government

TO THE AMERICAN VOTER:

Are you satisfied, even content, with existing conditions of life?

Of course you are not.

You are burdened with taxation and the high cost of living.

For everything entering into your daily life you are paying an abnormal price—an unprecedented price.

Why?

Largely, if not altogether, because of the extravagance of government at Washington—because of padded payrolls—because of colossal waste following the war—because of looseness, laxity, inefficiency and incompetency in handling the country's affairs.

You are paying the bills for all this — you, Americans, men and women, who make up the good citizenship of this nation.

You are paying, and paying dearly, for all this.

Your Liberty Bonds—those I. O. U's of Uncle Sam—in which you invested so proudly, so generously, so patriotically, to help win the war, are today below par. You made sacrifices, some of you, most of you, to buy them, and now, with the war long over, but with peace not yet fully established, you must make further sacrifices, if compelled to sell those Liberty Bonds, in order to meet the abnormal conditions confronting you and entering into your daily life at every turn.

Think of the tragic climax thus put upon your patriotism!

WAR MEANS WASTE. WAR IS WASTE. BUT WAR WASTE SHOULD HAVE ENDED WITH THE ENDING OF WAR. It did not end then—it has not ended. It has gone on prodigally—shamefully. And you, long-suffering American citizens, are paying the bill—paying in taxes and high cost of living the price of it all.

Is it not time to call a halt—high time?

A Republican Congress curtailed governmental extravagance to the extent of TWO BILLIONS or more—reduced the department estimates to that extent in spite of the resistance and obstruction of the Wilson Administration. Think of that! But that was just the beginning of retrenchment and reform which cannot be effected fully until the Executive and Legislative departments of the government are working together efficiently and in unison to bring about retrenchment and reform. And this means A COMPLETE CHANGE AT WASHINGTON—the substitution of efficiency for inefficiency, capacity for incapacity, all along the line.

Then, and then only, will you be relieved of the burdens you are car-

"Your Liberty Bonds—these I.O.U.'s of Uncle Sam—in which you invested so proudly, so generously, so patriotically, to help win the war, are today below par. You made sacrifices, some of you, most of you, to buy them, and now, with the war long over, but with peace not yet fully established, you must make further sacrifices, if compelled to sell those Liberty Bonds, in order to meet the abnormal conditions confronting you and entering into your life at every turn.

Think of the tragic climax thus put upon your patriotism!"

Figure 2:
Harding-Coolidge Campaign Advertisement, 1920

This ad was printed in a large number of American newspapers in October 1920. It has been excerpted here to make it legible.

