The Fed, the Treasury, and the Liberty Bond Campaign – How William Gibbs McAdoo Won World War I

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Note: The body of this paper has been written to be accessible and interesting to the non-economist. I have deliberately kept formal statistics and theoretical pyrotechnics to a minimum. Because the conference has a scholarly format, I have added an "Addendum for Economists." A data appendix is available from the author on request.

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Abstract

William Gibbs McAdoo played a pivotal role in the founding and design of the Federal Reserve System. As President Woodrow Wilson's Secretary of the Treasury he helped draft the bill creating the Fed and, outmaneuvering critics, he steered it through Congress. When the United States entered the World War in 1917 it was immediately evident that an unprecedented effort to divert productive capacity toward fulfilling military demands would be required. McAdoo was given the responsibly to devise a plan to pay for the war. The Secretary of Treasury was by statute *ex officio* Chairman of the Federal Reserve Board (that provision was ended in 1936). McAdoo turned the Fed into a tool of the war-time Treasury and involved it directly in his plan for war finance.

Against the advice of most economists of his time, he chose a mix of taxation and the sale of war bonds. He introduced a sharply progressive income tax schedule. To raise the balance needed McAdoo conceived of the Liberty Loan plan. It had three elements. (1) The public would be educated about bonds, the causes and objectives of the war, and led to appreciate the financial power of the country. (2) The government would appeal to patriotism and ask everyone – businessmen, workmen, farmers, bankers, millionaires, school-teachers, laborers, housewives and children – to do their part by reducing consumption and purchasing bonds. (3) The entire effort would rely upon volunteer labor. The men and women who could not go into military service would constitute a "financial front … the economic equivalent of the military front."

I argue that the Liberty Bond Campaign was a great success. It temporarily increased the national saving rate above the steady-state level implied by the life-cycle hypothesis and moderated the war-time price inflation.

Any great war must necessarily be a popular movement. It is a kind of crusade; and like all crusades, it sweeps along on a powerful stream of romanticism.

William Gibbs McAdoo

On October 25, 1917 a large three-engine biplane, a Caproni Bomber, piloted by a lieutenant in the Royal Italian Flying Corps, flew over New York's 59th Street Bridge at 4,000 feet, continued on to Fifth Avenue, reduced altitude and proceeded downtown where it circled Washington Square Park three times before returning up Fifth Avenue to Central Park. It flew so low that those on the top reaches of the Woolworth Building (792 feet) could look down on the aircraft [*Air Service Journal* 1917: 531]. The point of this stunt was to attract a crowd and attract the crowd's attention (few Americans had yet seen an airplane in flight); and, incidentally, to remind New Yorkers of Italian descent that Italy had switched sides and was now an ally in the war against Germany. The United States had entered the war in April.

As the Caproni flew she dropped paper "bombs" inscribed "A Liberty Bond in your home will keep German bombs out of your home" [*New York Times* 26 October 1917: 2]. It was Liberty Day and the goal was to promote the sale of war bonds in the drive for the Second Liberty Loan. According to the *New York Times* 20,000 or more marched in the parade. The Liberty Loan Committee walked in "double rank, with Benjamin Strong, Governor of the Federal Reserve Bank, and J. P. Morgan among them. They were followed by the staff of the Liberty Loan Committee offices, including 250 girls in white aprons." Later in the day a captured German U-boat was rechristened "U-Buy-a-Bond."[1]

{Figure 1}

Responsibility for formulating the financial war plan fell to William Gibbs McAdoo, President Woodrow Wilson's Secretary of the Treasury. He was not a financier; but a prominent New York attorney, a visionary entrepreneur, and a successful railroad executive. As an entrepreneur he designed, directed, and drove the "McAdoo Tunnels" under the Hudson River.

[1] The Liberty Day celebrations in New York are described in the *Air Service Journal* [1917: 531], the Aerial Age Weekly [1917: 325], and the *New York Times* [26 October 1917: 2].

The project took six years, from 1902 to 1908. These arteries connecting Manhattan with New Jersey by rail are still in use and are now known as the PATH tunnels (Port Authority Trans-Hudson).[2]

McAdoo was chosen for the cabinet because he had Wilson's confidence. In 1912 he had taken direction of Wilson's campaign for the presidency. He was, like Wilson, a progressive Democrat and despite friendships and business dealings with New York bankers and other Wall Streeters, he considered himself "an outsider in the community of interest known as Big Business" [McAdoo 1931: 110, 178]. In office he proved to be an excellent politician, perhaps because he was personable, energetic, and ambitious, but also because he was unencumbered by rigid theories [Johnson 2010: 34]. The president of one of the big railroads once said: "If you ever let McAdoo talk to you for fifteen minutes, you won't protest against anything. He'll get you, body and breeches, and all you'll be thinking about when you come away will be what a nice call you have had and what a fine fellow McAdoo is" [*New York Times* 23 November 1918: 2].

{Figure 2}

One of his immediate jobs as Treasury Secretary was to bring the Federal Reserve System into being. The Fed was to be America's central bank, a "lender of last resort." It was established in response to the frightening banking panic of 1907 and designed to prevent a similar financial collapse in the future. Wilson signed the Federal Reserve Act in December of 1913. McAdoo had played a major role in drafting the Fed bill, outmaneuvering its critics, and steering it through Congress.[3] The legislation had been strongly opposed by the big-city banks. They wanted a powerful centralized system, directed from New York, and governed entirely by

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[2] For a detailed discussion of the construction of the McAdoo tunnels see Joseph Brennan [2005: Chapter 22].

[3] McAdoo's account of the beginnings of the Federal Reserve is related in Chapter 15 of his memoir [1931: 219-236]. The banker Paul Warburg and Senator Nelson Aldrich (R, Rhode Island) are generally given credit for defining and promoting the idea of an American central bank. Senator Robert Owen (D, Oklahoma), a Cherokee citizen, and Representative Carter Glass (D, Virginia) were the bill's congressional sponsors. McAdoo, however, declared the view that Warburg played a central role "completely erroneous" and the idea that Aldrich should be regarded as the "Father of the Federal Reserve" "an amusing specimen of ignorance." He implicitly gives Glass and Owen, and explicitly Wilson, the credit [pp. 281-283, 515]. Whatever claims each of these men might legitimately have, it was McAdoo who proved to be the ace in this deck [Craig 2013: 102, Wilkerson 2013].

bankers. Perhaps because of this opposition, many of the specifics were not spelled out in the legislation. The task of hammering out those details was delegated to McAdoo and the Secretary of Agriculture, David F. Houston, an economic historian. The law required that the nation be divided into districts, each with its own Federal Reserve Bank. But, the boundaries of the districts, the location of the banks, and even the number of districts (between eight and twelve) were left to McAdoo and Houston. New York made its argument for an enormous district centered in New York with seven lesser districts as subordinates. McAdoo and Houston snubbed Wall Street and created a less-centralized and more-balanced system of twelve districts controlled by a presidentially-appointed Federal Reserve Board located in Washington DC, not by the New York bank operating independently. New York was furious.[4]

McAdoo's role in the creation of the Federal Reserve would seem "providential" once the U.S. entered the war [*Washington Post* 1 May 1917]. The Secretary of Treasury was by statute *ex officio* Chairman of the Federal Reserve Board (that provision was ended in 1936). The Board's offices and staff were initially housed in the Treasury Building. With this proximity and his intimate connection with the other members of the Board, McAdoo was able to turn the Fed into a tool of the war-time Treasury and involve it directly in his plan for war finance [Strong 1921: 503]. He would need that help.

McAdoo, as Treasury Secretary, quickly established a reputation for bold and decisive action executed with great audacity. When World War broke out in late July of 1914 it precipitated a financial panic in Europe and a Treasury crisis in the United States. The U.S. did not enter the war for three more years but the Treasury could not ignore the situation in Europe. Europeans immediately began to dump American stocks they owned and to redeem the proceeds

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[4] Robert Johnson offers a brief reliable account of the founding and early days of the Federal Reserve System [2010]. A more technical policy history of the period is offered by Michael Bordo and David Wheelock [2011]. Kris Mitchener provides a description of the process of drawing the Federal Reserve District boundaries [2011]. Sarah Binder and Mark Spindel describe the politics of the Reserve Bank Organization Committee [2011]. Also see the committee's report [1914]. McAdoo wrote a detailed but highly readable and engaging memoir, published in 1931. He was helped by an able ghostwriter, the biographer and novelist William E. Woodward. Douglas Craig is McAdoo's biographer [2013]. The Panic of 1907 is the subject of a centennial history written by Robert F. Bruner and Sean D. Carr [2007].

in gold. Stock prices on the New York market took the largest one-day dive since 1907. That was not the problem. What worried McAdoo was the gold pouring out of the country as anxious Europeans repatriated their investments. America was still on the gold standard with dollars backed at the fixed exchange of $20.67 per fine ounce of gold. Anyone holding dollars could convert them into gold at the U.S. Treasury at that price. With a fractional reserve system, however, the Treasury's gold stock could have been rapidly depleted. One solution would be to suspend the ability to exchange dollars for gold, that is, for the U.S. to leave the gold standard. Ironically, it was precisely the fear that the dollar would soon prove inconvertible, that fed the rush to liquidate stocks. However, McAdoo believed that leaving gold would weaken America's financial credibility at a time just before the Federal Reserve System with its new currency, Federal Reserve Notes, was up and running.

To save the day, McAdoo asked banker J. P. Morgan, son and successor of J. Pierpont Morgan, to close the stock market. It was an unprecedented, courageous, and audacious request. Morgan, perhaps more worried about a collapse of stock prices than McAdoo, closed the exchange that very day, July 31, 1914. The market remained closed until December and then only opened on a restricted basis. Unable to sell stocks Europeans could not obtain claims on the Treasury's gold. Yet, by adhering to the gold standard when the rest of the world suspended convertibility on account of war, the American dollar became the most secure currency in the world. Consequently, the gold outflow soon reversed and became a strong inflow (that would also complicate things, as we will see). The impact was permanent. After the war, the world would shift from a monetary standard based on the English pound to one based on the American dollar.[5] The dollar has remained the world's standard ever since.

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[5] On the closing of Wall Street consult William Silber [2007]. The *New York Times* reported on July 31 [page 1] that the bankers meeting in New York were opposed to closure and on the next day [1 August 1914: 1] that the bankers had closed the stock exchange, the cotton exchange, and the coffee exchange. Morgan's role is discussed by Ron Chernow [1990: chapter 10]. McAdoo did not reveal his role in the crisis until 1931 [1931: 290]. Barry Eichengreen explains the war-time disintegration of the gold standard and the reversal from an outflow of gold to an inflow [1992: chapter 3]. To avoid the hazards of shipping gold over contested ocean, gold destined for England was actually sent to Ottawa for safe keeping. The shutdown of the exchange exposed the financial system to the risk of a liquidity shortage. Margaret Jacobson and Ellis Tallman describe how the demand for bank liquidly was met [2013]. McAdoo also played a prominent part in that story. Four days after the European war began he asked and obtained special powers to issue one-half billion dollars of emergency currency.

