Complications for the United States from International Credits: 1913 -1940*

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Abstract

The start of World War I in August 1914 brought investment decisions by private US citizens that influenced US foreign policy and then federal expenditure, monetary, debt management, and taxation policies in unintended and long-lasting ways. After the US entered the War in April 1917, the US Treasury borrowed \$23 billion from US citizens and lent \$12 billion to 20 foreign nations. What began as foreign loans during the war had by the early 1930s become subsidies.

Keywords— Debt management, foreign credits, risk-free yields, income tax rates

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The granting of foreign credit is a first step toward the establishment of an aggressive foreign policy Adams (1887, p. 25)

Money is the worst of all contrabands. ... I know of nothing that would do more to prevent war than an international agreement that neutral nations would not loan to belligerents. Secretary of State William Jennings Bryan to President Woodrow Wilson, August 10, 1914

We are going into war upon the command of gold. Senator George Norris. Speech before the Senate, April 4, 1917. 65th Cong., 1st Session.

It is the instigators of this war who deserve to bear this lead weight of billions. Let them drag it through the decades to come, not us. Dr. Karl Helfferich, Secretary of State for the Treasury, 20 August 1915 speech before the Reichstag.

And forgive us our debts, as we forgive our debtors. Matthew 6:12, King James Bible.

It is highly improbable that Congress or popular opinion in this country will ever permit cancellation of any part of the debt of the British Government to the United States as an inducement towards a practical settlement of the reparation claims. Woodrow Wilson to David Lloyd George, 2 November, 1920.

1 Introduction

Before 1914, the US was a net *debtor* to foreigners. But in 1887, the American economist Henry Carter Adams had forecast that US economic growth and falling returns on US securities would eventually transform the US into a net foreign *creditor*. Adams said that would threaten George Washington's "true policy to steer clear of permanent alliance with any portion of the foreign world."

It lies altogether within the range of possibilities that the city of New York, like the cities of London and Paris, should become a storehouse of capital to which the sovereigns of petty states may resort to fill their depleted treasuries. This tendency is fraught with danger to the policy of isolation thus far maintained by the United States, and it becomes an important question, what attitude this country should assume with regard to the interests of those who place their funds beyond the control of American law. One of two policies must be declared, nor ought the nation to be permitted to drift in this matter. Either citizens of this Republic should know that money placed in foreign bonds is at their own risk, or they should prepare themselves to see questions of foreign policy become much more important than they now are. It seems, then, from whichever point of view we consider the question, that the United States can not reasonably expect to avoid political complications sure to come with an extension of international credits; and it is on this account desirable that the Federal Government should present a clearly formulated policy, upon which the public may rely. Adams (1887, pp. 37-38)

We do not know whether Professor Woodrow Wilson had read Henry Carter Adams's 1887 book, but we do know that Secretary of State Williams Jennings Bryan conveyed the essence of Adams's message to President Wilson in an August 10, 2014 letter that we reproduce in appendix B. President Wilson rejected Secretary Bryan's advice to prohibit US citizens from lending to belligerents. Instead, in 1914 Wilson urged but did not compel US citizens to be "impartial in thought as well as in action." American banks and other investors ignored Wilson's advice and bought billions of dollars of UK and French government bonds.¹ J.P. Morgan and Company marketed those bonds to US citizens and also served as sole agent for the British and French governments when they purchased billions of dollars of war supplies from US producers.

When war began in August 1914, the UK was a net creditor to the United States. During the war, the UK government forced its citizens to exchange their US securities for British sovereign debt, then used those securities as collateral for sovereign UK bonds sold to American citizens. By the late fall of 1916, the UK government had nearly exhausted that collateral. Therefore, on November 27, 1916 at the urging of President Wilson, who by then had reconsidered his rejection of Secretary Bryan's August 2014 advice, the Federal Reserve Board publicly warned US citizens not to buy more British or French government debt.² UK citizens and civil servants including John Maynard Keynes welcomed the Federal Reserve Board's message because they were then using the UK government's financial distress to strengthen their recommendation that the UK accept what Woodrow Wilson would soon

 $^{^{1}}$ As Hofstadter (1948, ch. 10, Part IV) says of Wilson's recommendation, "but he and his most important advisers were utterly incapable of obeying the injunction themselves.

²See Link (1965, p. 202), Meyer (2006, p. 422), and Tooze (2014, p. 51).

call a "peace without victory."³

But hawkish British and German government officials interpreted the November 27 Federal Reserve memorandum as only a temporary setback to British credit in America and focused instead on what they recognized as the same decisive interest that Henry Carter Adams had identified in 1887: private US creditors of the UK and French governments and US export producers who had benefited from those credits wanted Entente victory. Opponents of peace without victory in both the UK and Germany pointed to those American interests. Hawkish Germans argued that, because American private creditors had lent so much to Entente governments, the US would soon enter the war on the Entente side, whether or not Germany began unrestricted submarine warfare.⁴ Germany resumed unrestricted submarine war on February 1, 1917, and the US entered the war on April 6, 1917. The US thus failed to "avoid political complications sure to come with an extension of international credits" as forecast by Henry Carter Adams in 1887.⁵

2 Complications from international credits

Before the US entered the war on April 6, 1917, it was private US bond holders who had lent to the British and French governments. Afterwards, it was the US government. On April 24, 1917, President Wilson signed the First Liberty Loan Act. It authorized the Treasury to borrow up to \$5 billion and to purchase up to \$3 billion of Entente and allied debts. Britain and France soon refinanced their short-term debts to private US citizens by borrowing from the US government, which in turn borrowed from US citizens.⁶ Congress eventually passed three more Liberty Loan Acts and one Victory Loan Act. Table 1 describes features of the

³See Skidelsky (1983). President Wilson coined the phrase "peace without victory" in his January 22, 1917 speech to the United States Senate. That speech contains a description of conditions for a sustainable peace that President Wilson and the other victors would ignore at the Peace Conference at Versailles: "Victory would mean peace forced upon the loser, a victor's terms imposed upon the vanquished. It would be accepted in humiliation, under duress, at an intolerable sacrifice, and would leave a sting a resentment, a bitter memory upon which terms of peace would rest, not permanently, but only as upon quicksand. Only a peace between equals can last. Only a peace the very principle of which is equality and a common participation in a common benefit. The right state of mind, the right feeling between nations, is as necessary for a lasting peace as is the just settlement of vexed questions of territory or of racial and national allegiance." Wilson changed his mind about these things after the US entered the war.

⁴Hofstadter (1948, ch. 10) and Tooze (2014) document this self-confirming alignment of beliefs. ⁵Schuker (1988) describes complications and consequences.

⁶In June 1918, roughly \$1.75 billion in private loans to Britain and France remained outstanding.

	Coupon Rate	Issue Date	Call Date	Maturity Date	Convertible?	Issued (billions)
First Liberty Loan	$3\frac{1}{2}$	Jun 1917	Jun 1932	Jun 1947	yes^\dagger	\$2.0
Second Liberty Loan	4	Nov 1917	Nov 1927	Nov 1942	yes^\dagger	3.8
Third Liberty Loan	$4\frac{1}{4}$	May 1918		$\mathrm{Sep}\ 1928$	no	4.2
Fourth Liberty Loan	$4\frac{1}{4}$	Oct 1918	Oct 1933	Oct 1938	no	7.0
Victory Liberty Loan [‡]	$3\frac{3}{4}, 4\frac{3}{4}$	May 1919	Jun 1922	May 1923	no	4.5

\$21.4

Table 1: Liberty and Victory Loans

[†]If the Treasury issued a new series of bonds at a higher interest rate prior to the end of the war, investors in the First and Second Liberty Loans could exchange their bonds at par for new bonds with the maturity date and call provisions of their original series but with the coupon rate and tax exemptions of the subsequent series. There was no limit to the number of times holders of the First Liberty Loan could exercise this option, but holders of the Second Liberty Loan could exercise this option only once.

[‡] The Victory Liberty Loan paid a $3\frac{3}{4}$ coupon per annum if the coupon payments were exempt from federal income taxes; otherwise, this loan paid a $4\frac{3}{4}$ coupon per annum.

Liberty Loan bonds.⁷ By making them convertible, Congress insured purchasers of First and Second Liberty Loan bonds against risk that interest rates would rise. Purchasers of these bonds could convert them at par into new bonds with the same maturity date and call provisions as their original loan but with the coupon rate and tax provisions of subsequent issues. Higher later coupon rates did indeed induce many owners of First and Second Liberty Loan bonds to exercise those conversion options. Of the nearly \$2 billion First Liberty Bonds sold, about \$560 million were converted into higher coupon-paying bonds. Of the nearly \$4 billion Second Liberty Bonds sold, nearly all were ultimately converted.⁸

Between 1917 and 1920, the US War and Navy departments spent \$20 billion and the Treasury extended \$9.5 billion in loans to Britain, France, Italy, and eight other allies of Entente countries.⁹ After that, the Treasury extended credits to an even larger group of

⁷The table omits an important feature of Liberty Bonds that underlies the story told by Edwards (2018): Liberty bonds contained a gold clause promising to pay interest and principal in gold coin. Congress abrogated the gold clause in both private and public debt contracts in 1933, provoking a sequence of legal challenges culminating in four cases decided by the Supreme Court mostly but not entirely in the government's favor in February 1935. One of the four cases, *Perry v. United States*, involved Perry's request that the government honor its promise to pay his Fourth Liberty Loan bonds in US gold coin or its equivalent.

⁸The conversion rate was lower for the First Liberty Bonds because conversion to a higher coupon bond also meant a less favorable tax treatment.

⁹Through the Liberty Loan Acts, credits were granted to Belgium, Cuba, Czechoslovakia, France, Great

Debtor	To USA To Britain		To France	Total
Belgium	\$172	\$422	\$535	\$1,129
France	1,970	$1,\!683$		$3,\!653$
Great Britain	3,696			$3,\!696$
Greece		90	155	245
Italy	1,031	1,855	75	2,961
Jugoslavia (Serbia)	11	92	297	400
Portugal		61		61
Romania		78	220	298
Russia	187	2,472	955	$3,\!614$
Total	\$7,067	\$6,753	\$2,237	\$16,057

Table 2: Inter-Allied Indebtedness at the Armistice in millions of dollar.

Source: War Debt Supplement, The Economist, November 12, 1932, page 2.

countries in order to finance US sales of surplus war materials and US relief supplies to Europe.¹⁰ By December 1922, a total of 20 nations owed the Treasury \$11.8 billion (\$10.1 billion in principal and \$1.7 billion in interest in arrears). The face value of those foreign loans represented 52 percent of privately-held US federal debt and 16 percent of US GDP in 1922.¹¹

Table 2 summarizes a network of international debts and credits that had emerged at the end of the War and that framed political questions that would preoccupy statesmen and citizens for the next 15 years. Should debts be paid? By whom? Should price levels and exchange rates of currencies in which loans were denominated be adjusted to redistribute resources between creditors and debtors within and across countries? Should governments discriminate between domestic and foreign creditors?¹²

During the war, both German and French finance ministers had answered the whoshould-pay question. The German finance minister assured the Reichstag that the "lead weight of billions" would be carried by Germany's enemies.¹³ Meanwhile, the French finance minister assured the French parliament that *France's* enemies, not Germany's, would service French war bonds.

Britain, Greece, Italy, Liberia, Romania, Russia and Serbia.

¹⁰The nine countries granted just post-war credits were Armenia, Austria, Estonia, Finland, Hungary, Latvia, Lithuania, Nicaragua, and Poland.

 $^{^{11}\}mathrm{For}$ us, the terms 'face value' and 'par value' mean the same thing.

 $^{^{12}}$ This question and the previous ones underlie the struggles chronicled by Edwards (2018).

¹³See the speech by Karl Helffrerich cited by Taylor (2013, ch. 2, Loser Pays All).

With more foresight, a war time French finance minister could have said that the burden of paying French war bonds would fall either on France's enemies or on its foreign *friends* or maybe on its domestic creditors and tax payers. Deciding would preoccupy Europeans and Americans from the time of Armistice on November 11, 1918 until the trough of the world depression in 1933. Failed improvisations postponed a permanent settlement until 1933. In 1919, John Maynard Keynes had urged immediate agreement to what would ultimately be the disposition of postwar international loans and reparations.¹⁴ Keynes said that the US should write down its loans to the UK, France, and Italy in exchange for their accepting smaller reparations from Germany. Keynes said that would reset national balance sheets in ways that would foster reconstruction of international monetary and trading systems. It is true that in 1922 Congress established the World War Foreign Debt Commission to write down and reschedule outstanding Treasury credits to foreign governments, but not until 1933 would governments accept the comprehensive adjustments that Keynes had recommended in 1919. By then a fragile monetary and trading system assembled in the 1920s had collapsed because it had depended on what turned out to be too optimistic assumptions about both macroeconomic growth and politically sustainable fiscal-monetary policies.

3 **Purpose and organization**

This paper constructs a quantitative account of Henry Carter Adams's "political complications sure to come with an extension of international credits" by the US during World War I, the absence in 1914 of "a clearly [US] formulated policy, upon which the public may rely," outcomes brought by the absence of such a policy, and their consequences for US federal monetary and fiscal arrangements in the 1920s and 1930s.¹⁵ We apply an accounting framework described in appendix A.¹⁶ We work in the Davis Dewey (1912) tradition of spotlighting objects in government budget constraints and balance sheets. These objects frame financial questions created by Adams's "political complications" and our answers to them: How large were the US government credits extended to foreign governments during the war? How big were the promised and realized federal income streams generated

¹⁴See Keynes (1920, 1922), Steiner (2005, ch. 4), Tooze (2014, pp. 295-299), and Clarke (2017, chs. 11-13).
 ¹⁵The phrases in quotes are again from Adams (1887, pp. 37-38).