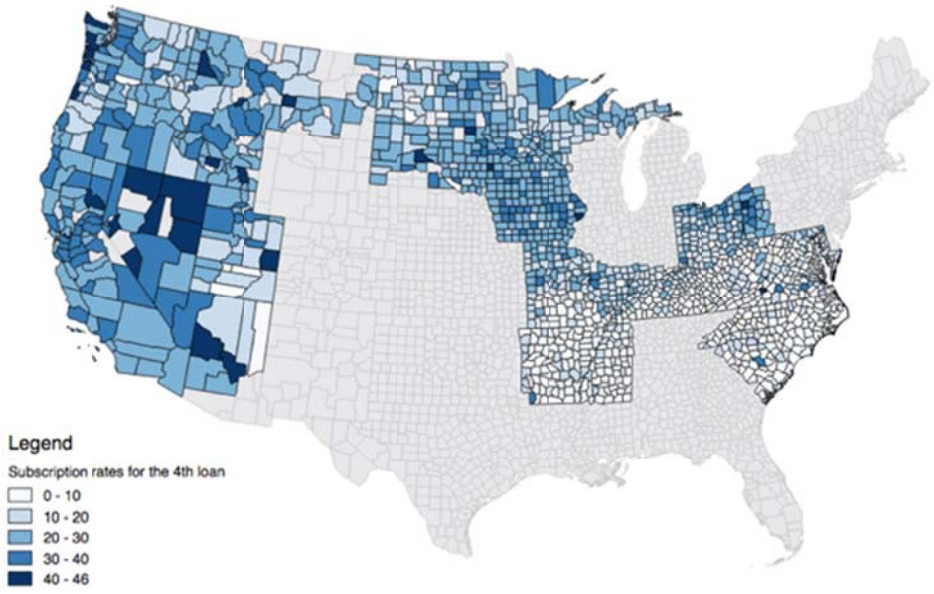


Figure 3:
Subscription Rates, Fourth Liberty Loan

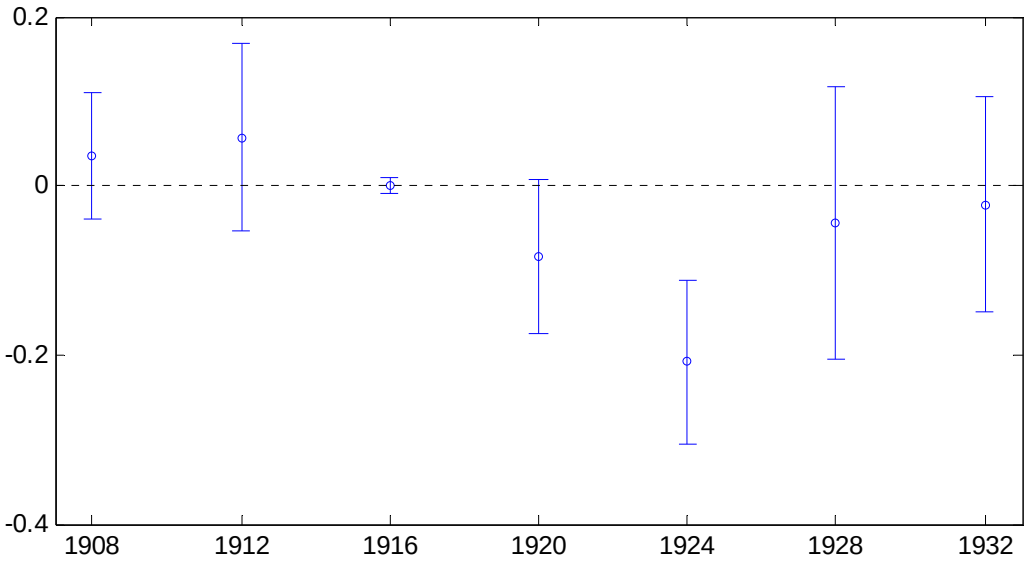


Figure 4:
Estimated Effect of Liberty Bond Participation on the Democratic Vote Share, 1908-32

The figure presents estimates of the effect of a county's liberty bond participation rate on the Democratic Party vote share in presidential elections, as estimated from a regression of the form: $demshare_{ist} = \alpha_i + \gamma_{st} + \sum \delta_t libloanparticip_i \times year_t + \beta \boldsymbol{X}_{it} + \varepsilon_{it}$, where α_i is a county fixed effect, γ_{st} is state-by-year fixed effects, and the $libloanparticip_i \times year_t$ terms are interactions between the county's liberty loan participation rate and election years, with the excluded year being 1916. The figure plots the δ_t values and their 95 percent confidence intervals.

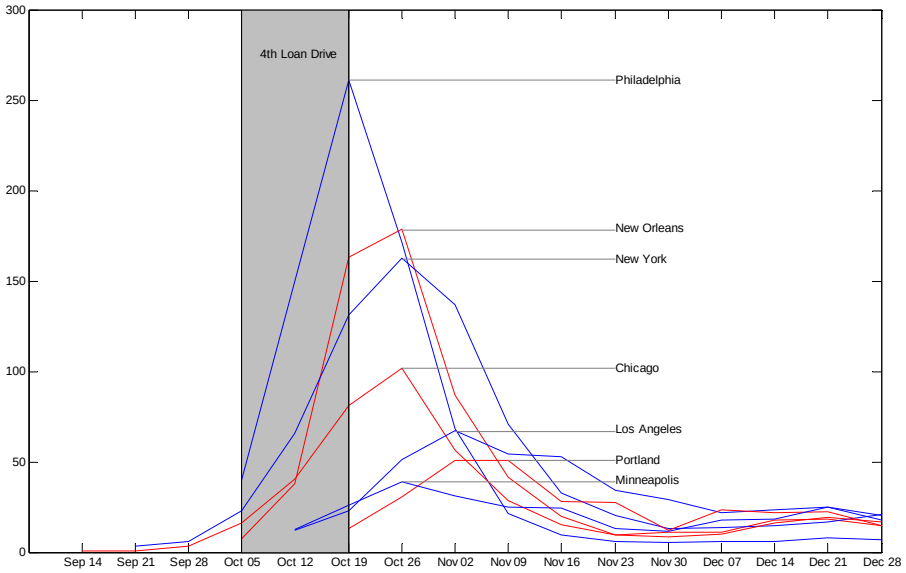


Figure 5: Weekly Deaths Per 100,000 Residents from Influenza and Pneumonia, 14 September - 28 December 1918