In his personal life, McAdoo had demonstrated a similar capacity for audacity. He courted the President's 24-year-old daughter Eleanor, who was engaged to another man. McAdoo was twice her age, widowed with six children, and in office less than year. The *New York Times* coyly described the courtship:

> Both Miss Wilson and Mr. McAdoo are fond of dancing, and they were constant partners at dances that they were attending. In spite of his half century, Mr. McAdoo is as trim and agile as a youngster of 25 and dances with all the enthusiasm and enjoyment of a youth. … Mr. McAdooo [sic] was told by his physician that he must have more exercise and diversion, and dancing was suggested as a means to that end. Mr. McAdoo has been a scrupulous observer of his physician's orders. [14 March 1914: 1]

The couple married in the Blue Room of the White House in May [McAdoo 1931: 276].

McAdoo had a reputation for audacious self-confidence bordering on recklessness that preceded his appointment as Secretary. He once inspected a New York skyscraper he had commissioned when the building was still a steel skeleton. It was to be the largest office building in the world. He ascended to the twenty-second story standing on a girder clasping only the chain which hoisted him upward. An enormous crowd collected below to watch the spectacle. It was also reported that he had escaped death three times in automobile mishaps and was once arrested for racing with a railroad train "to see which would have the right-of-way over a crossing" [Hendrick 1913: 628].

McAdoo's capacity for decisive action and his independence from Wall Street would serve him well as he formulated a fiscal plan to finance the war. His solution was bold, blatant, brilliant. With it he demonstrated, in the words of a *Washington Post* editorial, a "remarkable breadth of vision, moral courage, and sound judgment" [May 1, 1917: 6].[6]

When the United States entered the World War in 1917 it became immediately evident that an unprecedented effort to divert productive capacity toward fulfilling the demands of the military would be required. At the time of the congressional declaration of war, the American

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[6] Russell Leffingwell, Assistant Secretary of the Treasury, provides a history of financing during World War I [1920]. Also see the treatment by Charles Gilbert [1970].

economy was operating at full capacity. The war-time population would have to pay the bill with taxes or loans since ships, guns, and bullets cannot be magically teleported from the future. As an avowed neutral, Wilson had made no effort to stockpile weapons or amass a war chest. In Paul Samuelson's famous textbook simplification it came down to a choice between producing guns or butter [1948: 17-20]. McAdoo understood the point.[7] Shortly after war had been declared he delivered a speech which he later recorded for posterity:

> Every man and woman who stays at home, and for whose liberties, property, and sacred institutions our boys will shed their blood, must be moved by a spirit of sacrifice equal to that which animates our gallant troops. We must be willing to give up something of personal convenience, something of personal comfort, something of our treasure – all, if necessary, and our lives in the bargain, to support our noble sons who go out to die for us. [McAdoo 1917]

But the question remained: how would the shift in output be arranged? How should the war be paid for? There were three possibilities to consider: taxation, borrowing, and printing money.

Printing money was off the table from the beginning. The experience with printed "greenbacks" during the Civil War suggested that fiat money would produce a general inflation. If there had been any doubt on this matter, it was dispelled with a massive quantitative study by the Berkeley economist Wesley Clair Mitchell. Mitchell not only connected printed money with the inflation, but cataloged inflation's deleterious consequences [1903, 1908]. Printing money and inflation, however, could have worked – it would have worked – had McAdoo taken that route. The government could use newly-printed currency to purchase military goods. Transactions would have to be at prices sufficiently high to induce producers to switch away from consumer goods. The resulting shortage of civilian goods would send up prices of everyday commodities. A general inflation of prices and wages would result.

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[7] Wilson did not. He apparently thought that borrowing shifted the burden into the future while taxation did not. He sought an "equitable" balance between the present and the future. He also thought that borrowing would produce inflation [Wilson 1917: Sixty-Fifth Congress, 1st Session, Senate Document No. 5].

McAdoo had another objection to printing money. This method hid the costs of war from the public and he wanted the public to be engaged and committed. "Any great war must necessarily be a popular movement," he thought, "… a kind of crusade" [McAdoo 1931: 374].

McAdoo chose a mix of taxation and the sale of war bonds. The original idea was to finance the war one half with taxes and one half with borrowing [McAdoo 1931: 384]. Taxation would work directly and transparently. Taxes are compulsory and those who must pay are left with less purchasing power. Their expenditures will fall, freeing productive resources (labor, machines and factories, raw materials) to be employed in support of the war. The impact on the price level would be minimal. Another advantage of taxation is that Congress can set the schedule of tax rates (and create any exemptions deemed appropriate) to target those they think should bear the greatest burden. President Wilson and the Democrats in Congress insisted on a sharply progressive schedule. The highest marginal rate eventually reached 77 percent on 1918 incomes over $1 million. Yet even then, because of generous exemptions, only about 12 percent of American households would pay taxes.[8] The lowest tax rate, for incomes less than $5,000, was zero. For incomes between $5,000 and $6,000 the marginal rate on earnings over $5,000 was 13 percent. A prominent economist of the time and a leading proponent of progressive taxation, Edwin Seligman of Columbia University, was astonished, calling the rates unprecedented "in the annals of civilization." Nevertheless, he could brag:

> In comparing our present income tax with the British … it is to be noted that our rates are much higher on the larger incomes and much smaller on the lower and moderate incomes. The American scale is an eloquent testimony to the fact not only that large fortunes are far more numerous here than abroad, but also that there is greater appreciation of the democratic principles of fiscal justice [Seligman 1918: 18-19].

Accompanying the personal income tax was an increase in the corporate income tax, an entirely new "excess-profits tax," and excise taxes on such "luxuries" as automobiles, motor cycles, musical instruments, talking machines, picture frames, jewelry, cameras, riding habits, playing cards, perfumes, cosmetics, silk stockings, proprietary medicines, candy, and chewing gum.

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[8] Carter et al. [2006: Series Ae1 and Ea749], but also see Seltzer [1968: Table 9, p. 62], who put the percentage of the population covered at about 8 percent.

{Figure 3}

One of the lasting consequences of the war taxes and the bureaucratic apparatus that came with them was that it established a strong fiscal capacity: the state's ability to raise revenue from taxes [Besley and Persson 2008, 2009].

Most of the prominent economists of the day suggested that the war should be paid for entirely through such taxes [Gilbert 1970: 86-87, Kang and Rockoff 2006: 6-10, Rockoff 2013]. McAdoo disagreed. The chief disadvantage of a full reliance on taxation, in McAdoo's view, was that the eventual cost of war was unknown at the outset. "There were so many uncertain factors in the problem that a definite conclusion was not possible" [McAdoo 1931: 372]. If the tax generated less money than was required, rates would have to be raised again and perhaps repeatedly. If the original tax was excessive, it would be unnecessarily dispiriting and economically deflationary. Since changing tax schedules always requires a controversial, complex, and drawn-out political debate, uncertainty about the military requirements was a major concern.[9] Moreover, as the estimated cost of the war effort mounted to "appalling" levels, McAdoo came to the conclusion that, despite the high tax rates, tax revenues would not cover anything like one-half the cost. Given the commitment to the progressive structure of rates, taxation had reached its acceptable limit. "If you take the whole of a man's surplus income through taxes," McAdoo explained, "you cannot expect him to buy bonds, nor can you expect industry to expand and prosper" [p. 384]. The revised goal was one-third from taxes and two-thirds from borrowing.

Financing a war by borrowing need not be inflationary if the public diverts income away from consumption and other expenditures in order to buy bonds. Higher saving out of income would necessarily mean lower consumption. Such a change in saving behavior, however, would be difficult to engineer and far from certain. A high rate of return on the war bonds would be unlikely to work. Higher rates might tempt some to take momentary advantage, save extra vigorously when rates were high, and then less so when rates fell back to normal. Higher rates

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[9] For discussions of tax policy and the deliberations in Congress see Ron Blakey [1917], Edwin Seligman [1918], and Robert Haig [1919].

might even stimulate some to set a higher target for retirement wealth. But there is also an opposite effect. With high interest rates, wealth would accumulate more rapidly. With that mechanism working on behalf of the saver, *less saving* from current income would be required to ultimately reach a target level of wealth. The two opposite tendencies would cancel each other. Empirical evidence from postwar data indicates that the balance between saving and consumption is insensitive to interest rates. It seems that people decide on a division of their income between consumption and saving and stick to it regardless of the rate of interest.[10] Another problem with offering a high interest rate on bonds is that it might divert funding from investments in physical capital when the war effort demanded an increase in productive capacity.

It is unclear if McAdoo understood that high rates would not work. In any case, he was opposed to high rates of return because that would reward the rich – the very group the income tax was designed to target. He chose to keep the rates competitive with the current return on comparable assets. The trick was to convince people to save more in order to buy the securities:

> The only possible way to restrain inflation, to some extent at least, was by the imposition of heavy taxation and by preaching constantly to the people the necessity of saving their money and investing it in government bonds and of refraining from extravagance and waste in every form [McAdoo 1931: 384].

McAdoo astounded everyone with his request for an authorization to borrow $7 billion on the credit of the United States (as a fraction of the gross domestic product that would be roughly $1,900 billion today). Actually, he had no intention of attempting a sale of that magnitude all at once. But he wanted the flexibility of a very high debt ceiling. The ceiling allowed Congress to avoid setting limits on specific bond issues given the uncertain cost of the war. Moreover, McAdoo argued, the "largest authorization of bond issues ever contained in any bill presented to any legislative body in the history of the world" would prepare "the public mind as soon as possible for a huge expenditure" [McAdoo 1931: 375, paraphrasing the chairman of the Ways and Means Committee]. McAdoo knew that Congress would more easily accept massive borrowing than confiscatory taxation. Congress was persuaded. The $7-billion ceiling

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[10] There is a large technical literature on this point. For a sampling see Paul David and John Scadding [1974], Franco Modigliani [1975: 15-16, and 1986: 269], Robert Hall [1988], John Campbell and Gregory Mankiw [1989], and Alberto Giovannini [1985].

rather than an unrestricted authorization was seen by some as insurance that the cost of the war would be contained. Of course, it was a meaningless promise. The limit would have to be raised if expenditures outran revenues since the government, like other entities, must pay its bills. This expedient of war, however, has been continued ever since as the Congressional "debt ceiling," an unfortunate idea that would come to haunt fiscal policy in the twenty-first century [Austin and Levit 2013: 16-18].

The first offering of bonds was to be for $2 billion promising a 3.5 percent rate of return. That was slightly below the rate paid by savings banks on customer's deposits (which ranged between 3.5 and 4 percent) or the yield on high-grade municipal bonds (3.9-4.2 percent) [Carter et al. 2006: Cj1193 and Cj1250; Kang and Rockoff 2006: Figure 1]. If the rates had been higher, much of the money used to purchase the government bonds might have simply been drained from individuals' preexisting accounts. Such a rearrangement of portfolios would not have increased saving or reduced consumption. McAdoo also knew that the financial institutions would resist mightily any competition for their deposits from the government.