¹⁶We use some of the data on prices and quantities of all bonds issued by the US government from 1776 to 1960 that have been collected and organized by Hall et al. (2018).

by these credits and how did those quantities compare with interest payments on federal debts issued during the War? How did defaults, reschedulings, and repudiations of foreign credits, and fluctuations in rates of growth of GDP, nominal interest rates, inflation, and primary federal government budget surpluses, contribute to the evolution of the federal debt to GDP ratio?¹⁷

Although we focus mainly on the period during and after World War I, we also compare outcomes with those from a period of similar length: during and after the US Civil War. The Civil War experience set precedents that US policy makers naturally consulted during and after World War I.^{18,19} Two 1913 reconstructions of US fiscal-monetary infrastructure distinguished the situations confronting Congress during the Civil War and World War I: the Federal Reserve System, and the 16th amendment to the US constitution and a Revenue Act of 1913 that authorized a federal income tax. The US used both of these new institutions to help finance World War I. By way of contrast, the US entered the Civil War without a federal income tax and without either a central bank or a national banking system. Although Civil War Congresses levied a federal income tax and constructed a new National Monetary System, it took time to get the administrative machinery up and running. The US entered World War I with a Federal Reserve system and a federal income tax ready to go, having only to choose monetary policy actions and set income tax rates within established institutions.²⁰

¹⁷Our accounting exercises are designed to shed light on just some of the broader web of complications described with authority and wide command of primary sources in books by Eichengreen (1992), Steiner (2005), and Tooze (2014).

¹⁸President Wilson's Treasury Secretary and son-in-law William Gibbs McAdoo sought to borrow in a more orderly way than he thought the Union had managed during the Civil War. McAdoo (1931, p. 373) said that he "did not get much in the way of inspiration or suggestion from a study of the Civil War, except a pretty clear idea of what not to do." For example, rather than improvising 19 separate securities as the Union had during the Civil War, McAdoo convinced Congress to finance the war mostly by sequentially issuing five securities.

¹⁹Hall and Sargent (2014) compare fiscal aspects of the Civil War with those in the War of 1812 and the War for Independence.

²⁰As part of his critical analysis of the way the Union had financed the Civil War, Adams (1887, pp.134-135) observed that "it is easier to raise the rate of existing taxes than to establish a new system of duties. From this it follows that the germ of a war policy lies back in the treasury policy of ordinary times." He recommended that "... the permanent system should be so adjusted as to respond quickly to any change in rates imposed, and this can be easily done by fixing the ordinary rate of taxation below the maximum revenue rate." Adams (1887, p. 132) performed an interesting counterfactual experiment in which he estimated the consequences for Union finances of having immediate access to revenue sources that the Congress established only during the war.



Figure 1: US Federal Expenditures by Types as Percents of GDP



Figure 2: US Federal Revenues by Types as Percents of GDP



Figure 3: Face Value of US Treasury Debt and Face Value of Foreign Securities Held by the Treasury (including accrued interest)

Note: US Treasury debt excludes securities held in US government accounts and by the Federal Reserve.

4 Debts, credits, values, and returns

4.1 Overview

Figures 1, 2, and 3 set the scene.²¹ Figure 1 shows the big rise in military expenditures as well the granting of large foreign credits during the war. The war brought a permanent rise in federal expenditures as a fraction of GDP. Figure 2 shows that while federal revenues as a fraction of GDP rose during the war, they rose much less than expenditures. That discrepancy gave rise to the war time growth of federal government debt depicted in figure $3.^{22}$ The book values in figure 3 show that during the war the US Treasury borrowed large amounts and lent large sums to European combatants.²³ Book values indicate that net US government indebtedness was actually substantially less than the gross amount depicted in figure 3 because large fractions of outstanding US Treasury bonds were "backed" by claims on foreign governments. How much "backing" those credits would in fact put behind US Treasury bonds, and how much relief they would bring the US taxpayers who were ultimately responsible for servicing those bonds, would depend on how faithfully those foreign debtors honored their obligations to the US Treasury. In the end, they would pay

²¹Bassetto and Galli (2017) provide an information theoretic answer to the question "Is Inflation Default?"

²²However, during the war a sizeable fraction of the interest bearing federal debt was owned by the Federal Reserve System. Please see the third paragraph of subsection 5.1.

²³President Wilson called them associates, not allies.

only small fractions of what they had promised, but it would take a long time for all parties to accept that.

We want to know how accurately the book values in figure 3 approximate market values.²⁴ Figure 4 shows that book and market values of outstanding Treasury bonds approximate each other pretty well. This need not have occurred; it is a consequence of the way the Treasury managed its debt in light of market interest rates. In section 7, we describe how we use prices and quantities of individual bonds to measure the total market value of Treasury debt.

4.1.1 Returns

Figures 5 and 6 show two ways of depicting nominal and real returns on the Treasury bond portfolio. Figure 5 shows annual nominal and real net returns, while figure 6 shows the real and nominal outcomes of purchasing \$100 of the bond portfolio in January 1917 and continually reinvesting proceeds in a rebalanced portfolio of Treasury securities. Figure 6 reveals how US price level movements influenced real returns.

4.1.2 Price level movements

In figure 3, both federal debts and foreign credits are denominated in US dollars, so the US price level shaped the value of those debts and credits in terms of goods and services. Figure 7 indicates that the logarithm of the US price level rose especially rapidly after the US entered the War in 1917, then showed a sharp drop in 1920-21 and a larger and longer one from 1929 to 1933 that nevertheless left the price level in 1933 23% above its prewar level. These price level movements coincided with European combatants leaving the gold standard during the war, their postwar implementations of monetary experiments that replaced precious metal monies with paper monies,²⁵ and subsequent modifications and terminations of those experiments carried out during the depression of the 1930s.²⁶ The US, which imperfectly but nominally remained on the gold standard during the war,²⁷ shared a 1920-21 price level drop with European countries that were then deciding at what

 $^{^{24}}$ Distinguishing between book and market values of government debt is a theme of Dias et al. (2014) and Hall and Sargent (2011).

²⁵These experiments were designed to reap the gains in efficiency and price level stability promised by David Ricardo's 1816 proposal for a well managed paper currency; see Ricardo (1816, p. 35).

 $^{^{26}\}mathrm{Rothbard}$ (2002) contains an imaginative account of these experiments.

²⁷The US embargoed exports of gold for much of 1914, 1918, and 1919.



Figure 4: Ratio of Market Value to Par Value of Privately Held US Treasury Debt

rates to exchange their currencies for gold, politically charged decisions that would redistribute wealth among domestic private creditors and their domestic debtors. UK domestic creditors who owned pound-denominated claims on the UK government earned high real returns when the UK restored convertibility of the pound to gold at the prewar par of 4.80 dollars per pound in April 1925, while domestic creditors of the French government who owned franc-denominated claims fared badly when France ultimately resumed convertibility of the franc to gold at 20% of its prewar value. The period of slowly rising US prices from 1922 to 1929 in figure 7 coincided with the UK's success in temporarily establishing an international "gold exchange standard" that decreased monetary demands for gold by making IOUs denominated in British pounds a reserve currency for British Empire Dominions and colonies and much of Europe as well.

4.1.3 Nominal versus real returns

While reschedules, defaults, and repudiations shaped dollar values of the US Treasury's *credits*, US inflation shaped real values of those credits and also of the US Treasury's debts. By affecting both the price level movements in figure 7 and the US government debt and credit dynamics in figures 3, US and foreign monetary-fiscal policies influenced the rate of return outcomes summarized in figures 5 and 6. Figure 5 shows nominal and real one-period returns on a value-weighted re-balanced portfolio of US treasury bonds, while figure 6 shows cumulative nominal and real values coming from continually reinvesting in that portfolio,



Figure 5: Nominal and Real Returns on the US Treasury's Bond Portfolio



Figure 6: Nominal and Real Values of 100 invested in January 1917 in US Treasury's Bond Portfolio



Figure 7: Natural Log of US Price Level

starting with an initial investment of \$100 on January 1, $1917.^{28}$ Figure 6 reveals that the 1920-21 price level drop brought the real value back to its initial value after war-time inflation had reduced it by 1/4. Creditors of the US government earned high real returns from 1929 to 1933 and low ones from 1933 to 1937.

5 Comparison with Civil War

During the 1920s and 1930s in both the US and in Europe, the distinction between nominal and real returns on government bonds was on the minds of policy makers and bond holders. For example, Treasury Secretary Andrew Mellon wrote:

The real value of the dollar, that is, its value in terms of goods it will purchase, does not remain constant. The experience with our Civil War debt was that we borrowed a 54-cent dollar and repaid an 85-cent dollar (using the 1860 value as the base) or, in other words, we paid back in value \$3 for every \$2 we borrowed. Using 1913 as a base, our present war debt was borrowed on a 51-cent dollar, and to-day the dollar is worth 66 cents. If the appreciation of the dollar continues – and such has been fiscal history after other great wars – then the longer we

Source: NBER, Indicator m04051

²⁸The nominal value at time t is $100 \times \prod_{s=1917:1}^{t} (1 + r_{s,s+1})$, where $r_{s,s+1}$ is the nominal net return on the portfolio between month s and s+1. The real value at time t is $100 \times \prod_{s=1917:1}^{t} \frac{1+r_{s,s+1}}{1+\pi_{s,s+1}}$, where $\pi_{s,s+1}$ is the inflation rate between month s and s+1. Thus, the real value is reported in units of January 1917 dollars.

postpone payment the more in real value we will have to pay. Mellon (1926, p. 7)

Like Secretary McAdoo before him,²⁹ Secretary Mellon sought lessons from the Union's fiscal and monetary policies implemented during the US Civil War.

Figure 8 compares the logarithm of the US price level during and after World War I with a period of the same length during and after the US Civil War. The US price level had returned nearly to its prewar level twenty years after the start of the Civil War in 1861; twenty years after the US had entered World War I in 1917, the price level was still 63% above its 1914 level. But in 1933, the same gold standard discipline that had pushed the price level to its prewar value after the Civil War seemed to be driving it back toward its pre-World War I level.³⁰ The Roosevelt administration did not want the wealth redistributions that this would have brought, so it pursued a policy designed to restore the price level to its 1928 or 1929 level.³¹

There were important differences in international and domestic monetary arrangements during the two post war episodes compared in figure 8. During the US Civil War, the UK remained on the gold standard while the United States left it and made a paper currency called the greenback a legal tender and unit of account in which the log price levels in figure 8 are recorded. After 1862 and before the US Treasury returned to gold in 1879 by promising to trade one greenback dollar for one gold dollar, one gold dollar traded for more than one greenback dollar. By way of contrast, during and after World War I, it was the UK and other European countries that had abandoned the gold standard while the US, until 1933, more nearly remained on gold.³² Europe's leaving gold lowered the relative price of gold by decreasing world demand for gold for monetary uses; that changed the price of gold relative to most goods and services, and that in turn exported inflation from Europe to the US.³³ The UK temporarily restored the pound to its prewar exchange rate in 1925,

³³Hawtrey (1919) described the workings of this mechanism during monetary disturbances in France

²⁹See footnote 18 above.

 $^{^{30}}$ See Wood (2009).

³¹Milton Friedman (1975, p. 75) argued that "departing from gold was not necessary" for Roosevelt to pursue the price level he sought through monetary policy. Friedman noted that Viner (1933) had argued that the US could engineer inflation without raising the price of gold above \$20.67 an ounce. See Buchanan and Tideman (1975) for alternative views about Roosevelt's actions about the gold standard. See Edwards (2018, p. 39) for an account of a proposal authored by James Warburg to reduce the Federal Reserve's gold coverage ratio in a way that would allow the Fed to conduct operations that would facilitate monetary expansion and a controlled rise in the US price level while remaining on gold at the pre-1933 price of 20.67 dollars per troy ounce.

 $^{^{32}\}mathrm{Again},$ the US embargoed exports of gold for much of 1914, 1918, and 1919.



Figure 8: Natural Log of US Price Level During and After Two Wars

Note: The ticks on the x-axis correspond to August for the 1856 to 1884 period and January for the 1912 to 1940 period.



Figure 9: Real Values of \$100 invested in January 1861 and January 1917 in US Treasury's Bond Portfolio



Figure 10: Real Returns on Treasury Portfolio During and After Two Wars, Annual by Fiscal Year

but then left the gold standard permanently in September 1931. By December 1931, one UK pound had fallen from its value of \$4.87 in August 1931 to about \$3.7.