The figure plots the number of deaths each week from influenza and pneumonia relative to the city's July 1 1918 estimated population, per 100,000 residents, for seven cities. Deaths from the 1918 influenza were associated with acute bronchial pneumonia; thus deaths from pneumonia are also included. The line for each city is labeled at the point of its peak death rate. The first data point for each city corresponds to the first week during which influenza is reported as a cause of death. The raw data are from US Bureau of the Census (1917-1920), and also reported in Ministry of Health (1920) and Crosby (2003).

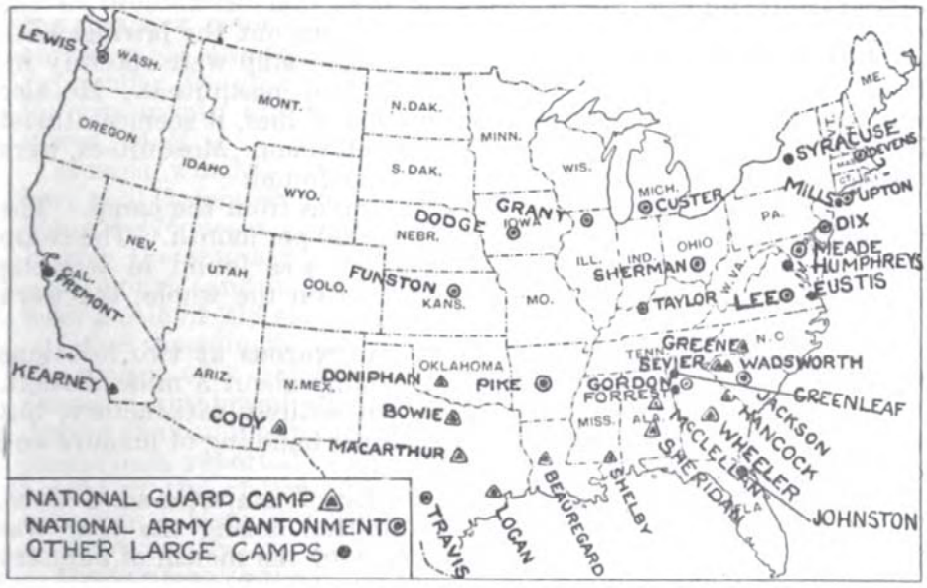


Figure 6: Location of World War I Military Camps
Source: US War Department (1920: 1519).