The bonds had coupons, were due in 30 years, and were callable after 15. Both the interest and principal were to be paid in gold (that provision would turn out to be a problem after gold holdings were made illegal in 1933). To make them more attractive to the rich, the interest would be tax exempt (like the return on municipals). To many observers a massive bond sale on these terms seemed to be an imprudent gamble. The worry expressed by bankers and bond dealers at the time was unanimous: the bonds might not sell without the promise of an extra-attractive return. Moreover, the critics pointed out, only a few Americans had any direct knowledge about bonds, fewer still actually owned any. Would the public be willing to enter these waters?

It was at this point that McAdoo conceived of the Liberty Loan plan. It had three elements. (1) The public would be educated about bonds, the causes and objectives of the war, and should be led to appreciate the financial power of the country. McAdoo chose to call the securities "Liberty Bonds" as part of this educational effort. That name "would carry more fire and meaning than 'government 3½ per cents'." (2) The government would appeal to patriotism and ask everyone – "businessmen, workmen, farmers, bankers, millionaires, school-teachers, laborers," housewives, and even school children – to do their part by reducing consumption and purchasing bonds. (3) The entire effort would rely upon volunteer labor. The money market would be avoided. No brokers' commissions would be paid. No sales force would be hired. The men and women who could not go into military service would constitute a "financial front … the economic equivalent of the military front" [McAdoo 1931: 378-379, 382-383, 385].[11]

To the war planners the appeal of borrowing funds from the public was that it would be good for morale. Individuals could demonstrate their support for the war by purchasing bonds. Indeed, during the bond campaigns purchasers were given buttons to wear and window stickers to display thus advertising their patriotism. "Fight or Buy Bonds," the poster urged; see Figure1. If bond sales were strong, if the offering was oversubscribed, that would demonstrate American resolve. Yet there was a risk. Poor sales would be a sign of weak support and insufficient patriotism. To avoid a failure to sell the entire bond issue, the government arranged to sell them in a series of brief campaigns by subscription. If some of the bids that had to be accepted were below par, that unhappy fact might be neglected in the hoopla that accompanied the effort. The first campaign was announced on April 28, 1917, 22 days after the declaration of war; the Federal Reserve Banks opened the subscription books on May 14 and closed them on June 15. The advertising campaign was concentrated in this brief window and was intense [Mock and Larson 1939].

Fears of inadequate demand were proved unwarranted. The first loan was oversubscribed by fifty percent with four million subscribers accepted everyone at par. Nationally, that would represent about one household in every six. Subscribers for the smallest amounts were given priority, large subscribers were rationed. John D. Rockefeller, who pledged $15 million, was allotted only "something over $3 million." The participation of the small buyers was hailed as an answer to German newspapers that asserted it was a bankers' loan [*New York Times* 23 June 1917].

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[11] Other treatments of the Liberty Loans can be found in Charles Gilbert [1970], David Kennedy [1980: Chapter 2], and Sung Kang and Hugh Rockoff [2006].

In all there were four Liberty Loan drives initiated during the war and a fifth "Victory Loan" issued after the armistice. The second Liberty Loan, for $3 billion, was open for six weeks and concluded on November 15, 1917. It was during that effort that the Italian biplane bombed Fifth Avenue. The third and fourth drives were each about a month long in April ($3 billion) and October of 1918 ($6 billion) [Kang and Rockoff 2006: 34-36]. Because interest rates on alternative assets had risen, the rates on the subsequent loans were increased to keep them competitive. They were 4 percent on the second loan and 4¼ percent on the third and fourth. Because of the heavy oversubscription of the first loan, the tax exempt provision was removed from the subsequent loans [McAdoo 1931: 408]. All five campaigns were oversubscribed.

The loan drives were the subject of the greatest advertising effort ever conducted by the American government. For the first drive in May 1917 there were to be 11,000 billboards and streetcar ads in 3,200 cities, all donated [U.S. Committee on Public Information, 21 May 1917]. During the second drive sixty-thousand women were recruited to sell bonds [McAdoo 1931: 407]. According to an article in the *New York Times* there were more than 9-million posters, 5-million window stickers, and 16-million lapel buttons issued for the Third Liberty Bond drive [*New York Times* 10 March 1918]. McAdoo consciously made himself the public face of the bond sales and posed as the leader of a great national crusade. He went on extended speaking tours and reported warm receptions at every stop. In Limon, Colorado (population approximately 800), the citizens who greeted his arrival wore badges that read: "How'de do! McAdoo!" [Craig 2013: 171].

This elaborate effort was conducted with unprecedented ingenuity by a home-grown propaganda ministry called innocuously "The Committee on Public Information." The propaganda campaign – McAdoo saw it as an educational campaign – was essential, not simply to explain bonds, but to sell the war. This all occurred before the scientific opinion poll, but we can be fairly certain public sentiment before 1917 was not only against American involvement but not even agreed on which European military to root for. A poll of newspaper editors in 1914 by the *Literary Digest* found 242 declaring their personal neutrality, 120 who supported the British-French alliance, and 20 who supported the Germans. When queried regarding the views of their readership, the editors reported 189 cities supported the Allies, 38 the Germans, and 140 were neutral or divided. Even those who declared allegiance to one side or the other frequently opposed American military involvement. Running for reelection in 1916, Wilson adopted the campaign slogan "He kept us out of war" and pushed his argument for non-involvement relentlessly. In a post-election recap, "Why Wilson Won," the *Literary Digest* canvased newspaper editors in previously-red states that had unexpectedly voted for the President. Editors from California, Washington, Kansas, Minnesota, Ohio, and New Hampshire all mentioned the popularity of the anti-war sentiment as an important factor in tipping the election. "The potency of the peace argument among women voters is acknowledged by editors and press correspondents, and it was set down by several observers as decisive in Kansas, Utah, and Washington." Only twelve states allowed women to vote, Wilson won ten.[12]

Wilson's Republican opponent, Charles Evans Hughes, was also for peace. So, not surprisingly, a major campaign was needed to persuade the public of the necessity and the legitimacy of military action against the Germans. Persuasion would be difficult because American involvement was predicated, not on a desire for territory or revenge, but on an intangible ideal: "a war to end war" in H. G. Wells' catchphrase. When asking for war on April 2, 1917 Wilson framed the war's objective: "The world must be made safe for democracy."[13] For the task of molding and solidifying public opinion Wilson turned to George Creel, a journalist – one of the muckrakers – twelve days later. Creel created the Committee on Public Information and staffed it with fellow journalists, artists, psychologists, and advertising designers. The Committee seemingly invented and certainly perfected all of the techniques now associated with modern advertising. The magazine illustrator Howard Chandler Christy drew

[12] The *Literary Digest* poll was reported in the issue dated November 14, 1914 [p. 939]. The election wrap up appeared on November 18, 1916. The election was close and the result was not confirmed until the Friday after Tuesday's voting when California's 13 electoral votes went to Wilson carried by only 3,806 popular votes. And, that was not certain until ballot boxes from several rural precincts of Sierra County were hauled over roads made all but impassable by snowdrifts. The results of the voting are described in Scott Berg's biography of Wilson [2013: 397-417]. And, yes, the Republican color was red even then [Berg 2013: 414].

[13] Wilson called the Congress into extraordinary session and asked a joint meeting of both houses to declare war on April 2, 1917. They did so on April 6. There was still strong doubts in many quarters about the wisdom of joining the war, see the remarks of Senator Robert LaFollette (D, Wisconsin): "This war is being forced upon our people without their knowing why and without their approval" [*Congressional Record*, Senate, April 4, 1917, 224–225]. Earlier, on January 22, 1917, Wilson had hoped for "peace without victory." It would be difficult indeed to sell this.

Liberty as an attractive young woman dressed in a see-through gown cheering on the troops; see Figure 1. While working for Creel the man now regarded as the “Father of Public Relations,” Edward Bernays, pioneered the techniques of manipulating and managing public opinion based on the theories of mass psychology. The Committee appealed to innate motives: the competitive (which city would by the most bonds), the familial (“My daddy bought a bond. Did yours?”), the impulse to follow a leader, guilt (“If you can’t enlist, invest”), fear (“Keep German bombs out of your home”), revenge (“Swat the Brutes with Liberty Bonds”), social image (“Where is your Liberty Bond button?”), gregariousness (“Now! All together”), herd instincts, maternal instincts, and – yes – sex. Bernays’ uncle was Sigmund Freud.[14]

In these years before radio – the first commercial transmission was in 1920 on the first Tuesday in November when Pittsburgh’s KDKA broadcast election returns – the Committee organized an enormous legion of 75,000 volunteer public speakers to deliver four-minute speeches promoting bond sales. The goal was to appear during the intermission at every screening at every cinema in the country. These “Four-Minute Men” were provided detailed advice on public speaking and were offered suggestions regarding the content and tone of their exhortations in a *Bulletin* issued every few weeks.[15] Every Four Minute Man was urged to make up his own speech [*Four Minute Men Bulletin* 29 July 1918: p. 22], but the advice was often specific:

> Avoid discussion of economic theories, directly or by implication. These theories and all other theories have no relation to the topic of these speeches. … Director General Roger W. Babson, of the Division of Information and Education of the Department of Labor, suggests, as introduction for a speech, something like the following: "I know nothing of ‘Labor and Capital.' I know only honest Americans who all want to help in this great fight of the people against Kaiserism." [*Four Minute Men Bulletin* 29 July 1918: 3].

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[14] Histories of the U.S. Committee on Public Information have been written by James Mock and Cedric Larson [1939] and Alan Axelrod [2009]. Walter Lippmann also surveyed the propaganda work of the Committee in his influential book *Public Opinion* [1922]. After the war Edward Bernays wrote the classic handbook, *Propaganda* [1928].

[15] A history of the Four Minute Men may be found in James Mock and Cedric Larson [1939: Chapter 5]. Also see the journal article by Alfred Cornbise [1984] and the book by Alan Axelrod [2009: Chapter 5]. The idea of restricting these exhortations to four minutes was a stroke of advertising genius. Even today commercials, popular songs, and most important messages rarely exceed four minutes in length.

Celebrities were recruited. Charlie Chaplin, Mary Pickford, and Douglas Fairbanks, certainly among the most famous personalities in America, toured the country holding bond rallies attended by thousands. In those days, if you wanted to see film stars off screen, you had to show up in person.

> Great enthusiasm marked the Liberty Loan meeting in front of the Sub-Treasury [now Federal Hall on Wall Street in New York City] yesterday, at which Douglas Fairbanks and Charlie Chaplin took part. As far as the eye could reach from the top of the steps of the Sub-Treasury the streets were a mass of upturned faces, and apparently all who could get the necessary room to free an arm raised it aloft when they were asked to pledge themselves to buy Liberty Bonds. [*New York Times* 9 April 1918].