Figure 9 compares real rates of return on the US government bond portfolio across the post Civil War and the post WWI periods.³⁴ US Treasury creditors suffered similar cumulative real losses during both wars, and although they enjoyed cumulative gains after both wars, they fared better 20 years after the Civil War than they did 20 years after World War I. Comparing the log price levels in figure 8 with the cumulative real returns in figure 9 indicates how price level movements helped award bond holders bigger cumulative real returns after the Civil War than after World War I. Not wanting to let the price level sink to its pre World War I level, the Roosevelt administration promoted a monetary policy that aimed to restore the price level to its 1929 level.³⁵ Because he rejected international restrictions on US monetary policy, in late June 1933, President Roosevelt directed the US delegation to the London Economic Conference not to assist international efforts temporarily to stabilize exchange rates of the US dollar to the currencies of France, the UK, and other countries. Appendix D reproduces Roosevelt's "bombshell message" to the

and the UK from 1789 to 1821.

³⁴See footnote 28 for an explanation of how we computed the real value of the post-WWI portfolio. The real value of \$100 invested in January 1861 is computed in a like manner and is reported in January 1861 dollars.

³⁵That was the policy advocated by the Committee for the Nation to Rebuild Prices and Purchasing Power that influential businessmen organized in January 1933. See Rothbard (2002, p. 297). Rothbard tells how Irving Fisher transferred residual monies to the Committee for the Nation from the defunct Stable Money League that he had formed in 1921 to promote price level targeting.

conference in which he rejected superficial temporary measures in favor of ones designed permanently to restore the economic fundamentals on which a gold standard rests.³⁶ For President Roosevelt, those fundamentals included balanced national government budgets.

5.0.1 Different price-output outcomes after two wars

Figures 11 and 12 add measures of real output to the price levels presented in figure 8. There is a strong positive association between the price level and industrial output in the post World War I period in figure 12, but not in the post Civil War period depicted in figure 11. In both periods, contemporary commentators and statesmen complained about adverse deflation-induced redistributions from debtors to creditors that are the heart of Irving Fisher's (1933) debt-deflation theory of macroeconomic contractions.³⁷ What accounts for the different output-price associations during the two periods? One possibility is that the prevalence of gold clauses on railroad and other corporate bonds after the Civil War meant that bond payouts were indexed against deflation of the greenback, making deflation-induced redistributions much smaller after the Civil War.³⁸ In any event, the pronounced output declines that coincided with aggregate price level declines in the early 1930s convinced President Roosevelt to implement the advice of Irving Fisher and other advocates of price level targeting.³⁹

5.0.2 Returns and government debt levels

Figure 10 shows annual real returns on the Treasury bond portfolio during and after the Civil War and World War I. While it conveys less information than figure 9, approximating as it does the time derivative of that figure, figure 10 helps to identify years after each war in which a declining price level boosted real returns, and years after World War I in which

³⁶Notice Roosevelt's "specious fallacy" pun about commodity (specie) standards. Notice also how Roosevelt distinguished temporary from permanent policy actions, a distinction that 45 years later would become an important aspect of rational expectations macroeconomics. Rothbard (2002, p. 307) and Ferguson (1989, pp. 28–29) detected advisers who helped Roosevelt to formulate his policy and to write the "bombshell message" to the London Conference explaining it.

 ³⁷Gomes et al. (2016) create a quantitative structure that extends and formalizes a debt-deflation theory.
 ³⁸We have not located a source for the fraction of post Civil War corporate debt that was denominated in gold. We hope to collect that information in the near future.

³⁹See Rothbard (2002, pp. 297-298). Also, see Edwards (2018), especially his appendix on George F. Warren versus Irving Fisher, who used distinct theoretical and empirical justifications and implementation strategies for their price level targeting recommendations.



Figure 11: Natural Log of US Price Level and Per Capita Industrial Production from 1860 to 1879

Source: Price Level, NBER, Indicator m04051; IP, Davis (2004).



Figure 12: Natural Log of US Price Level and Per Capita Industrial Production from 1910 to 1939

Source: Price Level, NBER, Indicator m04051; IP, Miron and Romer (1990) and Federal Reserve.

a rising price level depressed real returns.⁴⁰

The immense growth of US government debt during World War I shown in figure 1 is an arithmetic consequence of the discrepancy between the federal government expenditure path shown in figure 1 and the total federal government revenue path shown in figure 2. US World War I finance bears tell-tale signs of a Barro-Gallatin recommendation to finance net-of-interest deficits during a war with increases in government debt, then after a war to run net-of-interest surpluses just sufficient to service the war-enlarged government debt.⁴¹ In this respect, the deficit during the depression in the 1930s exhibits fiscal features of a war.⁴² Figure 1 shows what appears to be a permanent increase in the level of non-interest government expenditures after the War, even before the onset of the depression in 1930. A permanent increase in federal government expenditures also occurred during the Civil War.

5.1 Financial repression and subsidies

During and after the Civil War, the Union forced national banks to buy Union bonds (see Dewey (1912)). During World War I, the US used a less direct approach. Although it extended short-term credit to the Treasury, the Federal Reserve Banks did not buy bonds directly from the Treasury. Instead, they lent large sums to banks belonging to the Federal Reserve system by discounting loans secured with Liberty Loans as collateral. In this way, the Fed engineered substantial increases in the monetary base that helped finance the War. Figures 13 and 14 show the effects of these and other operations during the War as well as an unwinding of the Fed's balance sheet after the War, especially during the 1920-1921

⁴⁰Real returns on US government debt between 1933 and 1935 displayed in figures 6 and 9 were key ingredients of the Supreme Court's 5-4 nuanced majority opinion in *Perry v. United States.* The court decided that the US government's defaulting on its promise to pay Liberty Bond holders in gold coin was unconstitutional. But it also decided that the benign real returns on those bonds between 1933 and 1935 meant that bond holders had suffered no damages and therefore were entitled to no compensation. See Edwards (2018, pp. 173-175).

⁴¹See the 1807 report of the Secretary of Treasury authored by Gallatin (1837) and Barro (1979) for a more formal treatment. For an analysis of the Barro tax smoothing model and its relationship to consumption smoothing models and other tax smoothing models, see https://lectures.quantecon.org/py/smoothing.html.

⁴²Presidents Hoover and Roosevelt both pronounced rousing analogies between fighting wars and fighting depressions. Both Presidents struggled with whether to invoke the 1917 wartime Trading with the Enemy Act for executive authority to take measures to fight the financial crisis and depression. Because during the last days of his administration he did not receive the political cover he sought from from President elect Roosevelt, President Hoover declined to invoke the Act in order to impose a bank holiday. President Roosevelt did invoke the Act. See Edwards (2018, p.27).

recession and the associated world-wide downward movements in price levels that occurred then.⁴³

The Federal Reserve supported the Treasury in several ways. It directly purchased certificates of indebtedness from the Treasury. Governors of Reserve Banks organized and led committees in each district to sell Treasury bonds. The Federal Reserve supported a program of "borrow and buy" that encouraged individual investors to finance purchases of Liberty Loans by borrowing from their local banks, which could then discount those loans at the Fed's discount window. The Treasury designated the New York Fed as its agent for bond sales. The Fed lent at preferred discount rates to banks that purchased Treasury certificates of indebtedness. The Fed lent to member banks at a preferred discount rate if the proceeds were used to purchase Liberty and Victory bonds that the Fed accepted as collateral.

The Fed's balance sheet summarized in figures 13 and 14 shows that, through these operations, the Fed temporarily monetized over a billion dollars of Treasury securities

For the Federal Reserve's assets, before the passage of the June 1917 amendment, Gold reserves are the sum of Gold coin and certificates in vault, Gold Settlement fund, and Gold redemption fund. After this amendment, Gold with Federal Agents and Gold with foreign agencies are included in the Gold Reserves. Gold reserves include Gold held against Federal Reserve Notes starting in November 1919, and Gold and Certificates held by banks starting in December 1923. Reserves Other than Gold are Legal tender notes, silver, etc. Discounted US Government Securities are Bills discounted: Secured by U.S. Government obligations, and Discounted Private Securities are Bills discounted: All other. US Government Securities Bought Outright include Bills bought in open market, US government bonds, US victory notes, Treasury notes, and US certificates of indebtedness. All Other Assets are the sum of Non-Reserve Cash, All other earning assets/other securities, Bank Premises, Gold in transit or in custody in foreign countries, Due from other Fed Banks (in transit), Due from Foreign banks, Uncollected items, Federal Reserve Notes, net assets, Five per cent redemption fund against Federal Reserve Bank notes, All other assets, and Federal Deposit Insurance Corporation stock.

For the Federal Reserve's liabilities, *Reserve Deposits* are the sum of Government Deposits/U.S Treasurer general account, Due to Members - reserve account/Member bank reserve account, Due to non-member banks clearing account, Deferred availability items, Reserved for Government franchise tax, Foreign bank, and Other deposits. Prior to the June 1917 amendment, *Federal Reserve Notes* are all notes and banknotes in circulation, net gold held by Federal Reserve Agents. After June 1917, *Federal Reserve Notes* records all Federal Reserve notes and banknotes in circulation. All Other Liabilities are the sum of Capital paid in/Capital accounts, Surplus Funds, Special deposits, Reserve for contingencies, and All other liabilities.

⁴³The source of the weekly data displayed in figures 13 and 14 is the table *Resources and liabilities of* each Federal Reserve Bank at the close of business on Fridays reported in each issue of the Federal Reserve Bulletin.

The sharp increase in gold reserves on the assets side and Federal Reserve Notes in circulation on the liabilities side of the balance sheet that occurred on June 22, 1917 is due to an amendment of the Federal Reserve Act which permitted Federal Reserve Banks to count gold held by its Federal Reserve Agent as part of its required note reserve. Prior to this amendment, the liability of Federal Reserve Banks on outstanding Federal Reserve notes was reduced by the amount of gold held by the Federal Reserve Agent instead of the gold being considered as a collateral reserve.



Figure 13: Federal Reserve Assets

Source: Board of Governors of the Federal Reserve System (1915-1940).

(note the war time increase in both bills discounted in figure 13 and the increase in Federal Reserve notes in figure 14). This means that during the War, a substantial amount of the Treasury debt in figure 3 was not held by the public but by the Fed. Figure 15 shows time series of pertinent money market rates that determined spreads on these portfolio operations. During the subscription period for the First Liberty Loan from May 15 to June 15, 1917, member banks could borrow from the New York Fed at 3 percent to buy bonds at par that paid 3.5 percent coupons. As the four Liberty Loan bond drives and the Victory Loan bond drive progressed and as coupon rates on Treasury bonds increased, so did the New York Fed's preferred discount rate; but it always remained below the coupon rates and market yields of newly issued Treasury securities. Those spreads motivated US citizens to finance purchases of Treasury bonds by borrowing from banks.

Friedman and Schwartz (1963) describe how Treasury officials persuaded the Federal Reserve to keep interest rates low in order to help the Treasury sell Victory Loan bonds and how that led the Fed belatedly to administer excessive interest rate increases that they say worsened the sharp 1920-1921 downturn in real economic activity in the US. While figure 15 shows how the Fed increased rates during this period, our attention is also drawn to the substantial unwinding of the Fed's indirect holdings of Treasury securities reflected in two salient quantities of figures 13 and 14, namely, bills discounted and Federal Reserve Notes, respectfully. The substantial 1920-21 decrease in the US price level, apparent from figure 7, set the stage for the high real returns on Treasury securities in the 1920s displayed in



Figure 14: Federal Reserve Liabilities

Source: Board of Governors of the Federal Reserve System (1915-1940).



Figure 15: New York Fed Discount Rates Secured by Liberty and Victory Loans, Yields on Liberty and Victory Loans, and Coupon Rates for Liberty and Victory Loans

figure 5.

6 Foreign credits

We don't know market values of the foreign credits depicted in figure 3 because these intergovernmental obligations were not marketable.⁴⁴ But a sequence of defaults, reschedulings, and repudiations eventually drove plausible estimates of the discounted values of prospective payment streams to the US government below the book values of those foreign credits.⁴⁵

Figure 16 reports three time series that summarize original book values (the blue line), renegotiated book values (the red line), and what these payment streams would have been worth if there had been perfect foresight (the green line). Thus, in place of observed market values, the green line shows the present value of what ex post were the continuation flows of actual payments to the Treasury at each date. The blue line shows original book values before a sequence of Treasury write-downs of those book values following a sequence of reschedulings in the early and mid 1920s, recorded as the red line in figure 16. The red line tracks our estimates of what would have been the market values of claims to those promised flows had these flows been risk-free and had the claims to them been traded. We formed these estimates by valuing promised flows of payments to the Treasury by the Hicks-Arrow prices of risk-free claims that we inferred from market prices of the Treasury's own securities.⁴⁶ Because it uses Hicks-Arrow prices for risk-free claims, the red line undoubtedly overstates what those credits would have traded for had they been marketable. The three largest negotiated settlements are readily apparent: Great Britain, signed on June 19, 1923 and recorded on Treasury's books on July 1923; Italy, signed on November 14, 1925 and recorded on the Treasury's books on May 1927; and France: signed on June 15, 1927 and recorded on the Treasury's books on April 1930.

Figure 17 is a counterpart to figure 6. It shows nominal and real values of \$100 invested in the Treasury's portfolio of foreign credits in December 1919 with earnings being

⁴⁴This section is intended to complement and supplement the account of Schuker (1988).

 $^{^{45}}$ The Treasury and the World War Foreign Debt Commission recognized these haircuts implicit in the re-negotiated payment schedules. In Appendix C we reproduce a table from the United States World War Foreign Debt Commission (1927, p. 443) reporting the present values of the rescheduled repayments using constant discount rates by country. Depending on the discount rate used, the aggregate haircut, as measured by the Commission's own calculations, ranged from 1/4 to 1/2.