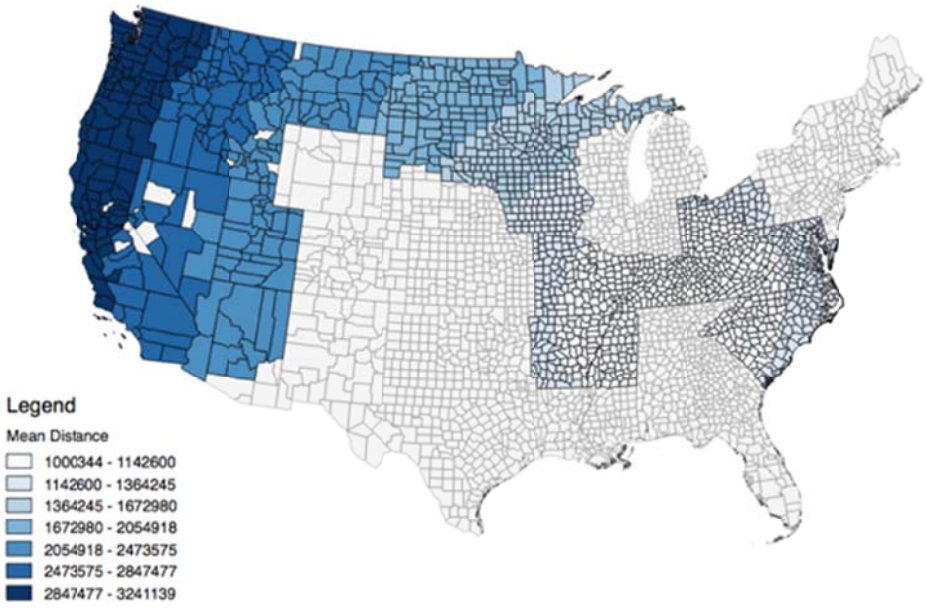


Figure 7: Average Distance to Military Camps Among Sample Counties

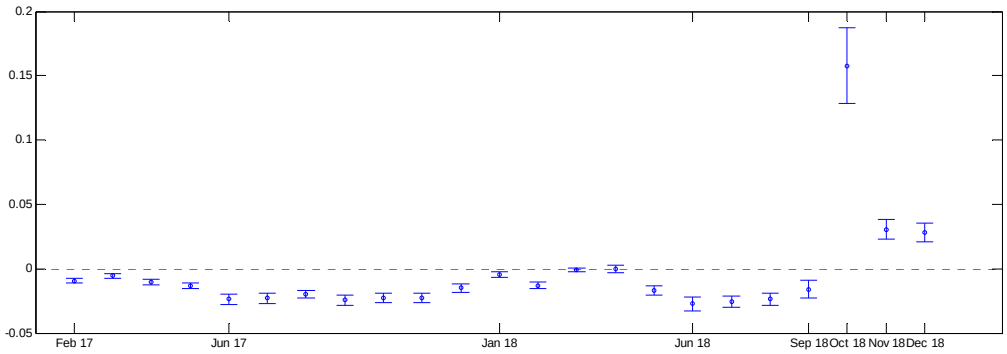


Figure 8: Estimated Effect of Distance to Military Camps on Mortality, 369 Counties, January 1917-December 1918

The figure presents estimates of the effect of average distance from military camps on monthly mortality rates, as estimated from a regression of the form: $d_{it} = \alpha_i + \sum \theta_t Dist_i \times month_t + \varepsilon_{it}$, where α_i is a county fixed effect, and $Dist_i$ is the county's average distance to military camps. The estimated θ_t coefficients, along with error bars representing 95 percent confidence intervals, are presented, and represent differences relative to the excluded month of January 1917.