{Figure 4}

Ruth Law, the aviator, was also famous, a national hero, and a new role model for young girls, although she is largely forgotten today. In 1916 she thrilled the nation with her flight from Chicago to New York State breaking the American record for a non-stop air flight (590 miles). It was a remarkable feat for anyone, but completed by a young woman (!) in an obsolete Curtiss biplane with an open, unshielded cockpit it was "marvelous," "heroic," and "most wonderful." Before the flight, mechanics and other experts said the plane – with only a single 100-horsepower motor to power a single propeller mounted in the rear – simply was not capable of such a flight. Her own mechanic actually wept as she took off, certain that she would die in the attempt. The airworthiness of the biplane notwithstanding, many predicted Law would not have the endurance to withstand the intense cold and biting wind of the upper air at 5,000 feet. Butshe did.[16]

{Figure 5}

Five months later, the United States entered the war. Law volunteered to fly combat missions for the Army but was denied because of her gender. No surprise there, but she was

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[16]To condition her body against the elements before the flight, she slept in a tent on the roof of the Morrison Hotel in Chicago. Newspapers consistently described Law as an "aviatrix," or – worse – the "little bird woman." After she landed on Governors Island in Upper New York Bay, she faced about fifty newspaper men. "'You have made the longest flight a woman ever made, haven't you?' they asked. 'I have made the longest flight an American ever made,' she replied, leaving no doubt that she wished to be known as an aviator rather than an aviatrice." The primary source of information for Law's 1916 cross-country flight is the *New York Times,* November 20 and 21, 1916. The best historical account is by Eileen F. Lebow [2002, Chapter 11]. There is a delightful children's picture book based on the *Times* articles written by Don Brown [1993].

outraged [Law 1917: 12]. She couldn't fly for the Army and because the government shut down civilian aviation to conserve fuel, she couldn't fly without government support. So she volunteered to fly for Liberty Bonds. McAdoo agreed. The gasoline was donated. For ten days in June of 1917 she barnstormed the Midwest dropping cardboard bombs advocating the purchase of Liberty Bonds. Elaborate preparations were made for guiding her flight.

> At Omaha a standing balloon will be suspended over Fort Crook, to allow the aviatrix to get her bearings … Her way from Omaha to St. Joseph will be marked by a huge white arrow a hundred feet long and ten feet wide, being built under the stationary balloon … On the arrow, in black letters will be "To St. Joseph." At St. Joseph a huge white cross forty feet square … will indicate where to land [*Lincoln Daily Star* 7 June 1917].

It was a sensation. Her over flights made front page news throughout the region. "Immense crowds" greeted her landings [*Moberly Daily* 9 June 9 1917]. Three-thousand cheering spectators witnessed her take off from Lincoln and head to St. Joseph, Missouri [*Lincoln Daily Star* 8 June 1917: 1 + 4, also *Muskogee Times-Democrat* 9 June 1917: 1].

Her trip was not without risks. In route from St. Louis to Chicago the gasoline tank exploded enveloping her airplane in flames at 2,000 feet.

> Her life was saved only by consummate coolness and quickness of wit. Without a moment's hesitation she pointed the nose of her machine straight down and descended with such velocity that the wind blew out the fire. She was uninjured, save for burns about the face [*Cincinnati Enquirer* 15 June 1917: 2].

In April of the next year during the third campaign there was a Liberty Day Parade up Washington's Pennsylvania Avenue. President Wilson stood throughout, "hat over his heart" viewing 40,000 government clerks and other Washingtonians file past the White House for more than three and one-half hours. "Ruth Law, in a light airplane, and military aviators in their heavy machines hummed overhead, looping and diving" while canvassers gathered "a multitude of pledges" [*Gettysburg Times* 27 April 1918].[17] All this to sell McAdoo's bonds. By war's end,

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[17] Law's flights for Liberty Bonds were extensively reported throughout the country. For a sampling see the *Lincoln* [Nebraska] *Daily Star* [June 7 and 8, 1917], The *Seattle* [Washington] *Star* [June 8, 1917], the *Hartford* [Kentucky] *Republican* [June 8, 1917], the *Muskogee* [Oklahoma] *Times-Democrat* [June 9, 1917], the *Cincinnati Enquirer* [June 15, 1917], and the *Gettysburg* [Pennsylvania] *Times* [April 27, 1918].

after four drives, twenty million individuals had bought bonds and $17 billion dollars had been raised – not the $7 billion as first authorized. Taxes collected amounted to $8.8 billion. Almost exactly two-thirds of the war funds came from bonds and one-third from taxes [McAdoo 1931: 412, Kang and Rockoff 2006: 36].[18] This was a time when seventeen billion dollars was an almost unthinkable number. An equal share of gross domestic product today would amount to $3.6 trillion.

Did the plan succeed? In one sense the answer is obvious. The money was raised as planned (one-third taxes, two-thirds borrowing). The campaigns elicited broad-based patriotic support for the war. The financial front stood with the military front to share in and celebrate the victory. McAdoo was regarded as a hero. An editorial in the *Washington Post* gushed:[19]

> He is performing a work of heroic proportions, more effective against Germany than any single army. The blows he administers are not spectacular, but they reach a vital spot and are of terrific violence. They are backed by the mighty power of the American people and a continent of resources. The nation is exerting its money power effectively because Mr. McAdoo thinks and acts on a national scale [*Washington Post* 1 May 1917: 6].

But there is another sense in which the plan did not achieve all that was hoped for. As McAdoo feared, inflation was not avoided. Price inflation actually began in 1915 shortly after the outbreak of war in Europe. The gold standard was primarily to blame. Once gold began flowing back into the United States around December of 1914, the circulation of gold-backed currency soared. Wholesale prices rose 65 percent during the period of American neutrality. Shortly after war was declared by Congress the legal reserve requirements for Federal Reserve

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[18] Milton Friedman and Anna Schwartz estimated the breakdown as 25 percent from taxes, 70 percent from borrowing, and 5 percent from "direct money creation" [1963: 121]. Direct money creation, as Friedman and Schwartz define it, is the increase in the sum of bank reserves on deposit at the Federal Reserve plus currency in the hands of the public, sometimes called "high-powered money." According to Hugh Rockoff, "the effect was much as if the government had simply printed money and used it to pay soldiers, much as it had done with the "greenbacks" in the early phase of the Civil War" [Rockoff 2004: 8].

[19] The Committee for Public Information was not above planting favorable editorials spotlighting the "Commander-in-Chief of the Liberty Loan" [Craig 2013: 170]. Perhaps they had a hand in the editorial published in the Washington Post.

Banks was lowered and the Fed adopted an easy money policy to accommodate the government's commitments [Gilbert 1970: chapter 13]. But the rate of inflation actually slowed, thanks in part to the deflationary effect of high taxes and the abnormally high saving produced by the purchase of bonds [Friedman and Schwartz 1963: note 33, p. 218].[20]

While the pace of inflation slowed, it did not stop. Wholesale prices continued to rise at approximately five percent per year between July 1917, when the first loan was taken up, and November 1918, the date of Armistice. Still, this was much lower than the 20-percent rate of annual increase recorded between July 1914 and July 1917 [NBER data series 04193, "WPI other than farm products & food"]. A large part of the reason that inflation was not completely halted was that banks lent money to enable bond purchases. McAdoo, anxious to keep the small borrower in the market for the subsequent issues of bonds, implemented a "borrow-to-buy plan." Commercial banks pledged to make loans that borrowers would use to purchase bonds. They would charge the same rate of interest that the bonds themselves carried. The loans would be secure since the bonds served as their collateral. As the loans were made, the Federal Reserve accommodated the scheme by issuing Federal Reserve Notes. While the Fed did not print money to pay for the war, they did print notes which the banks lent to those who used the funds to purchase bonds, and the proceeds from the bond sales helped pay for the war. It comes to much the same thing. Perhaps as much as 7 percent of the bonds were financed in this way.

{Figure 6}

After the fact the Treasury and the Fed would assert that they had limited the expansion of credit during the war "as far as practicable." Benjamin Strong, the Governor of the New York Fed, asserted that the expansion of credit during the war was "inevitable, inescapable, and necessary, and was in my opinion, defensible" [1921: 452]. A Treasury official asserted,

[20] On the inflation during the war see Russell Leffingwell [1920: 34], Barry Eichengreen [1992: 70-73], and Milton Friedman and Anna Schwartz [1963: 206-218]. During the American engagement the government attempted to control prices by managing the supply of and demand for a few key commodities rather than by direct price control. The U.S. Food Administration under the directorship of Herbert Hoover manipulated the prices of wheat relying upon cooperation rather than coercion [Hall 1973: 45]. The War Industries Board under the leadership of financier Bernard M. Baruch focused on the price of steel [Kester 1940]. Hugh Rockoff suggests the impact of these agencies on inflation was small [2004: 15-17] apparently reversing his earlier conclusion that they arrested "the inflationary spiral" [1984: 83]. The agencies' impact was small perhaps because "production, not inflation" was the first concern of Hoover and Baruch [Kennedy 1980: 119].

"government expenditures and commitments always outran the provision made for them by the Treasury, whether in cash or credit." The Treasury explained:

> Government contracts covered future production for months or years ahead, but the Treasury never during the whole period of the war had provided money or bank credit sufficient to meet its requirements for more than a few weeks ahead. Prices rose in response to the effective demand of the United States Government sustained by the general credit which its resources and taxing power and the devotion of one hundred million people gave it [Leffingwell 1920: 34].

The devotion of the people was clearly manifest. Most of McAdoo's bonds were purchased by the public, 62 percent of the value sold by one estimate [Goldsmith 1955: I, Table V-2, pp. 474-475]. The Treasury calculated that 20-million people or more subscribed for some or all of the loans [Leffingwell 1920: 23]. That is pretty impressive given that there were only 24-million households at the time. A government survey of almost 13,000 urban wage-earners conducted in 1918 and 1919 indicated that 68 percent owned liberty bonds.[21] More than half of the bonds sold were $50 bonds, the lowest denomination [Gilbert 1970: 131 and 135]. It seems undeniable that the emotional advertising campaign effectively produced a broad and strong desire to do one's part for the war effort by participating in this way. After the war, McAdoo's assistant in fiscal matters, Assistant Secretary Russell Leffingwell, described the loan campaigns "as the most magnificent economic achievement of any people. … the actual achievement of 100,000,000 united people inspired by the finest and purest patriotism" [Leffingwell 1920: 24; McAdoo 1931: 403].

{Figure 9}

Fighting ended on Armistice Day, November 11, 1918. The fifth and final bond drive – dubbed the Victory Liberty Loan and advertised as necessary to "finish the job" and to "bring the boys home" – was launched the following year. It concluded in May of 1919. Creel's Committee on Public Information was terminated in August. We might then suppose that the

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[21] Only married wage workers and salaried workers earning less than $2,000 per year were surveyed. The family had to include a husband, his wife, and at least one child. Non-English speakers and "slum" families were excluded [Olney 1993]. The survey was conducted by the U.S. Bureau of Labor Statistics. The original survey forms for each interviewee were retained by the National Archives. The data on Liberty Bond ownership was collected from these manuscripts by Martha Olney.

pure patriotic motive to continue holding Liberty Bonds would weaken and the stigma on those who sold would be removed. Some individuals and corporations would divest themselves either to diversify their portfolios or to finance an increase in consumption. If that occurred in any great volume, the rush of sell orders should have depressed bond prices. That would push up the yields earned by the bond's new owners. But that didn't happen. Two economists at Rutgers University, Sung Won Kang and Hugh Rockoff, examined the prices of Liberty Bonds on the open market and reported that Armistice appears to have had little effect. "The yields were remarkably stable for the following year." Surprisingly, they suggest this stability indicates that the patriotic motive during the war-time drives had been weak. "There seems to be little evidence that a large reservoir of patriotism was being unwound" [2006: abstract and p. 18].