⁴⁶We use Hicks-Arrow prices that Hall et al. (2020) inferred from market prices and quantities of Treasury bonds.



Figure 16: Face Values and Capitalized Values of Promised and Realized Flows from Foreign Credits

continuously reinvested in the portfolio.⁴⁷ Figures 16 and 17 confirm that ultimately the foreign credits extended by the US to combatants during World War I failed to provide much "backing" behind the Treasury bonds issued to finance those credits. *Ex post*, those credits turned out mostly to be subsidies.

To indicate the burden that the write-downs of these foreign credits imposed on the American taxpayer, we report in figure 18 the annual flows of earnings that would have flowed from the capitalized values in figure 16 as percentages of annual official Treasury interest payments. The blue line reports the implied annual cash flow from the total principal of foreign credits amortized at 5 percent, the original interest rate on Treasury loans to foreign governments. The red line reports the renegotiated promised repayments. Even after the rescheduling, these promised repayments represented roughly 30 percent of offi-

$$100 \times \prod_{s=1919:12}^{t} (1 + r_{s,s+1}),$$

where $r_{s,s+1}$ is the nominal return on the portfolio between months s and s+1. The real value at date t is

$$100 \times \prod_{s=1919:12}^{t} \frac{1+r_{s,s+1}}{1+\pi_{s,s+1}},$$

where $\pi_{s,s+1}$ is the inflation rate between months s and s+1. Thus, the real value is reported in December 1919 dollars. Prior to President Hoover's debt moratorium in 1932, we computed the discounted value of the stream of promised payments; after the moratorium, we computed the perfect foresight discounted value of the stream of actual future payments.

 $^{^{47}\}mathrm{The}$ nominal value at date t is



Figure 17: Nominal and Real Values of \$100 Invested in December 1919 in the Foreign Credits owed to the US Treasury



Figure 18: Promised Flows of Payouts from Foreign Credits as Percents of Official Interest Payments on US Treasury Debt

cially reported interest payments. Two back-of-the-envelope calculations put magnitudes of the reschedulings into perspective:

1. In 1930 the Allies were scheduled to make \$218 million in payments to the US; without the reschedulings, the Allies would have had to pay five percent of the outstanding principal, \$544 million. This \$326 million reduction in payments amounted to \$2.67 per person in the US at a time when US per capita income was \$748.

To translate this reduction from dollars to tax rates, note that in 1929 the Treasury proposed and Congress passed a temporary tax cut⁴⁸ that reduced tax rates on individual incomes by 1 percentage point⁴⁹ and reduced the tax rate on corporate income from 12 percent to 11 percent. The Treasury estimated that this tax reduction would "with reasonable accuracy" decrease income tax revenue by \$160 million per year, which equaled half the difference between the pre-haircut and post-haircut payment flows that we have estimated.⁵⁰

2. The difference between the pre- and post-haircut payment flows was about 4/10 of 1% of GDP. The Treasury raised about 2% of GDP using the personal income tax with total federal revenue being roughly 5% of GDP.

From 1925 to 1931 the top marginal tax rate was 25%. To increase revenue from 2% to 2.4% of GDP, the Treasury would have had to raise rates by 20 percent (assuming no reduction in the tax base). Assuming a parallel shift in the tax schedule, the top marginal rate would have had to rise to 30%.

7 Bond prices and quantities

This section describes how we have transformed information in US Treasury accounts to match concepts in macroeconomic theory. We describe concepts appearing in figures 3 and 4 that report total government debts and in figures 5 and 6 that report real and nominal returns on government debt. We link these concepts to decompositions of representations of government budget constraints that appear in government accounts and in macroeconomic

⁴⁸Joint Resolution of Congress, No. 133, approved by President Hoover on December 16, 1929.

 $^{^{49}}$ That is, the tax rates of 1.5 percent on the first \$4,000 of taxable income, 3 percent on the next \$4,000, and so on ... were reduced to 0.5 percent on the first \$4,000 of taxable income, 2 percent on the next \$4,000, and so on.

⁵⁰See page 24 of the 1929 Annual Report of the Secretary of the Treasury on the State of the Finances.

theories. Appendix A describes an accounting framework that reports the relationships among objects in play. Among these objects for each date t are:

- a list of bonds $i = 1, \ldots, n_t$.
- for each bond *i*, a price p_i^t , a list of promised future coupons payments $c_{i,t+j}^t$, $j = 1, \ldots, J(i)$, and a book value that takes the form of principal payment $b_{i,t+J(i)}^t$ that the government promises to pay when the bond matures at t + J(i).
- a list of Hicks-Arrow prices $\{q_{t+j}^t\}_{j=0}^{J(t)}$ telling the number of dollars that at time t exchange for a government promise to pay one dollar at time t + j.⁵¹
- a Hicks-Arrow-Debreu pricing equation $p_i^t = \sum_j q_{t+j}^t c_{i,t+j}^t + q_{t+J(i)}^t b_{i,t+J(i)}^t$ that links the price of each bond at time t to the present value of its coupon stream and principal.
- sums over bonds of promised coupons $c_{t+j}^t = \sum_i c_{i,t+1}^t$ and sums over bonds of promised principals $b_{t+j}^t = \sum_i b_{i,t+j}^t$ that, when added, form the stream of payments $s_{t+j}^t = c_{t+j}^t + b_{t+j}^t$, $j = 1, \ldots, J(t)$ that at t the government has promised. (The notation s_{t+j}^t is intended to connote "strips.")
- A stream $\{y_t\}$ of Treasury net earnings from credits to foreign governments, a stream subject to defaults, renegotiations, repudiations, and extensions of more credits.
- A sequence of estimates $\{C_t\}$ of the discounted present value of the continuation of the earnings stream $\{y_t\}$.

Appendix A uses these concepts to explain discrepancies between objects that in the US Treasury accounts and in macroeconomic models bear the same names. For example, the Treasury measures total government debt by face or book value $\sum_j b_{t+j}^t$, while the object in a typical government budget constraint of macroeconomic theory is the market value $\sum_j q_{t+j}^t s_{t+j}^t$. Figure 4 plots their ratio, which stays as close to unity as it does as a result of a conjunction of the Treasury's debt management policy – its choice of a division of $\{s_{t+j}^t\}$ sequences between $\{c_{t+j}^t\}$ and $\{b_{t+j}^t\}$ sequences – and realized values of the bond yields that represent the Hicks-Arrow vector $\{q_{t+j}^t\}$ at each date in the manner described in appendix A. Figure 19 documents that the undiscounted sum of future coupons promised $\sum_j c_{t+j}^t$ has sometimes been nearly as large as the sums $\sum_j b_{t+j}^t$ that the Treasury reports as

⁵¹Ljungqvist and Sargent (2018, ch. 8) provide definitions and analysis of Arrow date-state prices.



Figure 19: Total Principal $\sum_{j=1}^{n_t} b_{t+j}^t$ and Principal + Coupons $\sum_{j=1}^{n_t} b_{t+j}^t + \sum_{j=1}^{n_t} c_{t+j}^t$ as Percents of GDP

its debt at time t. The Treasury and Federal Reserve jointly decide the division of Treasury obligations to the public between these two sums when they conduct "debt management" and "open market" operations.

US Treasury and macroeconomic theoretic accounts also differ in the quantities to which they attach the word "interest." These different quantities answer different questions. The Treasury interest concept measures total coupon payments coming due at time t. That quantity helps to inform "cash-management" policy because it estimates a component of the total cash payments that the Treasury is obligated to pay at t. The macroeconomics interest concept is the net rate of return – nominal or real – that the Treasury pays on a value-weighted portfolio of its outstanding bonds. Figure 20 compares time series instances of these two concepts. That the nominal return on the government bond portfolio in figure 20 is more volatile than the Treasury's measure of interest payments reflects fluctuations in market interest rates and capital gains on the Treasury's bond portfolio that are intermediated through the Hicks-Arrow prices $\{q_{t+j}^t\}$. For details, please see our discussion of equation (15) in appendix A.

Note: Privately Held US Treasury debt. It excludes debt held in US government accounts and by the Federal Reserve.



Figure 20: Nominal Returns (thin black) and Official Net Interest Payments (thick blue) as Percents of the Par Values of Debt, Annual by Fiscal Year

8 Post World War I tax policy

Congress repeatedly raised income tax rates during WWI, with rates at the top bracket eventually reaching more than 75%. Figure 21 graphs marginal income tax rates for the years between 1918 to 1925 and shows tax rate reductions after the War. In his first Annual Report in 1921, Secretary of Treasury Andrew Mellon made what later would be called a "supply-side" case for lowering income tax rates. He argued that the high tax rates at the upper bracket discouraged initiative, diverted savings into tax-exempt state and local bonds, and discouraged investors from realizing capital gains. In several subsequent Annual Reports, Mellon observed that increases in top marginal tax rates coincided with decreases in the number individual returns filed that reported incomes over \$300,000. Table 3, reproduced from Mellon's 1924 Report, shows that, as the marginal tax rate at the top bracket climbed from 15% in 1916 to more than 70% in 1920, the number of tax returns that reported incomes over \$300,000 fell from 1,296 to 395, with a corresponding drop in total income reported at the top bracket from \$992 million to \$246 million. This occurred even while total personal income rose from \$6 billion to \$23 billion over this period. Mellon's supply side arguments persuaded Congress to cut tax rates. As shown in figure 21, by 1925, Congress had reduced the top marginal income tax rate to 25%. The 1925 income tax rate structure allowed the federal government to collect about 2% of GDP from the income tax. See table 4.

The cuts in tax rates appear to have worked as Mellon had reckoned. Figures 22, 23,

Year	income tax, maximum rate	Total amount of net income returned	number of returns of net income in excess of \$100,000	net income returned by those returning in excess of \$100,000	$\begin{array}{c} \text{Percent} \\ (5) \text{ is} \\ \text{of } (3) \end{array}$	number of returns of net income in excess of \$300,000	net income returned by those returning in excess of \$300,000	Percent (8) is of (3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1916	15%	\$6,298,577,620	6,633	\$1,856,187,710	29.47	1,296	\$992,972,986	15.77
1917	67	$13,\!652,\!383,\!207$	6,664	1,606,516,153	11.77	1,015	731,372,153	5.36
1918	77	15,924,639,355	4,499	990,239,425	6.22	627	401,107,868	2.52
1919	73	19,859,491,448	5,526	1,169,553,048	5.89	679	440.011,589	2.22
1920	73	23,735,629,183	3,649	727,004,763	3.06	395	246,354,585	1.04
1921	73	19,577,212,528	2,352	463,003,351	2.37	246	153,534,305	0.78
1922	58	$21,\!336,\!212,\!530$	4,031	892,747,680	4.18	537	365,729,746	1.71

Table 3: Tax returns of those with net income in excess of \$100,000 and \$300,000, as compared with total of all net incomes returned, for the calendar years in which the tax accrues

Source: Annual Report of the Secretary of the Treasury, 1924, page 9.

	Reve	Percent	Per	
	Nominal	1929 dollars	of GDP	Capita
1914	\$71,381,275	\$126,187,950	0.20%	\$1.27
1915	80,201,759	141,052,991	0.21	1.40
1916	124,937,253	201,144,280	0.25	1.97
1917	$359,\!681,\!228$	480,603,700	0.60	4.65
1918	2,838,999,894	$3,\!229,\!220,\!995$	3.74	30.89
1919	$2,\!600,\!762,\!735$	$2,\!575,\!206,\!107$	3.32	24.51
1920	3,956,936,004	$3,\!382,\!350,\!985$	4.48	31.77
1921	$3,\!228,\!137,\!674$	$3,\!089,\!273,\!651$	4.39	28.46
1922	2,086,918,465	$2,\!131,\!718,\!146$	2.84	19.37
1923	$1,\!678,\!607,\!428$	$1,\!684,\!507,\!630$	1.97	15.05
1924	1,842,144,418	$1,\!845,\!376,\!251$	2.12	16.17
1925	1,760,537,824	1,720,365,825	1.94	14.85
1926	1,982,040,089	1,918,211,679	2.04	16.34
1927	2,224,992,800	$2,\!194,\!250,\!240$	2.33	18.43
1928	$2,\!173,\!952,\!557$	$2,\!173,\!952,\!557$	2.23	18.04

Table 4: Revenue from Individual and Corporate Income Taxes



Figure 21: Marginal Income Tax Rates: 1918 to 1925

Source: The tax schedules are from Tax Foundation (2013). The income thresholds are from Piketty and Saez (2003).



Figure 22: Average Tax Rate Paid by Income Groups Source: United States Internal Revenue Service (1920-1940)



Figure 23: Individual Income Tax Revenues Paid by Income Groups Source: United States Internal Revenue Service (1920-1940)



Figure 24: Shares of Income Taxes Paid by Income Groups Source: United States Internal Revenue Service (1920-1940)

and 24 report income tax revenues paid by individuals divided into five income groups as percentages of their personal incomes, as totals, and as shares of total income. Between 1918 and 1922, individuals reporting incomes over \$100,000 paid an average of 43.1% of their income in taxes and 35.5% of all income taxes. During the period of the Mellon tax cuts, from 1923 to 1931, individuals reporting incomes over \$100,000 paid only 17.1% of their income in income taxes, but the income tax revenues that they paid rose from \$200 million in 1921 to \$450 million in 1927 and to over \$700 million in 1928. Further, their share of total income taxes paid rose to 50%.