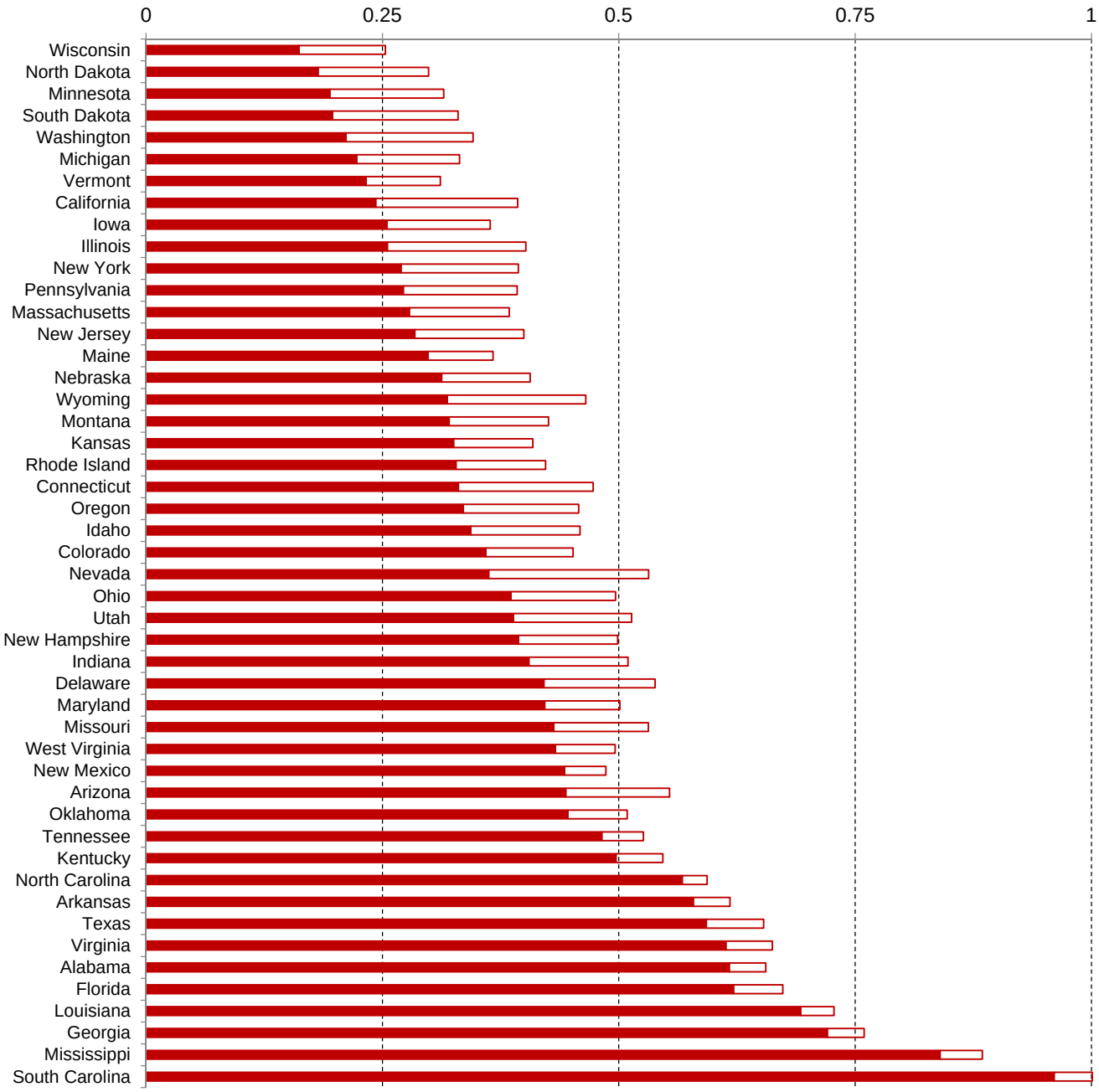


Figure 9: Actual and Counterfactual Democratic Party Vote Shares, 1920

Table 1:
Liberty Loan Characteristics and Subscriptions, by Loan

	First	Second	Third	Fourth	Victory
		A. Bond Characteristics			
Coupon rate	3.50%	4.00%	4.25%	4.25%	3.75% or 4.75%
Dated	Jun 1917	Nov 1917	May 1918	Oct 1918	May 1919
Maturity (years)	30	25	10	20	4
Income tax exemption	Full	Normal, Corporate	Normal, Corporate	Partial	Full or Partial
Conversion option	Yes	One time only	None	None	None
		B. Subscriptions			
Total Subscriptions (Bill. $)	2.000	3.809	4.177	6.959	4.500
Number of subscribers (Mill.)	4	9.4	18.4	22.8	11.8
Mean Subscription Amount ($)	759	491	227	306	445

Note: the first and second loans could be converted into subsequent loans bearing higher coupon rates Their initial rates are reported here. In addition, some of the victory loan bonds were issued at a lower coupon rate. *Sources*: Annual Reports, U.S. Treasury; Garbade (2012).

Table 2:
One-Year Returns to Holding Liberty Bonds at the Time of the Presidential Election Campaigns of 1920 and 1924

	4th Loan	
	1-Year Return	Diff. vs. Yield at Issue
	(1)	(2)
September 15, 1920	-4.08%	-8.33%
September 15, 1924	8.54%	+4.29%

Note: This table presents one-year Holding Period Returns (HPRs) for the calendar year up to the given dates, which fall about a month and a half prior to the elections (the election dates are 2 Nov. 1920 and 4 Nov. 1924). If we define P_{t-1} as the price one year earlier, C as the annual coupon payments, and P_t as the price on the day before the election, the HPR is defined as $(P_t - P_{t-1} + C)/P_{t-1}$: it is the coupon rate plus the capital gains or losses experienced over the year.
Source: Authors' calculations from price data reported in the *New York Times*.