There is a danger, however, of misunderstanding their findings. The stability of Liberty Bond prices in 1919 by itself leads to no conclusion about the support for the war by members of the public. Indeed, throughout the bond drives the "nation showed its heart was in the war for liberty," as one Pennsylvania newspaper expressed it [*Gettysburg Times* 27 April 1918]. How then to explain the failure of bond prices to fall once the war was over?

First, the Allied victory was in doubt until a few months prior to the Armistice. Purchasing and holding Liberty Bonds during the war carried the risk that a German victory could lead to default. The bonds required a risk premium that reduced their value. Once victory was assured however, the bonds returned to the "risk-free" status of sovereign bonds during peace time. This reduction in risk should have increased their value as an asset and possibly offset any tendency for prices to soften.

Second, it is doubtful that members of the public, the putative patriots, would actually have had much of a desire to sell bonds. Most of the Liberty Bonds were purchased by individuals who were relatively inexperienced with financial markets. Despite their new-found understanding, thanks to McAdoo's educational campaign, what they had come to know was a streamlined bond market established by the Federal Reserve Banks, staffed by a volunteer sales force, and promoted and explained by a relentless advertising campaign. They probably remained in the dark about the value of portfolio diversification, the connection between risk and return, and the mechanics of the brokerage industry. Sophistication about such matters would blossom after 1922, but it is not obvious that the bulk of the public would consider diversifying to higher-yielding, but risky, financial assets before the mid-1920s. Moreover, those wage earners who withdrew money from their savings deposits (their accumulated past saving) to loan to the government during the war would not see an advantage of selling bonds simply to restore their bank balances. Once the war was won Liberty Bonds were safer than, and just as remunerative as, savings deposits at the local bank. The public's desire to sell bonds to purchase automobiles or durable goods would probably have to wait until the production lines for such items revived. For cars that didn't happen until the late summer of 1919 [NBER 1107a, U.S. Department of Commerce 1927], for other durables it began only after the depression of 1920-1921 was past [Olney 1991: Tables A.6 and A.7]. There is a further point emphasized by Hartley Withers, the editor of *The Economist*, "the war has taught a great many people who never saved at all to save a good deal" [Withers 1919: 9]. The Liberty Loan campaigns probably made life-cycle savers out of some who were not savers before. If so, they would have no reason to dissave.

Third, and this is Kang and Rockoff's significant point, institutional holders of government bonds such as banks, corporations, and insurance companies kept their profit motives intact during the war. They were less likely to have been motivated by patriotism and swayed by the emotional propaganda than the general public, so the ending of the Liberty Bond promotions and the easing of social pressure to hold bonds, would not have had much impact on them. Indeed, non-financial corporations, insurance companies, pension funds, and the Postal Savings System collectively *increased* their holdings of U.S. government bonds in both 1919 and 1920 [Goldsmith 1955, volume I, table V-48, pp. 533-536]. In that sense, if Kang and Rockoff's conclusion that patriotic motives were weak is limited to the financially sophisticated and profit oriented, they are right to emphasize the primacy of financial incentives over social solidarity [2006: 33]. But Liberty Bonds were meant to unite the nation, appeal to the public, engage the home front, and win the war. That they did.

The stability of the yields on Liberty Bonds in the year following the fifth bond campaign did not last into 1921. Yields rose as bond prices fell below par. However this change was the consequence, not of a flight from bonds, but rather, of a deliberate monetary policy change by the Federal Reserve. The Great War had ended with victory in November of 1918. McAdoo left the Treasury and the Fed's Board of Governors in December of 1918 to be succeeded by Carter Glass. The economy momentarily experienced a post-war boom propelled by an unusually favorable investment outlook. Credit was cheap. There was high pent-up demand by corporations for capital goods. Consumption returned to more normal levels. There was also an abnormally strong demand for American exports from war-devastated Europe. But the boom would be short lived. The Roaring Twenties began rather inauspiciously with a sharp deflationary recession known to economists as the Depression of 1920-1921" [O'Brien 1997].

Policy makers in Washington were worried. The federal debt had exploded because of wartime expenditures; the pace of inflation picked up following the Armistice and remained high in 1919 and 1920. Industrial goods prices rose 25 percent over that year. The orthodoxy of the time suggested that the federal budget should be brought into surplus, the debt reduced, and prices returned to "normal" levels. Following that prescription, authorities implemented what today would strike most economists as incredibly harsh policies. From the fiscal year beginning in July 1918 to the following one, federal spending was slashed from $18.4 billion to $6.4 billion and then reduced again another 22 percent to $5 billion the following fiscal year. The Federal Reserve responded to the continuing inflation by raising its discount rate from a low of 4 percent in 1919 to 7 percent by June 1920 (a level not reached again until 1973).[22] The consequent deflation was the most precipitous in history. Wholesale prices fell 37 percent between 1920 and 1921. The collapse of prices and the decline in government demand triggered a depression. The index of industrial production fell 48 percent by one measure and fell by one third by another. The civilian private non-farm unemployment rate soared from 1.9 percent at war's end to 16.3 percent in 1921.[23]

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[22] Benjamin Strong, the President of the New York Federal Reserve Bank, clearly states that the discount rate was increased as a deliberate anti-inflation move [1921: 501-504]. Milton Friedman and Anna Schwartz' conjecture that declining reserve ratios was the motive for the rate increase seems, to me, an inadequate explanation [1963: 229-231]. See Daniel Kuehn for a helpful analysis [2010: 7-10].

[23] The Depression of 1920-1921 has been described by Robert A. Gordon [1974: 17-23], Christina Romer [1988], Anthony O'Brien [1997], Paul Krugman [2011], and Daniel Kuehn [2010]. The data cited are reproduced in Susan Carter et al [2006: Series Ea650 for the Federal debt, Cc2 for consumer prices, Cc66-67 for wholesale prices, Ea644 for federal expenditures, Cj113-114 for the Federal Reserve discount rate, Cb28 and Cb31 for industrial production, and Ba476 for the civilian private non-farm unemployment rate]. The civilian unemployment rate (including agriculture and government employees) rose to 11.3 percent [Series Ba 475].

The Berkeley economist and inveterate blogger Brad Delong has described the mechanism with characteristic clarity [2011]. The 1920-1921 depression was triggered by a Fed decision to fight inflation by forcing interest rates up. The resulting financial squeeze rendered new construction, other forms of investment, and some durable consumption goods – items that were typically purchased with borrowed funds – unaffordable. Purchases declined. The excess supply of goods caused prices to decline. Falling prices only made the economic conditions worse as they encouraged the postponement of spending on big ticket items as customers waited for yet lower prices. Unemployment spread as businesses cut back production in the face of dwindling demand. The unemployed tightened their belts. The excess supply of labor caused wages to fall. The employed had less to spend.

But, "as soon as the Fed had achieved its inflation-fighting goal" it ended the squeeze. The Fed promptly lowered the discount rate back to 4 percent and the economy snapped back to reasonably-full employment. The recovery was rapid because the speed of any recovery is linked to what caused the downturn. "And all the lines of business that had been profitable before the downturn [became] profitable once again. From an entrepreneurial standpoint, therefore, recovery was a straightforward matter: simply pick up where you left off and do what you used to do" [DeLong 2011]. By 1922 the favorable long-term investment outlook again made itself felt and the twenties began to roar ahead. After the "return to normalcy," yields on the bonds returned to about the level at issue and prices returned to close to par [Kang and Rockoff 2006: 18].

McAdoo had taken a gamble when he depended on faith that Americans could be induced to save more heavily than they would otherwise. He won that gamble. Saving rates shot up during the war and then returned close to their pre-war normal following the end of hostilities.[24] Consumption fell during the war. Stanley Lebergott's extensive study of consumption

[24] Paul David and John Scadding report that the variation in saving rates for the first three decades of the twentieth century was "extremely small" except for the World War I years when they soared [1974: 225]. Martha Olney [1991: Figure 2.2, p. 54] and Richard Sutch [2006: Figure Ce-F, p. 294] have confirmed this finding.

expenditures found that spending in real terms was running nine percent below trend by 1919 [1996: Table A2, Carter et al. 2006: Series Cd78].[25]

{Figure 8}

The "extra" saving generated by the Liberty Loan left many American households with a level of assets that they would not otherwise have accumulated. As a by-product of war they found themselves ahead of their life-time accumulation plan. That meant in the 1920s that households could, if they chose, save less than they would otherwise. But it also meant for many that they might "save differently." Saving rates defined to include consumer durables actually were higher after 1922 then before [Olney 1991: 54]. The "consumer durable revolution" which characterized the "Prosperity Decade" of the 1920s was financed in part by the retirement of the Liberty Bonds and the rise of installment credit.[26] The accumulated savings also helped to enable and encourage retirement of the elderly. Together with Social Security this was a factor in the general decline in the labor force participation of men over 60 during the last half of the twentieth century.

By McAdoo's own assessment, the Liberty Loan campaigns were a great success. With the help of the Committee on Public Information, the educational mission he designed informed the public and sold bonds, but it also generated a great outpouring of patriotic energy from ordinary Americans – factory workers, laborers, farmers, journalists, school-teachers, mothers, schoolchildren.[27] That energy not only generated the billions of dollars needed and delivered

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[25] The Treasury's exhortations to save were reinforced by Herbert Hoover's campaign urging people to eat less wheat and less meat. Mondays and Wednesdays were to be wheatless; Tuesdays meatless. On Saturdays all meals were to be porkless, one meal wheatless, and one meal meatless. Voluntary plans were issued for each day of the week. The *New York Times* reported that thirteen million households had signed a pledge to follow the guidelines. Bakeries, hotels, and restaurants were ordered to make and serve only "Victory Bread" containing at least 20 percent of grains other than wheat [*New York Times* January 27, 1918: 1+2]. Hoover's Food Administration had a parallel in the Fuel Administration which proclaimed gasless Sundays, heatless Mondays, and lightless nights. These efforts probably did little to directly affect total saving. They were intended to conserve food and fuel for the war effort, but they also contributed to the active engagement of the home front. See Figure 7.

[26] On the consumer durable revolution and installment purchasing see Martha Olney's *Buy Now, Pay Later* [1991]. *The Prosperity Decade* is the title of George Soule's influential 1947 treatment of the 1920s.

[27] Some of that enthusiasm stretched over the line when individuals who refused to purchase bonds were intimidated and publically humiliated. The town of Baxter Springs, Kansas, installed a yellow bulletin board at the corner of Eleventh Street and Military Avenue for the public posting of the names of "slackers" and "yellow dogs." "Anyone

them on schedule (see the frontispiece), but also supplied all the volunteer labor and supplies employed to carry out the campaign. The program was designed to lower aggregate consumption, increase the savings rate, and moderate inflation. Historical statistics suggest that it did (see the addendum). During the war McAdoo's model was imitated by the British and particularly the Canadians. Many of the lessons learned were applied during the Second World War which also relied heavily on borrowing. The economic history of this episode suggests that McAdoo's pride in his war finance plan was justified.