8.1 Income tax rate changes near start of the depression

In 1931, Congress raised income tax rates across the board, returning marginal tax rates on upper income taxpayers to pre-1925 levels. Those rate increases helped raise total revenues from the individual income tax by a factor of four from 1931 to 1936. But despite the sharp increase in taxes on the high income taxpayers, the increased tax burden fell disproportionately on lower income groups; between 1932 and 1939, individuals reporting incomes over \$100,000 paid 42.3% of their income in taxes, but their share of income taxes paid fell back to 36.6%.

9 Post World War I debt management

Figure 3 shows that privately held US Treasury debt peaked in August 1919 at \$24.3 billion. By December 1930 it had fallen to \$14.2 billion, a reduction of over 40% that took place through a steady reduction of nearly \$1 billion per year.⁵² Figure 25 shows that the average maturity of the federal debt rose during the war, but steadily declined afterwards.⁵³

World War I left Congress a debt management challenge. In October 1919, the US Treasury had \$26.2 billion in debts and a repayment schedule that would require it to pay \$4.5 billion when the Victory Loans came due in May 1923 (roughly 5% of GDP), \$4.0 billion in 1928 when the Third Liberty Loan came due, and then relatively little until 1938. Figure 26 shows that the four Liberty and Victory Loans comprised 80% of federal debt in 1920. Thus, financing the war with these medium-term bonds brought "echo effects" when

 $^{^{52}\}mathrm{In}$ the 11 years after the peak level of debt, the reduction had been only 25%.

⁵³After the Civil War, the Congress *lengthened* the average maturity of the debt. As chair of the World War Foreign Debt Commission, Secretary Mellon presided over an increase in the average maturity of the foreign debt owed to the US.



Figure 25: Average Maturity of Privately Held US Treasury Debt

large quantities of debt matured at a small set of dates.⁵⁴

Between 1920 and 1928, Secretary Mellon rescheduled the Victory Liberty Loan and Third Liberty Loan by replacing long term bonds with issues of a set of standardized new short-term securities: term notes and certificates of indebtedness. Mellon also refinanced the Second Liberty Loan. Figure 27, which reports our estimates of Treasury strip sequences $\{s_{t+j}^t\}$ for two dates shows both the echo effects and the effects of Mellon's refinancing operations on continuation sequences of strips.

We credit these refinancing operations to Mellon rather than to Congress because World War I brought a significant change in the assignment of authority over debt management. Before World War I, Congress designed each federal bond and typically specified the purposes for which the proceeds could be spent. That first changed with the Second Liberty Bond Act of 1917, which began a twenty year process during which Congress delegated virtually complete authority for bond design to the Treasury. And starting with the Second Liberty Bond Act of 1917, Congress allowed the Treasury to issue bonds not tied to specific projects or designated expenditures.⁵⁵

⁵⁴There is an active theoretical literature on optimal maturity structures of government debt. Faraglia et al. (2014), Bhandari et al. (2017a,b), and Aguiar et al. (2016) survey and contribute theories of the optimal maturity structure of government debt in settings that disarm the maturity-structure-is-irrelevant Modigliani-Miller theorems that prevail in complete markets models. Faraglia et al. (2014) and Bhandari et al. (2017a,b) focus on (time-inconsistent) Ramsey plans in incomplete markets settings. Aguiar et al. (2016) studies Markov perfect plans in which debt dilution opportunities induce governments to issue only short term debt along an equilibrium path.

⁵⁵See Garbade (2012) and Hall and Sargent (2015) for details.



Figure 26: Privately Held US Treasury Debt



Figure 27: Debt Service Profiles: 1920 and 1928

Note: "The Mellons" were six long term bonds issued between 1922 and 1928. Four were used to refinance the Victory Loans and the Second and Third Liberty Loans.

10 Evolution of the Treasury debt to GDP ratio

We use the government's consolidated budget constraint to decompose the evolution of the interest-bearing debt-GDP ratio into contributions made by nominal returns paid on Treasury securities of different maturities, GDP growth, inflation, Federal Reserve purchases and sales of Treasury securities, and net earning on the Treasury's foreign credits.⁵⁶ Using notation presented in Appendix A, let Y_t be real GDP and v_t the real value of a dollar (i.e., the inverse of the price level) at time t. Let B_t be the market value of privately held Treasury debt⁵⁷ and C_t be our estimate of the market value of foreign credits owed to the Treasury. Dividing each side of (19) by nominal GDP, $\frac{Y_t}{v_t}$, and rearranging terms yields:

$$\frac{v_t(B_t - C_t)}{Y_t} - \frac{v_{t-1}(B_{t-1} - C_{t-1})}{Y_{t-1}} = \sum_{j=1}^{n_t} r_{t-1,t}^j \frac{v_{t-1}B_{t-1}^j}{Y_{t-1}} - r_{t-1,t}(\pi_{t-1,t} + g_{t-1,t}) \frac{v_{t-1}B_{t-1}}{Y_{t-1}}$$

$$- \sum_{j=1}^{n_t} g_{t-1,t} \frac{v_{t-1}(B_{t-1}^j - C_{t-1})}{Y_{t-1}} - \sum_{j=1}^{n_t} \pi_{t-1,t} \frac{v_{t-1}(B_{t-1}^j - C_{t-1})}{Y_{t-1}}$$

$$- \frac{v_t f_t}{Y_t} + \frac{v_t(G_t - T_t)}{Y_t} - \frac{v_t(M_t - M_{t-1})}{Y_t} - \frac{v_t d_{t-1}M_{t-1}}{Y_t}$$
(1)

where $r_{t-1,t}^{j}$ is the nominal return on a *j*-period zero coupon bond between t-1 and t; $r_{t-1,t}$ denotes the value-weighted net nominal return on Treasury bonds; $g_{t-1,t}$ denotes growth in real GDP, and $\pi_{t-1,t}$ denotes inflation. The primary deficit, $G_t - T_t$, is the difference between total government spending and tax revenues. As described in equation (17) in appendix A, f_t is the net one-period payout to the Treasury from t-1 to t on the Treasury's portfolio of foreign credits, C_{t-1} . We let M_t denote the part of high powered money that is secured by collateral in the form of Treasury securities at time t (please see section 5.1 and figures 13 and 14 again), and we let d_t denote the discount rate on loans that the Federal Reserve makes to the public for the purpose of purchasing Treasury securities.

Among the terms in equation (1), we have independent measures of the market value of the Treasury debt, B_t ; the present value of the promised stream of foreign payments, C_t ; government spending and tax collections, $G_t - T_t$; the stock of Federal Reserve credit secured by Treasury securities, M_t ; real GDP, Y_t ; and the inverse of the price level, v_t . Appendix A

 $^{^{56}}$ The calculations here are based on formula (6) of appendix A and are *ex post* in contrast to the *ex ante* calculations of Hilscher et al. (2017).

⁵⁷This means that we have subtracted from the total market values the values of securities held by Federal Reserve Banks and US government agencies.

tells how we computed f_t by taking into account the credits extended to the allies during and immediately after the war, then tracking annual payments and repayments, and also by imputing capital losses to prospective payouts as a result of reschedulings, defaults, and repudiations.⁵⁸

10.0.1 Data sources

We used the formula $B_t = \sum_j q_{t+j}^t s_{t+j}^t$ described in section 7 to compute the market value of Treasury debt B_t . Data for promised payments streams $\{s_{t+j}^t\}_j$ at times t are from Hall et al. (2018). Hall et al. (2020) inferred Hicks-Arrow price vectors $\{q_{t+j}^t\}_j$ at each date t from prices of individual bonds at each date recorded in Hall et al. (2018).⁵⁹ We obtained data on government spending and revenues comprising the "primary" or net-of-interest deficit $G_t - T_t$ from issues of the Annual Report of the Secretary of the Treasury on the State of the Finances. We constructed estimates of the value of foreign credits C_t by discounting the continuation streams of scheduled payments $\{y_{t+i}\}_i$ country-by-country at each date t using the same zero-coupon yield curves that we used to price the Treasury debt. 60,61 We took into account changes in the promised flow of payments arising from renegotiations and repudiations. Notably, we assumed that market participants recognized in 1932 that President Hoover's moratorium on reparations and war debt payments would be permanent for the major debtor countries. Individual country repayment schedules are reported in United States World War Foreign Debt Commission (1927). To compute foreign payouts, f, we collected records of the inter-allied payments from various issues of the Annual Report of the Secretary of the Treasury. Our measure of Federal Reserve Credit M_t is the sum of discounted bills secured by government obligations and government securities owned outright by the Federal Reserve.⁶² The discount rate d_t is the New York Fed discount rate

 $^{^{58}}$ The terms in equation (1) leave a residual. This residual will include any mis-measurement of the government's accounts, approximation errors in our accounting, and changes in the value the government's other assets (e.g., the gold stock, its vast land holdings, the nation's railroads, ...) that we omit in our analysis.

⁵⁹Also see footnote 82 of appendix A.

⁶⁰By not adding risk-premia to these rates to account for what were at various times doubtful prospects that these prospective amounts would be paid, we know that we overstate the value of these foreign claims. This fact affects the timing of the "foreign payments" line in figure 29 but not its main features and not its beginning and ending values.

⁶¹See footnote 84 in appendix A.4 for an explanation of how we discounted promised payments beyond the horizon of our Hicks-Arrow price vectors.

⁶²These assets are recorded in the Federal Reserve balance sheets reported each month in Board of Governors of the Federal Reserve System (1915-1940).



Figure 28: Real GDP Growth and Inflation Measured by the GDP Deflator



Figure 29: Cumulative Sum of the Components of the Change in the Ratio of the Debt net of Foreign Credits to GDP

for loans secured by Liberty and Victory Loans on December 31 of year t.⁶³

For various values of t and τ , table 5 reports our decompositions of debt-GDP increments $\frac{v_t(B_t-C_t)}{Y_t} - \frac{v_{t-1}(B_{t-\tau}-C_{t-\tau})}{Y_{t-\tau}}$ into components attributable to (i) nominal interest payments, (ii) GDP growth, (iii) inflation, (iv) the primary deficit, (v) net payouts on Treasury owned foreign credits, (vi) Federal Reserve Credit, (vii) payments to the Fed, (viii) the cross term and (ix) the residual. Table 5 further decomposes contributions of nominal interest payments, GDP growth, and inflation by maturity.

Table 5 and figure 29 reveal the following patterns in the ways that the US borrowed,

 $^{^{63}\}mathrm{See}$ pages 6-7 of Board of Governors of the Federal Reserve System (1922).

repaid, grew, deflated, inflated, and paid its way toward higher or lower net-debt/GDP ratios:

- Prior to the US entry into the war, from 1910 to 1916, the net-debt/GDP ratio fell from 3.16 to 2.13. Of this 1.03% drop, 0.54 was due to real GDP growth and 0.54 was due to inflation.
- 2. During the war period from 1916 to 1918, the increase in the net-debt/GDP ratio from 2.13 to 12.72 was driven by large primary deficits. The extension of foreign credits offset a little less than half of these deficits. Negative nominal returns to bondholders, robust real GDP growth, a burst of inflation, and support from the Federal Reserve also mitigated the impact of these deficits on the net-debt/GDP ratio. The strong GDP growth and high inflation are apparent in figure 28. The negative nominal returns are evident in figures 5 and 6.
- 3. From 1918 to 1931, primary surpluses more than offset high nominal returns to bond holders. The rescheduling of the foreign credits lowered their value so that the contribution of foreign payoffs adds to the net-debt/GDP ratio during this period. Further the decline in the price level during the 1920s helped to push up the net-debt/GDP ratio.
- 4. From 1931 to 1938, the large increase in the net-debt/GDP ratio was driven by large fiscal deficits and the writing off of the foreign credits following the Hoover debt moratorium in 1931. With a few exceptions, payments on allied war debt to the US stopped in 1933.⁶⁴

Evidently, most of the impacts of nominal returns, GDP growth, and inflation on the debt to GDP ratio came via their effects on bonds with maturities greater than 5 years. During most of the period under consideration, the average maturity of the debt generally exceeded 8 years (see figure 25) since most the debt consisted of long term bonds like the Liberty Loans. See figures 26 and 27. Over the entire period from 1910 to 1938, contributions to changes in the debt to GDP ratio coming from nominal returns to bondholders were mostly offset by GDP growth and inflation.

⁶⁴In 1932, representatives from Great Britain, Germany and France met in Lausanne, Switzerland to formulate a plan for reducing both the German reparation payments and the Allied war debts to the US. The US Senate rejected that debt reduction plan in December 1932, so the WWI foreign credits and the accumulated interest in arrears remain on the US Treasury's books today.