Table 3:
Summary Statistics, County Dataset

	Mean	SD	Min	Max
Participation rate, 4th Loan	20.671	11.120	0.715	46.433
Home ownership rate, 1920	0.492	0.138	0.076	0.861
Banks per square mile, 1920	0.001	0.001	0	0.006
Fraction residing in major urban areas, 1920	0.255	0.371	0	1
Log(population), 1920	10.979	1.409	5.991	13.986
Agricultural workers per capita, 1920	0.336	0.258	0	1.034
Suspended bank deposits per capita, 1920	0.002	0.009	0	0.162
Farm tenants per capita, 1920	0.121	0.142	0	0.831
Democratic vote share:				
1916	54.089	16.073	8	100
1920	41.063	21.607	4.2	100

Note: all statistics weighted by 1920 county population.

Table 4:
Effect of Liberty Loan Participation on Electoral Outcomes, 1908-32: Baseline Results

	(1)	(2)	(3)	(4)
Post-1918 x				
Participation in 4th Liberty Loan	-0.120**	-0.089*	-0.112**	-0.107**
	(0.037)	(0.041)	(0.034)	(0.038)
Fraction in Major Urban Areas	-3.820**	-2.438*	-3.336**	-2.906**
	(0.975)	(0.995)	(0.924)	(0.996)
Home Ownership Rate	-13.141**	-16.311**	-14.500**	-11.409**
	(2.258)	(2.557)	(2.138)	(2.479)
Agricultural Workers Per Capita		5.504**		
		(1.638)		
Suspended Bank Deposits (1920)			-41.153*	
			(16.803)	
Fraction Farm Tenants				5.800*
				(2.431)
Constant	72.911**	71.616**	73.305**	70.851**
	(1.497)	(1.529)	(1.408)	(1.814)
Observations	9,855	9,855	9,698	9,855
R-squared	0.957	0.957	0.957	0.957
County FE	YES	YES	YES	YES
State x Year FE	YES	YES	YES	YES

Note: this table presents OLS regressions of the effect of liberty loan participation on the Democratic Party vote share in presidential elections, in a panel of counties. All regressions weighted by 1920 county population. Robust standard errors clustered by county presented in parentheses. ** p<0.01, * p<0.05, + p<0.1

Table 5:
"First Stage" Regressions of the Relationship between
Distance to Camps and Participation in the Fourth Loan

	Baseline	County Controls	Drop South	Falsification: Participation in Third Loan
	(1)	(2)	(3)	(4)
Mean Distance to Camps	0.013**	0.012**	0.014**	0.004
	(0.004)	(0.004)	(0.004)	(0.004)
Fraction in Major Urban Areas	12.917**	3.234*	2.910+	3.413*
	(1.596)	(1.412)	(1.660)	(1.499)
Home Ownership Per Capita		-2.681	-4.092	1.628
		(2.992)	(6.359)	(3.892)
Banks (000s) Per Square Mile		3,738**	4,330**	3,839**
		(576)	(726)	(432)
Agricultural Workers Per Capita		-13.889**	-16.231**	-10.391**
		(1.557)	(3.959)	(1.899)
Log(Population)		1.439+	1.284	0.214
		(0.707)	(0.819)	(0.633)
Constant	-2.014	-10.095	-8.497	5.675
	(5.988)	(10.789)	(13.502)	(11.193)
Observations	1,426	1,407	897	1,041
F stat, Mean Distance	11.0	10.66	12.71	1.39
R-squared	0.735	0.799	0.644	0.757
State FE	YES	YES	YES	YES

Note: This table presents cross-sectional regressions of the determinants of county-level participation In the fourth Liberty Loan. (This is the cross-sectional analog of the first-stage regressions in the panel specifications presented below.) All regressions weighted by 1920 population. Robust standard errors clustered by state presented in parentheses. ** p<0.01, * p<0.05, + p<0.1

Table 6:
Influenza, Distance to Camps, and the Fourth Loan Campaign,
By Reserve District

Reserve District	Population-Weighted Distance (km)
Influenza Not Mentioned as Impairing Campaign	
New York	1,446
Cleveland	1,140
Atlanta	1,127
Chicago	1,218
Minneapolis	1,683
Dallas	1,430
San Francisco	2,840
Average:	1,555
Influenza Mentioned as Impairing Campaign	
Boston	1,674
Philadelphia	1,353
Richmond	1,155
St Louis	1,091
Kansas City	1,429
Average:	1,340

Note: this table presents the population-weighted average distance of the counties in each reserve district to the military camps, and compares the districts where influenza was specifically mentioned as a hindrance to the fourth loan campaign to those where influenza was not mentioned, in an official statement of the campaign's progress as of October 17.