McAdoo's accomplishments as Secretary of the Treasury are not limited to the success of the Liberty Bond campaign. His work to create a decentralized federal bank was critical in preventing the capture of the Federal Reserve by the New York bankers. For this he should be regarded as a progressive hero.[28] His actions to close the stock market and keep the currency convertible to gold in 1914 led to the supremacy of the dollar in world financial markets. That role for the U.S. dollar has persisted to this day. The sharply progressive tax structure of 1917 and 1918 which was only partially lowered in the 1920s, created a federal fiscal capacity that has also persisted. That taxing power was used to finance an infrastructure of highways, air traffic control, electrical power generation and transmission, scientific research and development, the internet, and higher education; all of which propelled and helped sustain economic growth. The tax receipts also allowed for budget surpluses in the 1920s and the retirement of the Liberty Bonds. We can also report that progressive income and estate taxation were responsible for

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who shows disrespect to a Liberty Bond or Thrift Stamp salesman is a Yellow Dog" [*Baxter Springs News* 18 October 1918: 1]. The *Watauga Democrat* published in Boone, North Carolina, reported that "Throughout North Carolina and the nation sentiment toward the slacker is crystalizing and the fine finger of scorn and contempt is searching him out." The slacker is one who can but does not buy Liberty Bonds. "The slacker is a marked man. … His children and his children's children after him will pay a bitter price for his disloyalty" [6 June 1918: 1]. Given such rhetoric it is not surprising that some slackers were attacked physically by vigilantes. The *Liberal Democrat* of Liberal, Kansas, advocated "yellow paint and chicken feathers" [2 May 1918]. An unfortunate Henry Lange of Carlsbad, New Mexico was kidnaped and "administered a liberal coat of tar and feathers" [*Evening Current* 29 April 1918: 2].

[28] Although the Fed was intended to prevent banking crises like the one in 1907, it proved inadequate to task when the banking system collapsed during the 1930s. However, I am not aware of any evidence that a central bank controlled by bankers as New York wished would have been able to prevent the depression of the 1930s or the bank failures that accompanied the downturn. It is also worth noting that during McAdoo's tenure at the Treasury and Fed he was able to prevent the liquidity crisis of 1914 from inducing a bank panic when the New York bankers seemed powerless to help [Jacobson and Tallman 2013].

much of the decline in income inequality during the interwar period [Piketty and Saez 2006: 203]. McAdoo's faith in and reliance upon borrowing during a time of emergency proved the value of deficit spending and emboldened those who advocated fiscal policy to fight business recessions and unemployment.[29] McAdoo's belief – novel for his time – that public opinion could be changed and mobilized to provide the will and the way to achieve great things provides a continuing foundation for an optimistic, progressive, and democratic view of our free-market capitalist economy.[30]

The world of finance has generated few leaders of heroic stature, but William Gibbs McAddo should be high on any list of nominees.

[29] An unfortunate bit of his legacy is the federal debt ceiling which has entangled and sometimes paralyzed our political system of decision making.

[30] Propaganda is indeed powerful, but it can also be used for evil. A useful reminder is the paper "Radio and the Rise of Nazi in Pre-war Germany" by Maja Adena et al [2013].

An Addendum for Economists

> The widespread tendency in empirical studies of economic behavior to discard war years as "abnormal," while doubtless often justified, is, on the whole, unfortunate. The major defect of the data on which economists must rely – data generated by experience rather than deliberately contrived experiment – is the small range of variation they encompass.

Milton Friedman (1952).

This quotation from a now largely-forgotten journal article, "Price, Income, and Monetary Changes in Three Wartime Periods," seems, *a priori*, to justify a closer look at the economics of World War I.[31] After all, outliers have a strong disproportionate influence on estimated relationships. In his article Friedman offers to explain why the price inflations experienced during the three wartime periods he examined, the Civil War, World War I, and World War II, were similar in magnitude while the underlying roles played by the mobilization, economic expansion, taxation, borrowing, and price controls were so different. His answer – no surprise in retrospect – was that monetary expansions explained the price changes more satisfactorily then did a simple income-expenditure (Keynesian) model.

The Friedman quotation comes with the qualification: omitting war experiences was "doubtless often justified." His article does nothing to explore this exception. However, it is worth asking what would justify the neglect of such data. Economic theories are simplifications that are often stripped down to the bare elements to make them tractable for the analysis of a particular issue of interest. One reason for excluding wartime data is that the theory under examination is tailored in such a way that it is ill suited to the study of a war economy. This is where Friedman went wrong. He applied a simplified version of the income-expenditure model inappropriately to World War I.

[31] This article was published in the *American Economic Review* and represents the first fruits of Friedman's long collaboration with Anna Schwartz. They had been working together since 1948. Schwartz hints that she did most of the quantitative work [Schwartz 2004: 396 and 401] although her name was not attached to the article or mentioned in the acknowledgement note. The article has been forgotten because it was overshadowed by Friedman and Schwartz's *The Monetary History of the United States* which was published in 1963 and covered much of the same ground. Friedman reprinted the article in his collection *The Optimal Quantity of Money and other Essays* [1969].

Friedman's measure of the fiscal impact during periods of war was the size of the fiscal deficit. He says:

> The income-expenditure theory instructs us to pay little or no attention to the quantity of money or its behavior but to look for an explanation of the divergent behavior of money income in a correspondingly divergent behavior of "autonomous" or "income-creating" expenditures. But the facts appear inconsistent with this explanation. In all three wars government expenditures are the dominant autonomous expenditures to which the income rise must be attributed by the income-expenditure theory and taxes the chief "leakage" other than savings [Friedman 1952: 622].

But the anomaly of World War I was the sharp, sizable, and *autonomous* rise in the saving-income ratio. Figure 8 charts my measure of personal saving as a fraction of disposable income for 1900 to 1929. The jump up during the war is evident. It is even more pronounced when personal saving is expressed as a percentage of "permanent/life-cycle income."[32] Clearly, changes of this magnitude are not explicable with the simple version of Keynes' stable consumption function implicitly adopted for Friedman's test. But, in retrospect, it is easy to see that the Liberty Bond campaign with its extraordinary appeal to patriotism produced an autonomous downward shift of the Keynesian consumption function. Keynes noted the possibility that "abnormal or revolutionary circumstances" could shift the otherwise "fairly stable" relationship he postulated between consumption and income [1936: 91, 96].[33] Had Friedman considered the Liberty Bond campaign as a source of autonomous change he would have reached a different conclusion.

It is not my objective to make Friedman's 1952 article a straw man. Rather I wish to call attention to the important role the rise in saving played in financing the war, moderating the inflation, and establishing the role of – and limits to – the McAdoo plan. This history, it seems

[32] Disposable income dramatically rose above its long term-trend during the war years. Economic theory expects that saving out of transitory income would be high, thus saving compared to trend income would be a higher fraction than when compared to current income [Friedman 1957, Ando and Modigliani 1963, Hall and Mishkin 1982, and Bernanke 1984].

[33] Note that Goldsmith [1955: volume I, p. 29], Modigliani [1966: Appendix B, column 10 and footnote 9, pp. 215-217], and David and Scadding [1974: Table 2, p. 355] all quite appropriately exclude World War I from their tests of saving theories.

to me, is an example of a natural experiment of the efficacy of direct efforts by the government (or business or banking) to changing saving behavior.

There is no room for doubt; many households purchased Liberty Bonds during the war. Figure 9 graphs the holdings of U.S. government securities (almost entirely Liberty Bonds) by households.[34] In 1919, with the war over and won and the Victory Loan drive concluded by June, we might presume that the pressure to hold liberty bonds was relieved. However, the public was urged to continue to hold on to their bonds. In August the Treasury Department warned that some owners were “willing to sacrifice these securities at prices far below the market in order to satisfy the desire for luxuries or to secure stock on which they are promised an impossibly high rate of interest.” The fear expressed was that consumption thus financed would accelerate the inflation before production could catch up [*New York Times* 27 August 1919 quoting a Treasury Department statement]. How influential such warnings were is unclear. But it was not long before households began to reallocate their asset portfolios away from bonds. The figure illustrates the decline in holdings that began in 1920 and continued through 1930. Institutional purchases, primarily by banks during the recession in 1922, took up only a small fraction of the bonds sold by the public.[35] So the disinvestment after 1919 was largely the result of Treasury retirements through the mechanism of a congressionally-authorized sinking fund financed by government surpluses during the 1920s. These retirements facilitated the portfolio adjustments of private households, but they were designed primarily to support the price of bonds on the open market [Gilbert 1970: 130, 173]. This was thought to be only fare to the patriots who sacrificed to purchase in the nation’s time of need. Except during the “liquidity squeeze” of 1920 the yields on Liberties were kept close to par [Kang and Rockoff 2006: Figure 4].

The chart of the movements of the aggregate personal saving rate (Figure 8) also suggests that saving defined to include consumer durables did not decline to below pre-war levels after

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[34] The chart cumulates the data on personal saving in the form of U.S. securities presented in the data appendix, Table 2, column 8. These estimates were made by Raymond Goldsmith [1955, volume I, table T-6, column 18, p. 354].

[35] Changes in institutional holdings of government securities are reported by Goldsmith [1955, volume I, table T-48, pp. 533-536.

the war was over and the propaganda push ended.[36] We might have expected otherwise. The abnormal saving during the war would have swelled households' asset portfolios and thus eased the burden on households to accumulate to reach a target level of wealth by retirement.[37] I suggest that one reason that a decline is not evident is that the war experience and the war bond propaganda produced an increase in the fraction of the population that engaged in life-cycle saving. This would counteract any tendency for aggregate saving rates to decline. However, the end of the war should have caused some wealth holders to readjust their asset portfolios shifting away from government bonds towards other assets. Martha Olney has accumulated a good deal of evidence that such a shift took place as households increased their holdings of consumer durable goods (automobiles, furniture, household appliances, and other major durables). "Households did not save *less* in the 1920s than they did previously, but, rather, they saved *differently* [Olney 1991: 54 emphasis in the original]. We might say that the funds received when Liberty Bonds were retired were used to fund durable good purchases.[38]

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[36] The timing is complicated by the sharp recession in output that occurred between 1920 and 1921. The post-war pattern was established by the years 1923-1929.

[37] I might add to this hypothesized reduction in the need to save, the proliferation of company pension plans in the 1920s. Most of these plans were unfunded but it is possible that the anticipated benefits reduced the motivation to save from personal income. From the point of view of a worker these promises constituted "pension wealth" much as the pay-as-you-go Social Security System created "Social Security wealth." On the appearance of company pensions and their expansion during the 1920s see Roger Ransom, Richard Sutch, and Samuel Williamson [1993]. On the possibility that social security wealth might reduce savings rates see Martin Feldstein [1974], Dean Leimer and Selig Lesnoy [1982], and Franco Modigliani and Arlie Sterling [1983].

[38] Durable goods (automobiles in particular) are large expenditures. They are primarily debt-financed and illiquid. Durables purchases should be relatively sensitive to liquidity constraints and imperfections in the market for consumer loans [Olney 1991]. As Frederic Mishkin has shown increased financial asset holdings are a powerful encouragement to durable goods expenditures because they provide liquidity and circumvent credit market imperfections [1976].