	1910-	1913-	1916-	1918-	1923-	1931-	1910-
Period	1913	1916	1918	1923	1931	1938	1938
$Debt/GDP^{\dagger}$							
start	3.16	2.58	2.13	12.72	12.56	10.35	3.16
end	2.58	2.13	12.72	12.56	10.35	37.65	37.65
change	-0.58	-0.45	10.59	-0.16	-2.21	27.31	34.50
Contributions							
Nominal Return [‡]							
all maturities	0.13	0.22	-0.51	4.70	5.38	9.29	19.21
$j \leqslant 1$	0.01	0.01	0.02	0.63	0.43	0.48	1.60
$2\leqslant j\leqslant 4$	0.02	0.03	-0.01	0.81	1.02	2.14	4.01
$j \ge 5$	0.10	0.18	-0.53	3.26	3.92	6.67	13.61
Real GDP Growth ^{\ddagger}							
all maturities net fc	-0.32	-0.22	-0.40	-2.53	-0.93	-11.40	-15.81
$j \leqslant 1$	-0.01	-0.01	-0.14	-0.66	-0.23	-1.76	-2.81
$2\leqslant j\leqslant 4$	-0.02	-0.04	-0.20	-1.26	-0.65	-3.11	-5.27
$j \ge 5$	-0.30	-0.18	-0.75	-3.41	-1.06	-5.03	-10.72
foreign credits	—	—	0.69	2.79	1.01	-1.50	2.98
Inflation [‡]							
all maturities net fc	-0.12	-0.42	-1.24	-0.53	0.95	-2.14	-3.49
$j \leqslant 1$	-0.00	-0.01	-0.27	-0.11	0.32	-0.01	-0.08
$2 \leqslant j \leqslant 4$	-0.01	-0.05	-0.42	-0.07	0.36	-0.57	-0.77
$j \ge 5$	-0.11	-0.36	-1.81	-0.54	1.60	0.03	-1.18
foreign credits	_	_	1.26	0.19	-1.32	-1.58	-1.46
Primary Deficit	-0.19	0.97	26.22	-4.17	-10.13	19.73	32.42
Foreign Payouts	_	_	-12.78	-1.20	4.99	14.04	5.05
Federal Reserve Credit	_	-0.12	-4.25	2.69	-0.66	-1.84	-4.18
Payments to Fed	—	_	-0.04	-0.68	-0.37	-0.33	-1.43
Cross Term	0.01	-0.03	1.90	0.47	0.10	0.08	2.52
Residual	-0.06	-0.85	1.71	1.09	-1.54	-0.13	0.21

Table 5: Contributions to Changes in the Debt-net-Foreign-Credits to GDP Ratio

Note: All contributions are shares of GDP.

[†] Treasury debt is its end-of-year market value net of foreign credits, holdings of the Federal Reserve and government accounts, and the balance in the Treasury.

‡ Treasury debt is decomposed into three groups: claims maturing within one year, $j \le 1$; claims maturing between two and four years, $2 \le j \le 4$; claims maturing in five years or more, $j \ge 5$.

11 Epilogue: more complications

Section 5 described how in 1933 President Roosevelt followed Irving Fisher's advice by adopting policies designed to redistribute wealth from creditors to debtors by increasing the price level. The Roosevelt administration's efforts in that direction were dwarfed by fiscal-monetary policies that more than a decade earlier had created the German hyperin-flation of 1921-1923.⁶⁵ Germany had financed only a small fraction of WWI by borrowing from foreigners; instead, a substantial fraction was financed by Germans who purchased German government securities. By ultimately increasing the price level in November 1923 to approximately twelve orders of magnitude of the 1913 price level (i.e., 10¹² in scientific notation), the German fiscal-monetary authorities defaulted on virtually all of its domestic debt.⁶⁶

But the Versailles Treaty in June 1919 and the London Schedule of Payments in April 1921 imposed foreign debts on Germany in the form of uncertain and large reparations payments due in gold to the victors of the War, especially France and the UK. As part of these reparations, Germany was required to pay the Allies a fixed annuity of 2,000 million gold Marks (\$476 million), roughly the same amount the Allies were scheduled to the United States.⁶⁷ While Germany was not required to make reparation payments directly to the US, Germany was required to reimburse the expenses of the American army of occupation and the pay of a set of private claims of American citizens. The German hyperinflation of 1922-23 was an outcome of efforts by reparations creditors, especially France, to force Germany to tax its citizens and suppress its government expenditures to make enough "fiscal space" for Germany to service its reparations obligations. France threatened to occupy the Ruhr valley and seize factories and mines unless Germany paid reparations payments due in 1922. Germany did not pay. In January 1923, France carried out its threat by invading the Ruhr and then operating Ruhr factories and mines. The German government responded with a "passive resistance" in which it printed German marks to pay German workers not to work for the French. By the fall of 1923, printing presses were financing over 95% of the Weimar Republic's federal expenditures.

⁶⁵For descriptions and accounts of the German hyperinflation, see Sargent (1982) and Taylor (2013). See Schuker (1988) for a description of President Roosevelt's ambivalent attitude about protecting the interests of American creditors in Germany.

⁶⁶A concomitant effect was a huge redistribution from German domestic private creditors to German domestic private debtors.

 $^{^{67}\}mathrm{In}$ April 1921, the Allies owed the US 9.4 billion in principal, with annual interest payments of 470 million.

The German hyperinflation ended with a bargain among German government authorities, German reparations creditors, the Reparations commission, and US bankers and government officials that rescheduled German reparations obligations, rearranged German monetary-fiscal institutions and policies in ways designed to protect central bank independence, and brokered an international loan to the German federal government. The Dawes Plan organized a substantial 1924 Reparation Loan to the Reich.⁶⁸ Under the terms of the Dawes loan, offered by a consortium of banks led by J.P. Morgan & Co, the German Republic borrowed \$200 million from private lenders for 25 years at 7%; \$110,000,000 or roughly half of the total was sold to US investors. Along with this loan, the Dawes Plan rescheduled reparation payments and reduced them in the short term. The plan placed the Reichsbank under international supervision and German fiscal affairs under the supervision of an Agent General for Reparations of the Allied Reparations Commission.

For five or six years, the Dawes plan succeeded in easing Germany's financial distress and converting Germany into an attractive location for foreign investment, particularly from American savers. From 1924 to 1930, Germany became the largest European recipient of American private lending; and the US became Germany's largest creditor, with the US holding over 40% of all German external loans.⁶⁹ From 1924 to 1930 American investment banks publicly offered 135 dollar denominated bonds issued by German government entities and dozens of privately-offered loans for an aggregate par value exceeding \$1.2 billion. Figure 30 plots as a blue line the implied quantity outstanding for the 148 bonds listed in Kuczynski (1927, 1932). By June 1931, US banks held \$500 million in short-term loans owed by Germans, comprising half of all US bank lending to Europe.⁷⁰ Additional short-term credits, primarily in the form of commercial credits by American firms, brought the total quantity of German debt to US private creditors to over \$2,000 million by 1931.

US lenders extended loans to German public and private entities. For 135 publicly offered and 13 privately offered loans listed in Kuczynski (1927, 1932), table 6 divides German borrowers into eight sectors and reports the distribution of loans among them. The only loans to the German Republic (i.e., the federal government) were the Dawes Loan of 1924 and the Young Loan of 1930. Most foreign lending to Germany instead went

⁶⁸In 1919 and 1920, there had been substantial transfers to Germany by residents of the UK, US, and other countries speculating on a recovery of the German mark. John Maynard Keynes was among them. Some estimates of the funds transferred to Germany by the failures of those investments are as large as \$3.5 billion. See Taylor (2013, ch. 14, Boom).

 $^{^{69}}$ See Table 2 Klug (1993, p. 6).

⁷⁰See Board of Governors of the Federal Reserve System (1943, p. 585).

to Germany's states, provinces, cities, and industrial firms. Reparations payments were the responsibility of the German Republic. The German Republic encouraged commercial borrowing: after all, if default loomed, the Weimar government could argue that nonreparations public and commercial debts should be paid before reparations. German fiscal authorities hoped to align US *private* creditors' interests with theirs and thereby drive a wedge between the interests of US private creditors and reparations creditors. It was not polite to say things like this in public, but German Foreign Minister Gustav Stresemann did. In 1925, he remarked: "One must simply have enough debts; one must have so many debts that, if the debtor collapses, the creditor sees his own existence jeopardized."⁷¹ Of course, that would pit the interests of American private creditors against those of owners of US Treasury debt who had expected the US Treasury's debt to be backed by its holdings of foreign credits to former WWI allies, which in turn were ultimately backed by German reparations payments.

American isolationists and populists asserted that American advocates of "cancellationist" measures wanted to protect the interests of international bankers and European reparations creditors at the expense of American taxpayers. The *New York American* criticized "the campaign of international bankers to squeeze, cajole, wheedle Uncle Sam into cancelling the thousands of millions of dollars owed the United States Treasury by European nations" and warned its readers that "international bankers, to protect their own private investments overseas, want the U.S. to cancel the foreign war debts."⁷²

Were those accusations justified? Not entirely. First, the \$2 billion that German borrowers owed US investors was a small fraction of the \$12 billion the Allies owed to the US Treasury. Second, American creditors to Germany were also US taxpayers. We have incomplete information about the identities of American creditors, but we do know that most German bonds sold to Americans were issued in small denominations. For example, the Dawes Reparation Loan – officially named the German External Loan, 7% Bonds of October 1924 – consisted of bonds in denominations of \$1000, \$500, and \$100, indicating that these bonds were sold to small investors. Using records from 24 American Bond Houses, J.P. Morgan & Co. partner Dwight W. Morrow (1927) estimated that 91% of buyers of Dawes loan bonds purchased less than \$5,000 worth and that these small buyers purchased 53.6% of the total offering. Further, in the 1950s, the commission that settled claims of

 $^{^{71} {\}rm See}$ Tooze (2014, p. 465).

⁷²September 15, 1932. The *New York American* was a Hearst newspaper with masthead slogans "America First" and "An American paper for the American people".

	Number of	Dollar Amount	Percent
Borrower	Loans	Offered in US	of Total
German Republic	2	\$208,250,000	16
States	16	$144,\!375,\!000$	11
Provinces, Counties and Municipalities	19	$101,\!420,\!000$	8
Public Utilities	40	$257,\!548,\!000$	20
Industrial Corporations	35	$246,\!968,\!500$	19
Credit and Saving Institutions	22	$263,\!500,\!000$	20
Other	10	$64,\!515,\!000$	5
Religious and Welfare Organization	4	13,000,000	1
Total	148	\$1,299,576,500	

Table 6: Distribution by Sector of German Bonds Issued in the United States: 1924-1932 Note: This table reports the par value of the loans listed by Kuczynski (1927, 1932) decomposed by sector. Since some of the principal was repaid, this is does represent the total outstanding.

American owners of German dollar-denominated bonds processed 40,620 separate claims.⁷³ This evidence suggests that many retail purchasers of these bonds were individuals rather than banks and other financial firms.

11.0.1 Credits recognized to be subsidies

During the late 1920s, the Federal Reserve raised interest rates in attempts to rein in sharp rises in US stock prices. Higher US interest rates increased the attractiveness of investing in US bonds while also making it more costly for heavily indebted countries like Germany to service their debts to the US. So US foreign lending declined sharply soon thereafter and international capital flows slowed to a trickle. Germany and several South American countries defaulted. There occurred a global financial crisis.

On June 20, 1931, President Hoover proposed a temporary debt moratorium that applied to war credits as well as reparations, but it did not go into effect until the winter when Congress approved it. In December 1932, when the temporary moratorium expired, reparations stopped. Germany stopped making payments on the Dawes and Young loans, though these bonds continued to be traded on US markets well into World War II, albeit

⁷³See Hartman and Skaupy (1957, p. 448).

at deep discounts.^{74,75} See figure 31. France repudiated its WWI credits due to the US, but the UK did not, so negotiations with the UK continued although UK payments to the US had stopped. The US continued to seek compensation for its World War I credits to allies, but only Finland continued to make its full scheduled payments after the moratorium.⁷⁶

After all this, between 1918 and 1940, in exchange for the over \$12 billion in loans, credits, and accrued interest on the US Treasury's books, the Treasury received \$2.86 billion in remittances (\$2.11 billion labeled interest and \$777 million labeled principal) from the Allies. The U.K. made \$2.19 billion in payments (\$464 million in principal and \$1.72 million in interest) on the \$4.7 billion the UK government owed the US Treasury, while France paid only \$486 million (\$226 in principal and \$260 million in interest) on the \$4.2 billion that the government of France owed the US Treasury.

⁷⁴Meanwhile, through a clever German government program designed by Reichsbank President Hjalmar Horace Greeley Schacht, German firms purchased roughly 1/3 of Germany's dollar-denominated debts at heavily discounted prices between 1932 and 1940. These transactions are recorded in German Registration Office for Foreign Debt (1932-1940) and discussed in Klug (1993) and Tooze (2006, ch. 3).

⁷⁵After World War II, Germany resumed payments on these bonds. At the London Debt Conference of 1953, principals of the American tranches of the Dawes and Young loans were refinanced at 5.5% and 5.0%, respectively, with their maturity dates being extended to 1969 and 1980, respectively. Interest in arrears was refinanced into 20 year bonds paying 3%. See United Nations (1959, Annex I, p. 96). Holders of outstanding German commercial and municipal debts covered by the agreement had their claims written down to 38% of their 1931 level. See Klug (1993, p. 54) and Guinnane (2004).

⁷⁶In the second half of 1933, Czechoslovakia, Great Britain, Greece, Italy, Latvia and Lithuania made partial payments.

With the exception of a postponement in 1941 and 1942, Finland continued to meet its scheduled obligations – even in 1943 and 1944 when it was allied with Germany. After 1949, the US Treasury dedicated Finland's debt payments to finance educational exchanges between the US and Finland. Finland made its final payment in 1977.