Table 7:
Effect of Liberty Loan Participation on Electoral Outcomes, 1908-32: IV Results

	OLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
	(1)	(2)	(3)	(4)	(5)
Post-1918 x					
Participation in 4th Liberty Loan	-0.120**	-0.299*	-0.293+	-0.254+	-0.304*
	(0.037)	(0.148)	(0.150)	(0.152)	(0.143)
Fraction in Major Urban Areas	-3.820**	-2.049	-1.289	-1.936	-1.474
	(0.975)	(1.739)	(1.336)	(1.775)	(1.375)
Home Ownership Rate	-13.141**	-15.271**	-16.909**	-16.007**	-14.555**
	(2.258)	(3.241)	(2.684)	(3.069)	(3.837)
Agricultural Workers Per Capita			2.639		
			(2.287)		
Suspended Bank Deposits (1920)				-37.139**	
				(14.117)	
Fraction Farm Tenants					2.884
					(3.317)
Observations	9,855	9,854	9,854	9,697	9,854
R-squared	0.957	0.849	0.849	0.851	0.849
County FE	YES	YES	YES	YES	YES
State x Year FE	YES	YES	YES	YES	YES
Number of counties		1,426	1,426	1,403	1,426
			First-Stage Regressions:		
Post-1918 x					
Mean Distance to Military Camps		0.016**	0.015**	0.014**	0.016**
		(0.003)	(0.003)	(0.003)	(0.003)
Fraction in Major Urban Areas		9.460**	5.225**	9.439**	6.682**
		(1.118)	(1.268)	(1.072)	(1.167)
Home Ownership Rate		-12.973**	-4.058	-11.756**	-17.178**
		(2.469)	(2.959)	(2.232)	(2.773)
Agricultural Workers Per Capita			-13.789**		
			(1.709)		
Suspended Bank Deposits (1920)				28.608	
				(19.745)	
Fraction Farm Tenants					-15.360**
					(2.418)
Kleibergen-Paap F statistic		26.54	20.65	24.56	29.29
R-squared		0.942	0.947	0.945	0.944
County FE		YES	YES	YES	YES
State x Year FE		YES	YES	YES	YES
Number of counties		1,426	1,426	1,403	1,426

Note: this table presents OLS and IV regressions of the effect of liberty loan participation on the Democratic Party vote share in presidential elections, in a panel of counties. The instrument for liberty loan participation is the mean distance of a county to military camps, a determinant of the severity of the 1918 influenza epidemic. All regressions weighted by 1920 county population. Robust standard errors clustered by county presented in parentheses. ** p<0.01, * p<0.05, + p<0.1

Table 8:
Effect of Liberty Loan Participation on Electoral Outcomes, 1908-32—State Data

	OLS	IV-2SLS
	(1)	(2)
Post-1918 x		
Participation in 4th Liberty Loan	-0.235*	-0.447*
	(0.098)	(0.219)
Fraction in Urban Areas	0.040	0.099
	(0.030)	(0.071)
Observations	334	334
R-squared	0.892	0.653
State FE	YES	YES
Year FE	YES	YES
Number of states	48	48
		First Stage
Post-1918 x		
Population-Weighted Distance to Military Camps		0.00005**
		(0.00001)
Fraction in Urban Areas		0.257**
		(0.043)
Kleibergen-Paap F		17.24
R-squared		0.959
State FE		YES
Year FE		YES

Note: this table presents OLS and IV regressions of the effect of liberty loan participation on the Democratic Party vote share in presidential elections, in a panel of states. The instrument for liberty loan participation is the mean population-weighted distance of a state to military camps, a determinant of the severity of the 1918 influenza epidemic. All regressions weighted by 1920 state population. Robust standard errors clustered by state presented in parentheses. ** p<0.01, * p<0.05, + p<0.1