Figure 1. Liberty Bond Poster by the nationally-prominent artist Howard Chandler Christy, 1917 [public domain, image from the State Library of North Carolina, call number: Gray A-707 U.S. RBC Folio-2]. Prior to the war Christy had published magazine illustrations for *Life, Leslie's Illustrated Weekly, Century Magazine, Scribner's Magazine*, and *Harper's New Monthly Magazine* and was famous for a portrait of the Rough Rider Theodore Roosevelt.

Figure 2. William McAdoo (1863-1941), Woodrow Wilson's Secretary of the Treasury (1913-1918), circa 1914 [Everett Collection, number 15033]. The *New York Herald* described him as “very tall, very slight … something of a dreamer in his deep set eyes, something of dynamic energy in his long, slight, sinewy body, something of a race horse in the impression of his whole self” [Craig 2013: 36]. The *New York Times* elaborated. “Sometimes, he does not seem to know what to do with his legs or his arms. In personality, however, he is … a sweetness and light man. His smile is all pervasive” [*New York Times* 23 November 1918: 2].

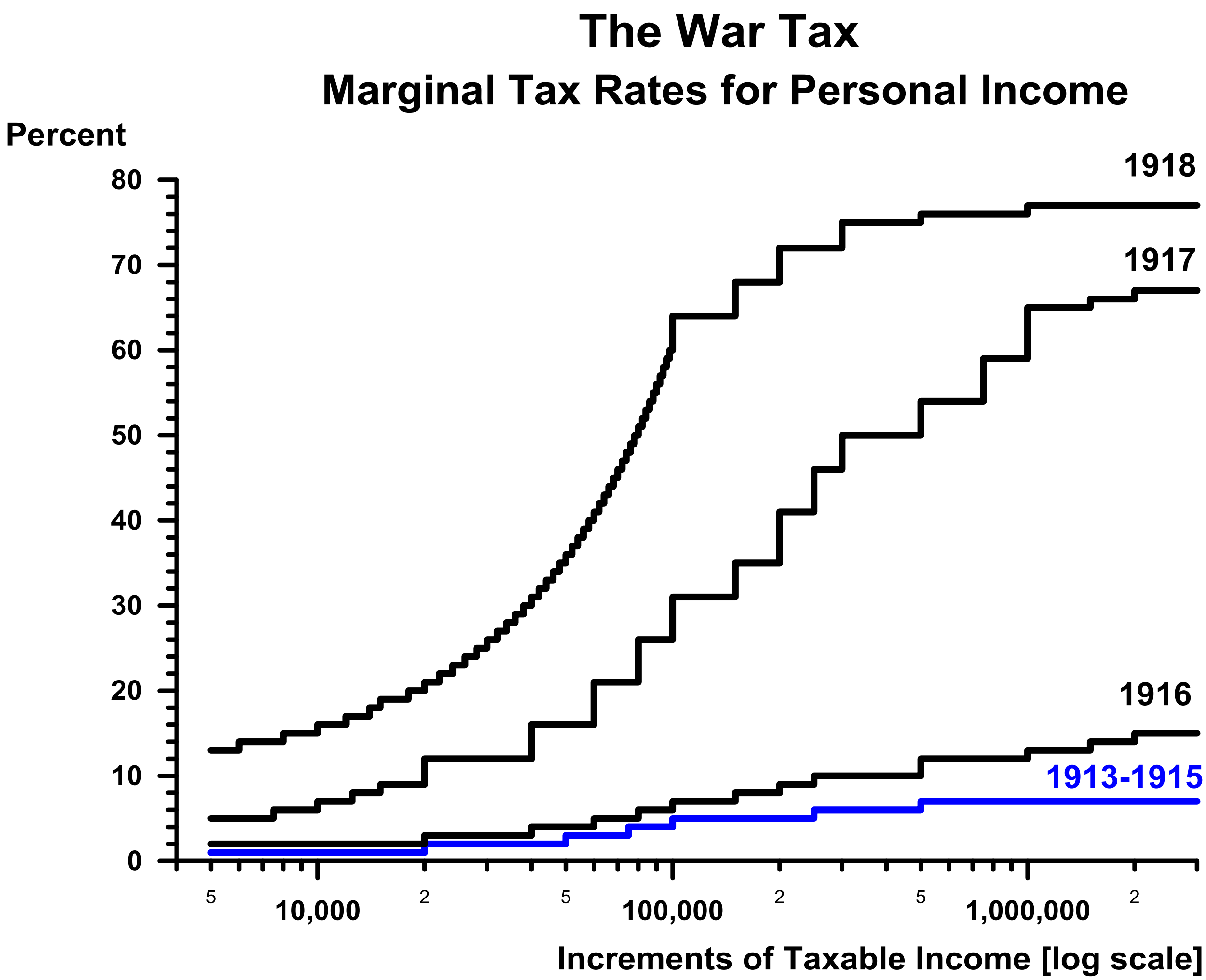


Figure 3. Federal income taxes only fell upon the rich, a "class tax" as it was called. Income taxes were introduced in 1913, but the war-time emergency led Congress on McAdoo's urging to impose very high marginal rates. For income earned in 1918 the tax on all increments of income over one million dollars was 77 percent [Source: Robert Murray Haig, "The Revenue Act of 1918," *Political Science Quarterly* 34 (3) September 1919: Table 5, pp. 390-391].

Figure 4. "Douglas Fairbanks Boosting Charlie Chaplin to Boost the Liberty Loan in Front of the Sub-Treasury Building: All Wall Street Looking on with Approval," April 8, 1918 [*New York Times Collection,* Museum of Modern Art, MoMA Number: 2204.2001].

Figure 5. Ruth Law (1887-1970), circa 1916 [probably public domain, original source unknown]. The front page of the *New York Times* reported on November 21, 1916: “A hundred and twenty pounds of pluck called Ruth Law glided her little old 100 horse power ‘pusher’ aeroplane down on a swift wind out of a mixture of fog and Jersey smoke yesterday morning and landed on Governors Island, winner of the American non-stop cross-country aviation record, and breaker of all world’s records for women fliers” [*New York Times* 21 November 1916: 1].

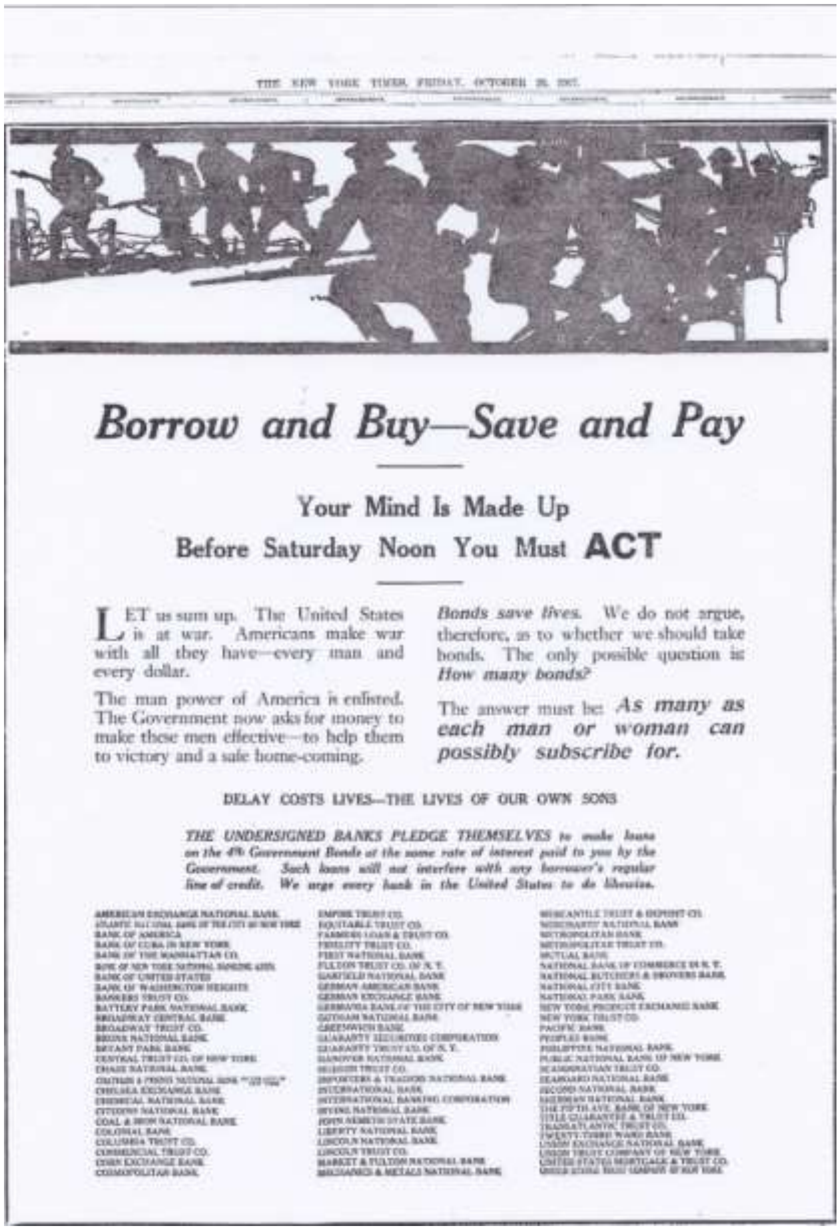
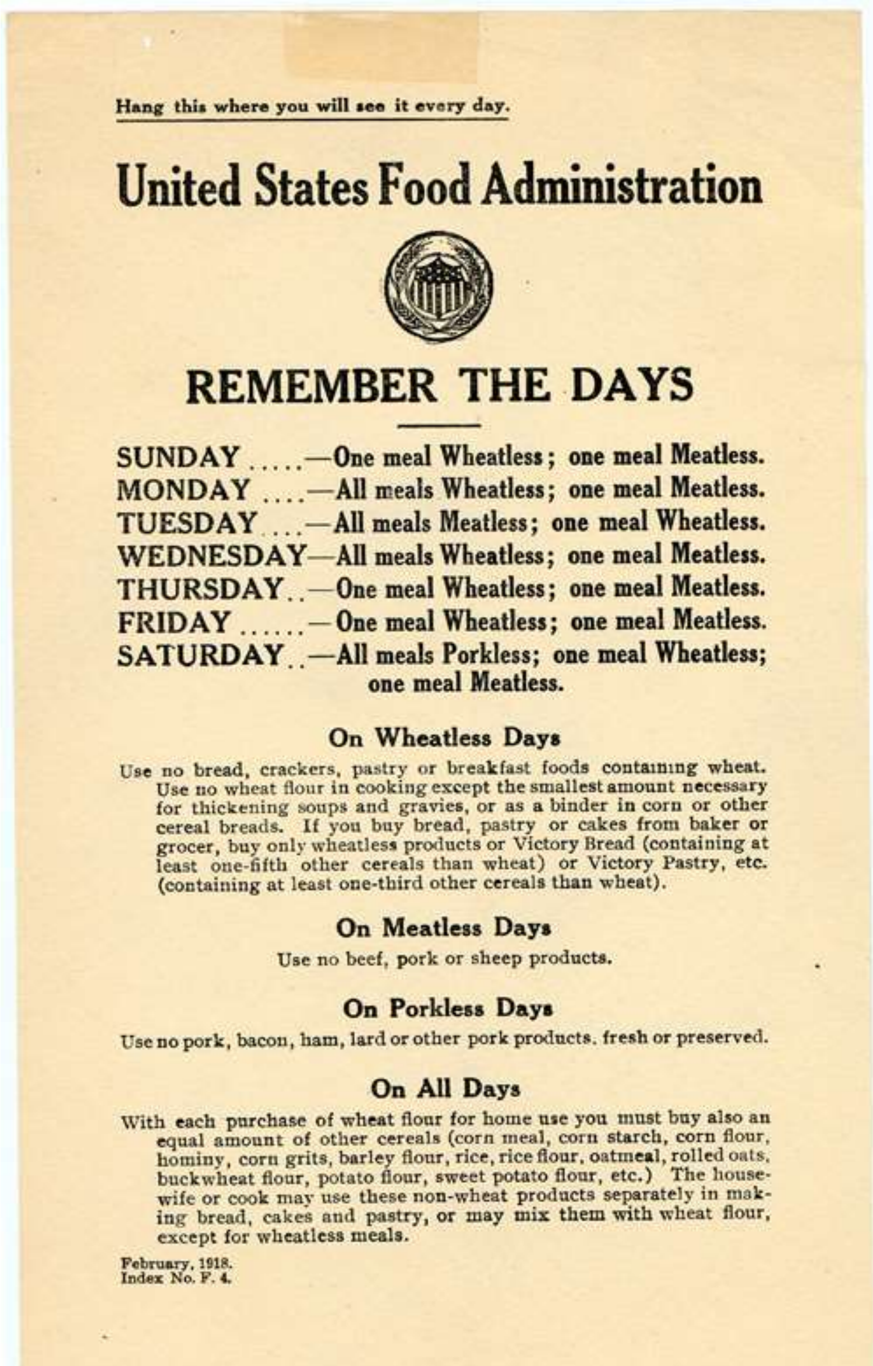