Greece made partial payments on its debt until 1942. Then in 1964 Greece agreed to an 80 year repayment schedule at 2 percent interest. Greece remains current on this loan. Its last installment is due on November 17, 2048.

Hungary also made partial payments during the 1930s and early 1940s. In 1977, it paid the US Treasury over \$4 million to become current on its obligations. Hungary repaid its debt in full in the early 1980s. The final payments were used to finance cultural exchanges between the two countries.

Together the debts of Finland, Greece, and Hungary were less than 4/10 of 1 percent of the total indebtedness of foreign governments to the United States arising from World War I.



Figure 30: Various Estimates of Private US Lending to Germany

Note: The blue line, labeled "bonds outstanding," reports the par value outstanding for 135 publicly-placed and 13 privately-placed dollar-denominated bonds issued in the US and listed in Kuczynski (1927, 1932). For this set of bonds, the quantity outstanding on December 31, 1930 is \$1,047 million. However, data from other sources suggest that we have an incomplete list of privately placed bonds; further, we are missing secondary market purchases of German bonds placed in foreign countries.

The series "long-term debt" (red line) and "long-term+short term" (green line) are computed from Table 5: *German External Debt, Excluding Reparations* of Klug (1993). We assume that US shares of German external short-term debt and long-term debt remain fixed at 31.8% and 49.3%, respectively. We convert RM into dollars at the rate 0.2382 \$/RM.

The \bigcirc reports quantity outstanding of long-term portfolio investments (\$1,117 million) in December 1930. The \triangle reports the sum of long-term portfolio and direct investments outstanding (\$1,361 million) in December 1930. Both figures are from Table 1 of Klug (1993). See also Dickens (1931, Table 4); Dickens reports that for December 1930 the quantity outstanding of long-term portfolio investments is \$1,177 million and the sum of long-term portfolio and direct investments outstanding is \$1,421 million.

The * reports US long-term credits outstanding (\$1,230 million) in May 1932. The × reports the sum of long-term and short-term credits outstanding (\$2,000 million) in May 1932. Both of these figures are reported in Table 2 of Klug (1993).

The \diamond is the quantity outstanding of German bonds issued in the United States, June 1932 (\$1,327 million) reported in Table 2 of Klug (1993).



Figure 31: US Prices of the Dawes and Young Loans

A Accounting Framework

This appendix compares accounting systems used by the US Treasury and macroeconomic theory.

A.1 Government budget constraint

We want to represent the government budget constraint as it appears in macroeconomic models. Let $B_{t-1} = \sum_{j=1}^{n} B_{t-1}^{j}$ be the total nominal value of interest bearing government debt at t-1, where B_{t-1}^{j} is the nominal value of zero coupon bonds of maturity j at t-1. Let $r_{t-1,t}^{j}$ be the net nominal return between t-1 and t on nominal zero-coupon bonds of maturity j. The government budget constraint at time t is

$$B_t = r_{t-1,t}B_{t-1} + B_{t-1} + (G_t - T_t) - (M_t - M_{t-1})$$
(2)

or

$$B_t = \sum_{j=1}^n r_{t-1,t}^j B_{t-1}^j + B_{t-1} + (G_t - T_t) - (M_t - M_{t-1}),$$
(3)

where G_t is the dollar value of government purchases, T_t is the dollar value of taxes net of transfers, M_t is the stock of non-interest bearing government debt called base money, and the equality

$$\sum_{j=1}^{n} r_{t-1,t}^{j} B_{t-1}^{j} = r_{t-1,t} \sum_{j=1}^{n} B_{t-1}^{j}$$
(4)

implicitly defines the value-weighted net nominal return $r_{t-1,t}$ on interest-bearing nominal government bonds from t-1 to t. In section A.4 we modify (2) to account for foreign credits.

Let Y_t be real GDP at t, p_t be the price level, $v_t = p_t^{-1}$ be the real value of a dollar, and $v_t B_t$ be the real value of interest bearing government debt to the public. The government budget constraint (2) or (3) and simple algebra tell how a net nominal return $r_{t-1,t}$, a net inflation rate $\pi_{t-1,t}$, a net growth rate in real GDP $g_{t-1,t}$, a net rate of increase in base money $\mu_{t-1,t}$, and a real primary deficit def_t = $v_t(G_t - T_t)$ contribute to the evolution of the government interest bearing debt-GDP ratio:

$$\frac{v_t B_t}{Y_t} = (r_{t-1,t} - \pi_{t-1,t} - g_{t-1,t}) \frac{v_{t-1} B_{t-1}}{Y_{t-1}} + \frac{\det_t}{Y_t} + \frac{v_{t-1} B_{t-1}}{Y_{t-1}} - (\mu_{t-1,t} - \pi_{t-1,t} - g_{t-1,t}) \frac{M_{t-1}}{Y_{t-1} p_{t-1}}.$$
(5)

To bring out consequences of interest rate risk and the maturity structure of the debt for the evolution of the debt-GDP ratio, we refine equation (5) to recognize that the government pays different nominal one-period returns on the dollar denominated IOUs of different maturities that comprise B_t :

$$\frac{v_t B_t}{Y_t} = \sum_{j=1}^n r_{t-1,t}^j \frac{v_{t-1} B_{t-1}^j}{Y_{t-1}} - (\pi_{t-1,t} + g_{t-1,t}) \frac{v_{t-1} B_{t-1}}{Y_{t-1}} + \frac{v_{t-1} B_{t-1}}{Y_{t-1}} + \frac{\det_t}{Y_t} - (\mu_{t-1,t} - \pi_{t-1,t} - g_{t-1,t}) \frac{M_{t-1}}{Y_{t-1} p_{t-1}}$$
(6)

Equation (6) distinguishes contributions to the growth of the debt-GDP ratio that depend on debt maturity j from those that don't: $\pi_{t-1,t}$ and $g_{t-1,t}$ don't depend on j and operate on the *total* real value of debt last period; but the nominal returns $r_{t-1,t}^{j}$ depend on maturity j and operate on the real values of the corresponding maturity j components B_{t-1}^{j} .

A.2 US government accounts

The Treasury measures government debt and interest payments differently than do macroeconomists. The official accounts measure government debt by the total par value of outstanding promises, while the macroeconomist's budget constraint is cast in terms of market values.

To understand how the Treasury's measure of government debt is related to the market value of debt, we bring in information about bonds' coupons, principals or par values, and prices of (presumably risk-free) promises to future dollars. In the tradition of macro finance, we use Hicks-Arrow prices of future-dated claims. Let time be discrete so that $t \in \{0, \pm 1, \pm 2, \ldots\}$. Let the market price q_{t+j}^t be the number of dollars at time t that buys a risk-free claim to a dollar at time t + j. The superscript t denotes the date at which the price is quoted, while the subscript t + j refers to the date at which a promise to pay is to be fulfilled. At any date t, let there be a list of market prices $\{q_{t+j}^t\}_{j=0}^{n_t}$, where n_t is the maximum horizon over which the government has promised payments.⁷⁷ (Hall et al. (2020) describe how they inferred the Hicks-Arrow prices that we use from a collection of bond prices and associated promised payment streams.⁷⁸) We set $q_t^t = 1$ to express that a dollar

⁷⁷When the government has issued perpetual consols, $n_t = \infty$.

⁷⁸Hall et al. (2020) computed nonlinear least squares coefficients $\hat{\alpha}_{i,t}$ in the "level-slopecurvature" approximation $q_{t+j}^t \approx \exp\left(-(\alpha_{0,t} + \alpha_{1,t}j + \alpha_{2,t}j^2)j\right)$, then approximated q_{t+j}^t by $\exp\left(-(\hat{\alpha}_{0,t} + \hat{\alpha}_{1,t}j + \hat{\alpha}_{2,t}j^2)j\right)$.

today costs one dollar today.⁷⁹ For $j \ge 1$, the price q_{t+j}^t is related to the yield to maturity ρ_{jt} for *j*-period risk-free zero-coupon bonds by

$$q_{t+j}^t = \frac{1}{(1+\rho_{jt})^j}.$$

The gross nominal return on a *j*-period zero coupon bond from time t to t + 1 is

$$\frac{q_{t+j-1}^{t+1}}{q_{t+j}^t} = (1 + r_{t,t+1}^j)$$

where $r_{t,t+1}^{j}$ is the net nominal return. The net return equals the yield only for j = 1.

At time t the government promises to pay s_{t+j}^t dollars at times $t+j, j = 1, 2, \ldots, n_t$. We interpret s_t^t as currency or base money.⁸⁰ For $j \ge 1$, promised payments consist of coupons c_{t+j}^t and terminal or principal payments (also known as par values) b_{t+j}^t :

$$s_{t+j}^t \equiv c_{t+j}^t + b_{t+j}^t. \tag{7}$$

These are sums over all outstanding bonds of coupon and principal components associated with each bond. The market value of interest bearing government debt at time t is

$$\sum_{j=1}^{n_t} q_{t+j}^t s_{t+j}^t, \tag{8}$$

which states that the total value of government debt is the sum of a collection of prices times quantities.⁸¹

The Treasury defines government debt at time t as the sum of par values of outstanding

⁸⁰We assume that $\begin{pmatrix} q_{t+j-1}^t \\ q_{t+j-1}^t \end{pmatrix} = 1$ for j = 0 so that $r_{t-1,t}^0 = 0$. ⁸¹In situations in which the payout stream is uncertain, a possible pricing theory is instead

$$\sum_{j=1}^{n_t} q_{t+j}^t \tilde{s}_{t+j}^t \tilde{\pi}_{t+j}^t, \tag{9}$$

where $\{\tilde{s}_{t+j}^t\}$ is a promised payout stream and $\{\tilde{\pi}_{t+j}^t\}$ is a sequence of fractions of promised payouts that a representative risk-neutral investor expects will actually be paid.

⁷⁹We also assume that $q_{t-j}^t = 1$ for $j \ge 1$ to express that a claim to a dollar does not expire at its maturity date.

debt

$$\sum_{j=1}^{n_t} b_{t+j}^t,$$
(10)

which differs from the market value of government debt

$$\sum_{j=1}^{n_t} q_{t+j}^t s_{t+j}^t = \sum_{j=1}^{n_t} q_{t+j}^t (c_{t+j}^t + b_{t+j}^t)$$

for two reasons:

• It neglects promises to pay coupons

$$\sum_{j=1}^{n_t} c_{t+j}^t$$

and

• The book value given by equation (10) fails to multiply future principal payments of b_{t+j}^t by multiplying them by market prices q_{t+j}^t .

The first omission causes the official Treasury concept (10) to understate the market value of debt, while the second omission makes it overstate it. This means that the official measure of government debt $\sum_{j=1}^{n_t} b_{t+j}^t$ can either exceed or fall short of the market value $\sum_{j=1}^{n_t} q_{t+j}^t s_{t+j}^t$.

We can represent the macroeconomist's budget constraint (2) or (3) as^{82}

$$\sum_{j=0}^{n_t} q_{t+j}^t s_{t+j}^t = \sum_{j=0}^{n_{t-1}} q_{t+j-1}^t s_{t+j-1}^{t-1} + (G_t - T_t),$$
(11)

The left side of (11) is the value of government debt in period t, while the first term on the right side is the value of payments that the government had promised at time t - 1evaluated at time time t prices q_{t+j}^t . Equation (11) states that the value of the government debt changes between times t and t + 1 because

1. Prices of time t + j promises s_{t+j}^{t-1} to time t + j dollars change from q_{t+j}^{t-1} to q_{t+j}^{t} .

 $[\]frac{^{82}\text{To recognize that budget constraint (12) is equivalent with (6), use the definitions and approximation}{q_{t+j-1}^{t-1}s_{t+j-1}^{t-1} = B_{t-1}^{j}, B_{t-1} = \sum_{j=1}^{n} B_{t-1}^{j}, M_{t} = s_{t}^{t}, \left(\frac{v_{t}}{v_{t-1}}\frac{q_{t+j-1}^{t}}{q_{t+j-1}^{t-1}}\frac{Y_{t-1}}{Y_{t}} - 1\right) \approx r_{t-1,t}^{j} - \pi_{t-1,t} - g_{t-1,t} .$

- 2. The government pays off or reschedules some components of its promised payments, contributing to deviations of s_{t+j}^t from s_{t+j}^{t-1} for some j's.
- 3. The government runs a net-of-interest nominal deficit or surplus at date t.

It is enlightening to rewrite equation (11) as

$$\sum_{j=0}^{n_t} q_{t+j}^t s_{t+j}^t = \sum_{\substack{j=0\\j=0}}^{n_{t-1}} \left(\frac{q_{t+j-1}^t}{q_{t+j-1}^{t-1}} \right) q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} + (G_t - T_t) = \sum_{j=0}^{n_{t-1}} q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} + \sum_{j=1}^{n_{t-1}} r_{t-1,t}^j q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} + (G_t - T_t).$$
(12)

The second term on the right side of the second line of equation (12) measures time t nominal net returns on the time t - 1 nominal government debt:

$$\sum_{j=1}^{n_{t-1}} r_{t-1,t}^j q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} \tag{13}$$

So equation (12) expresses the nominal value of government debt in period t as the sum of the value of government debt yesterday, net nominal returns on last period's debt, and the government deficit $G_t - T_t$.

A.3 Interest reported by the Treasury

The net nominal interest payments defined in expression (13) are not what the US Treasury reports. Instead, it reports a different notion of interest, namely:

1. Before 1929:

 c_t^{t-1}

2. After 1929:

$$c_t^{t-1} + r_{t-1,t}^1 b_{1,t}^{t-1} \tag{14}$$

where $b_{1,t}^{t-1}$ is the par value of pure discount one-period treasury bills issued at t-1. So what the Treasury reports as interest consists of coupons on longer maturity bonds plus the net yield on one-period zero-coupon Treasury bills (these have existed only since 1929). To relate the government's post-1929 definition of nominal interest payments to the theoretical concepts in a standard macroeconomic formulation like (11), we first introduce the decomposition $b_t^{t-1} = b_{1,t}^{t-1} + b_{-1,t}^{t-1}$ where $b_{-1,t}^{t-1}$ is the par (or principal) value of bonds with initial maturities exceeding one period that fall due at time t. (Here we follow game theorists in using the subscript -1 to mean "not 1", which in the present context means "not a treasury bill.") We use this decomposition to accommodate how the US Treasury accounts for interest on Treasury bills. Then note that $q_t^t = 1$ and rewrite the standard macroeconomic government budget constraint (12) as

$$\sum_{j=1}^{n_t} q_{t+j}^t s_{t+j}^t = c_t^{t-1} + b_t^{t-1} + \sum_{j=2}^{n_{t-1}} \left(\frac{q_{t+j-1}^t}{q_{t+j-1}^{t-1}} \right) q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} + (G_t - T_t)$$
$$= c_t^{t-1} + b_{1,t}^{t-1} + b_{-1,t}^{t-1} + \sum_{j=2}^{n_{t-1}} (1 + r_{t-1,t}^j) q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} + (G_t - T_t).$$
(15)

The second and third terms on the second line of the right side of equation (15) decompose principal payments into those attributable to maturing one-period pure discount bonds $b_{1,t}^{t-1}$ and to maturing longer term bonds $b_{-1,t}^{t-1}$. Rewrite the right side of equation (15) as $\sum_{j=2}^{n_{t-1}} q_{t+j-1}^{t-1} s_{t+j-1}^{t-1} + (G_t - T_t)$ plus



The first term is what the Treasury records as interest payments. The second term constitutes repayments of principal at time t. We can interpret the sum of the first and second terms of the above sum as expressing cash that the Treasury must have at time t in order to "service" its debt, meaning to pay coupons plus principal due at time t.⁸³ The third term measures capital gains or losses on longer term government debt held from t-1 to t. These capital gains are included in the macroeconomic concept of interest on the government debt but are neglected in the official concept.

 $^{^{83}}$ Tables 1.5 and 1.7 of IMF (2014) report what the IMF calls Gross Financing Needs of all member countries for the coming years. This is the sum of our first and third terms.

A.4 Foreign credits and Federal Reserve lending

The value of the promised stream of payments from foreign governments to the US Treasury, $\{y_{t+i}^t\}$, at time t is

$$C_t = \sum_{j=0}^{m_t} q_{t+j}^t y_{t+j}^t,$$
(16)

where q_{t+j}^t is the time t Hicks-Arrow price of a risk-free claim to one dollar at time t + j, and m_t is the maximum horizon over which the Treasury is promised payments at time t.⁸⁴ The promised payment stream, $\{y_{t+j}^t\}$, depends on the history of foreign credits extended at times t and earlier in a way that we now describe.

For convenience and without loss of generality, set $m_t = +\infty$ for all t. Let f_t be the one-period net payout from the portfolio of credits C_{t-1} from t-1 to t, including the time t coupon or repayment and capital gains or losses from revaluations and reschedulings:

$$f_t = y_t^t + \sum_{j=1}^{\infty} q_{t+j}^t y_{t+j}^t - \sum_{j=1}^{\infty} q_{t+j}^{t-1} y_{t+j}^{t-1}$$

Adding and subtracting $\sum_{j=1}^{\infty} q_{t+j}^t y_{t+j}^{t-1}$ to the right side of the above equation gives

$$f_t = y_t^t + \sum_{j=1}^{\infty} q_{t+j}^t (y_{t+j}^t - y_{t+j}^{t-1}) + \sum_{j=1}^{\infty} (q_{t+j}^t - q_{t+j}^{t-1}) y_{t+j}^{t-1}.$$
 (17)

The first term in formula (17) for f_t is the time t payoff. The second term is the gain from restructuring the payment schedule between t - 1 and t. The third term is the capital gain on the time t - 1 promised payment stream due to the change in Hicks-Arrow prices between t - 1 and t. The initial condition for foreign credits is

$$f_0 = -\sum_{j=1}^{\infty} q_j^0 y_j^0, \tag{18}$$

which states that at time t = 0 the US government lends $-f_0$ to foreign governments in

$$q_{t+j}^t = \frac{1}{(1+\rho_{n_t t})^j} \text{ for } n_t < j \leqslant m_t$$

where $\rho_{n_t t}$ is the yield to maturity of a n_t -period risk-free zero-coupon bond.

⁸⁴When the horizon of the promised stream of foreign payments exceeds the horizon of our Hicks-Arrow prices (i.e., when $m_t > n_t$), we extrapolate our Hicks-Arrow prices by setting

exchange for a promised repayment stream $\{y_j^0\}_{j=1}^{\infty}$ from foreign governments to the US.

To account for the interest payments on the Federal Reserve's loans to the public for the purpose of purchasing Treasury securities, we let d_t denote the end-of-period discount rate on these loans and let M_t denote the high powered money secured by collateral in the form of Treasury securities at end of period t. Thus, when the Treasury owns foreign credits and the Federal Reserve extends credit to the public, we modify (2) to be

$$(B_t - C_t) = r_{t-1,t}B_{t-1} - f_t + (B_{t-1} - C_{t-1}) + (G_t - T_t) - (M_t - M_{t-1}) - d_{t-1}M_{t-1}.$$
 (19)

Equation (19) indicates how lower income from government foreign credits increases the amount that the Treasury must finance.

In the government accounts, the extension of foreign credits is included in government spending. Thus, if in period t, the government borrows \$1 and lends it to a foreign government, G_t , f_t , B_t , and C_t each increase by \$1.

B Secretary Bryan's letter to President Wilson

I beg to communicate to you an important matter which has come before the Department. Morgan Company of New York have asked whether there would be any objection to their making a loan to the French Government and also the Rothschilds – I suppose that is intended for the French Government. I have conferred with Mr. Lansing and he knows of no legal objection to financing this loan, but I have suggested to him the advisability of presenting to you an aspect of the case which is not legal but I believe to be consistent with our attitude in international matters. It is whether it would be advisable for this Government to take the position that it will not approve of any loan to a belligerent nation. The reasons that I would give in support of this proposition are:

First: Money is the worst of all contrabands because it commands everything else. The question of making loans contraband by international agreement has been discussed, but no action has been taken. I know of nothing that would do more to prevent war than an international agreement that neutral nations would not loan to belligerents. While such an agreement would be of great advantage, could we not by our example hasten the reaching of such an agreement? We are the one great nation which is not involved, and our refusal to loan to any belligerent would naturally tend to hasten a conclusion of the war. We are responsible for the use of our influence through example, and as we cannot tell what we can do until we try, the only way of testing our influence is to set the example and observe its effect. This is the fundamental reason in support of the suggestion submitted.

Second: There is a special and local reason, it seems to me, why this course would be advisable. Mr. Lansing observed in the discussion of the subject that a loan would be taken by those in sympathy with the country in whose behalf the loan was negotiated. If we approved of a loan to France we could not, of course, object to a loan to Great Britain, Germany, Russia, or to any other country, and if loans were made to these countries, our citizens would be divided into groups, each group loaning money to the country which it favors and this money could not be furnished without expressions of sympathy. These expressions of sympathy are disturbing enough when they do not rest upon pecuniary interests – they would be still more disturbing if each group was pecuniarily interested in the success of the nation to whom its members had loaned money.

Third: The powerful financial interests which would be connected with these loans would be tempted to use their influence through the newspapers to support the interests of the Government to which they had loaned because the value of the security would be directly affected by the result of the war. We would thus find our newspapers violently arrayed on one side or the other, each paper supporting a financial group and pecuniary interest. All of this influence would make it all the more difficult for us to maintain neutrality as our action on various questions that would arise would affect one side or the other and powerful financial interests would be thrown into the balance.... As we cannot prevent American citizens going abroad at their own risk, so we cannot prevent dollars going abroad at the risk of the owners, but the influence of the Government is used to prevent American citizens from doing this. Would the nation's dollars in a foreign war?

Secretary of State William Jennings Bryan to President Woodrow Wilson, August 10, 1914

C US Treasury Credits: Original Principal and Present Value of Refinanced of Promised Payments

				Debt prior to	o Present value of refinanced promised payments and					
Country	Original	Funded	Funded	funding including	present value as a percent of principal prior to refunding					
	Principal	Interest	Debt	accrued interest	3 per cer	3 per cent		$4\frac{1}{4}$ per cent		ıt
Belgium	\$377,029,570	\$40,750,430	\$417,780,000	\$483,426,000	\$302,239,000	62.5%	\$225,000,000	46.5%	\$191,726,000	39.7%
Czechoslovakia	91,879,671	23,120,329	115,000,000	123,854,000	124,995,000	100.9	91,964,000	74.3	77,985,000	63.0
Estonia	12,066,222	1,763,778	13,830,000	14,143,000	14,798,000	104.6	11,392,000	80.5	9,915,000	70.1
Finland	8,281,926	718,074	9,000,000	9,190,000	9,630,000	104.8	7,413,000	80.7	6,452,000	70.2
France	3,340,516,044	684, 483, 956	4,025,000,000	4,230,777,000	2,734,250,000	64.6	1,996,509,000	47.2	1,681,369,000	39.7
Great Britain	4,074,818,358	525,181,642	4,175,310,000	4,715,310,000	4,922,702,000	104.4	3,788,470,000	80.3	3,296,948,000	69.9
Hungary	1,685,836	253,164	1,984,000	1,984,000	2,076,000	104.6	1,596,000	80.4	1,388,000	70.0
Italy	1,647,869,198	394,130,802	2,150,150,000	2,150,150,000	782,321,000	36.4	528,192,600	24.6	426,287,000	19.8
Latvia	5,132,287	642,713	5,893,000	5,893,000	6,181,000	104.9	4,755,000	80.7	4,137,000	70.2
Lithuania	4,981,628	1,048,372	6,216,000	6,216,000	$6,\!452,\!000$	103.8	4,967,000	79.9	4,322,000	69.5
Poland	159,666,972	18,893,028	182,324,000	182,324,000	191,283,000	104.9	146,825,000	80.5	127,643,000	70.0
Romania	36,128,495	8,461,505	46,945,000	46,945,000	48,442,000	103.2	35,172,000	74.9	29,507,000	62.9
Yugoslavia	51,037,886	11,812,114	66,164,000	66,164,000	30,286,000	45.8	20,030,000	30.3	$15,\!919,\!000$	24.1
Total	\$9,811,094,094	\$1,711,259,906	\$11,522,354,000	\$12,036,376,000	\$9,175655,000	76.2%	\$6,862,285,000	57.0%	\$5,873,638,000	48.8%

Source: Page 443 of United States World War Foreign Debt Commission (1927).

D Franklin D. Roosevelt's "bombshell message"

I would regard it as a catastrophe amounting to a world tragedy if the great Conference of Nations, called to bring about a more real and permanent financial stability and a greater prosperity to the masses of all Nations, should, in advance of any serious effort to consider these broader problems, allow itself to be diverted by the proposal of a purely artificial and temporary experiment affecting the monetary exchange of a few Nations only. Such action, such diversion, shows a singular lack of proportion and a failure to remember the larger purposes for which the Economic Conference originally was called together.

I do not relish the thought that insistence on such action should be made an excuse for the continuance of the basic economic errors that underlie so much of the present world-wide depression.

The world will not long be lulled by the specious fallacy of achieving a temporary and probably an artificial stability in foreign exchange on the part of a few large countries only.

The sound internal economic system of a Nation is a greater factor in its wellbeing than the price of its currency in changing terms of the currencies of other Nations.

It is for this reason that reduced cost of Government, adequate Government income, and ability to service Government debts are all so important to ultimate stability. So too, old fetishes of so-called international bankers are being replaced by efforts to plan national currencies with the objective of giving to those currencies a continuing purchasing power which does not greatly vary in terms of the commodities and need of modern civilization. Let me be frank in saying that the United States seeks the kind of dollar which a generation hence will have the same purchasing and debt-paying power as the dollar value we hope to attain in the near future. That objective means more to the good of other Nations than a fixed ratio for a month or two in terms of the pound or franc.

Our broad purpose is the permanent stabilization of every Nation's currency. Gold or gold and silver can well continue to be a metallic reserve behind currencies, but this is not the time to dissipate gold reserves. When the world works out concerted policies in the majority of Nations to produce balanced budgets and living within their means, then we can properly discuss a better distribution of the world's gold and silver supply to act as a reserve base of national currencies. Restoration of world trade is an important factor, both in the means and in the result. Here also temporary exchange fixing is not the true answer. We must rather mitigate existing embargoes to make easier the exchange of products which one Nation has and the other Nation has not.

The Conference was called to better and perhaps to cure fundamental economic ills. It must not be diverted from that effort.

Wireless to the London Conference, July 3, 1933

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