Figure 6. A public service advertisement describing McAdoo's "Borrow and Buy" plan that allowed commercial banks to indirectly fund a portion of the Liberty Bond drive. The description reads: "THE UNDERSIGNED BANKS PLEDGE THEMSELVES to make loans on the 4% Government Bonds at the same rate of interest paid to you by the Government. Such loans will not interfere with any borrower's regular line of credit. We urge every bank in the United States to do likewise" [*New York Times* 26 October 1917: 7].



Hang this where you will see it every day.

United States Food Administration

REMEMBER THE DAYS

SUNDAY .....—One meal Wheatless; one meal Meatless.
MONDAY ....—All meals Wheatless; one meal Meatless.
TUESDAY ....—All meals Meatless; one meal Wheatless.
WEDNESDAY—All meals Wheatless; one meal Meatless.
THURSDAY..—One meal Wheatless; one meal Meatless.
FRIDAY ......—One meal Wheatless; one meal Meatless.
SATURDAY..—All meals Porkless; one meal Wheatless; one meal Meatless.

On Wheatless Days

Use no bread, crackers, pastry or breakfast foods containing wheat. Use no wheat flour in cooking except the smallest amount necessary for thickening soups and gravies, or as a binder in corn or other cereal breads. If you buy bread, pastry or cakes from baker or grocer, buy only wheatless products or Victory Bread (containing at least one-fifth other cereals than wheat) or Victory Pastry, etc. (containing at least one-third other cereals than wheat).

On Meatless Days

Use no beef, pork or sheep products.

On Porkless Days

Use no pork, bacon, ham, lard or other pork products, fresh or preserved.

On All Days

With each purchase of wheat flour for home use you must buy also an equal amount of other cereals (corn meal, corn starch, corn flour, hominy, corn grits, barley flour, rice, rice flour, oatmeal, rolled oats, buckwheat flour, potato flour, sweet potato flour, etc.) The housewife or cook may use these non-wheat products separately in making bread, cakes and pastry, or may mix them with wheat flour, except for wheatless meals.

February, 1918.
Index No. F. 4.

Figure 7. Herbert Hoover's Food Administration claimed that 13-million households signed a pledge to follow these voluntary guidelines (February 1918). This sheet was to be hung "where you will see it every day." Note the tape marks at the top, indicating that the original owner had, indeed, once posted it [public domain].

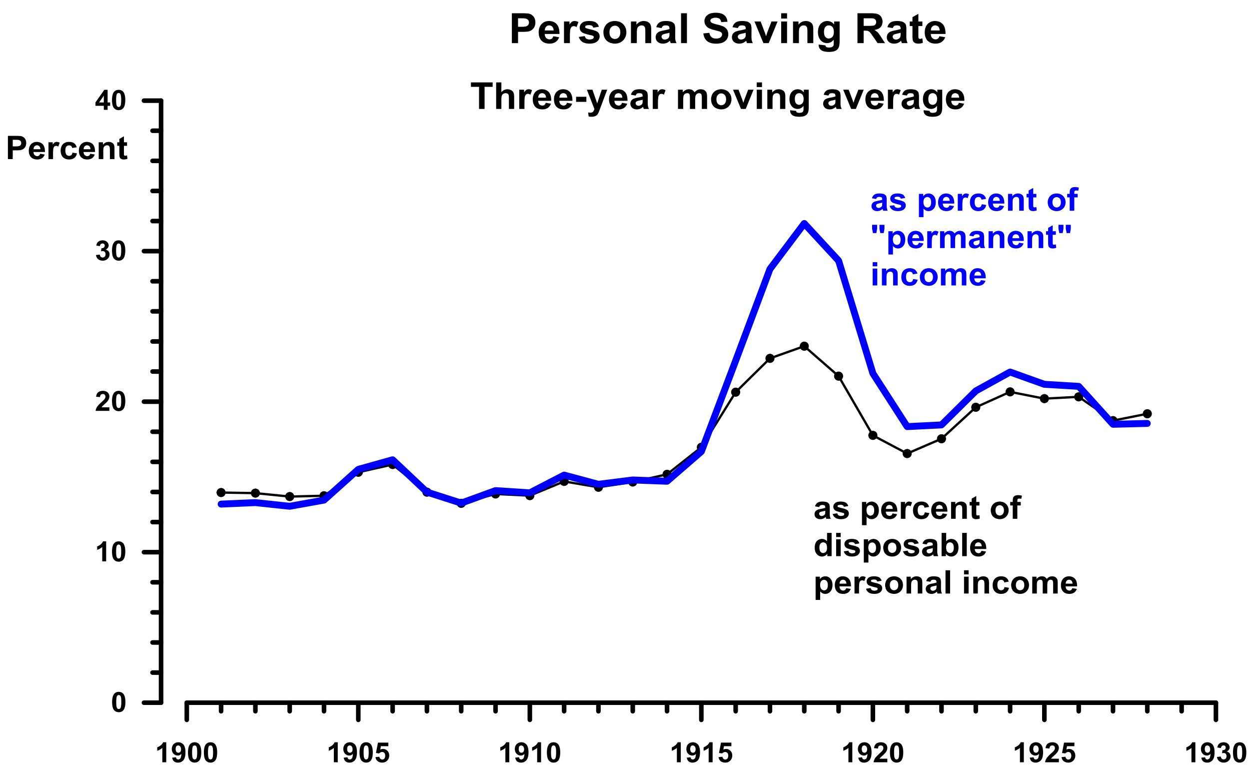


Figure 8. The personal saving rate, 1900-1929, plotted as a three-year moving average alternatively of disposable personal income and of permanent/life-cycle income. Source: Data appendix, Table 1, columns 18 and 19.

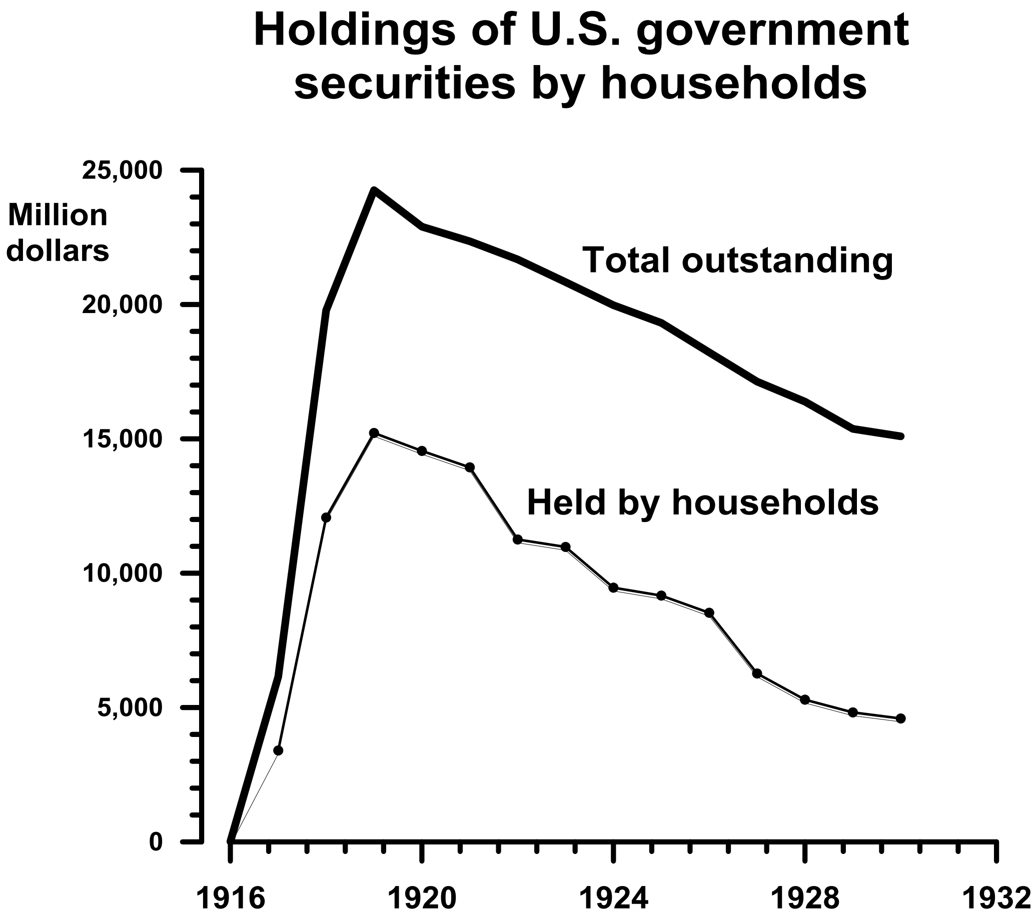


Figure 9. Almost all interest-paying government securities were Liberty Bonds. The decline of the total volume outstanding of these securities was a consequence of a government repurchase plan after 1921 designed to keep bond prices close to par. Since purchases by institutional holders were small, the decline in holdings by households mirrored the volume outstanding. Source: Data appendix, Table 2, columns 8 and 11.

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