

# WHY THE U.S. TREASURY BEGAN AUCTIONING TREASURY BILLS IN 1929

- In the 1920s, there were several flaws in the structure of U.S. Treasury financing operations.
- The flaws were attributable to the war-time practice of selling securities in fixed-price subscription offerings and the newer practice of limiting Treasury debt sales to quarterly dates.
- In 1929, the Treasury introduced a new financial instrument to mitigate these flaws.
- Treasury bills were auctioned rather than offered for sale at a fixed price and were sold on an as-needed basis instead of on a quarterly schedule.
- By introducing a new class of securities, the Treasury was able to address the defects in the existing primary market structure even as it continued to maintain that structure.

## 1. INTRODUCTION

The introduction of a new financial instrument by a sovereign issuer is never a trivial event. New instruments require the development of marketing programs and accounting systems, consume disproportionate amounts of senior executive time, and not infrequently require new statutory authority. It is hardly surprising that the United States has introduced only a handful of new instruments since the development of a liquid, national market for Treasury securities during World War I, including savings bonds, STRIPS, foreign-targeted Treasury notes, and TIPS (Box 1).

This article examines the U.S. Treasury's decision to introduce a new financial instrument—Treasury bills—in 1929. We show that Treasury officials were willing to commit the resources required to introduce the new security in order to mitigate several flaws in the structure of Treasury financing operations, such as:

- *New debt offerings were chronically oversubscribed.* Reliance on fixed-price subscription offerings of new debt during the 1920s resulted in chronic oversubscriptions, a clear indication that the offerings were persistently underpriced.
- *The schedule for new debt sales resulted in negative “carry” on Treasury cash balances at commercial banks.* The Treasury sold new debt only four times a year—on tax

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Box 1

## New Financial Instruments Introduced by the U.S. Treasury after 1918

### Savings Bonds

Single-payment, intermediate-term non-marketable securities with fixed-price redemption options. Introduced in March 1935.

### Separate Trading of Registered Interest and Principal of Securities (STRIPS)

Single-payment securities derived by separating the principal and interest payments bundled together in conventional Treasury notes and bonds. Introduced in February 1985.

### Foreign-Targeted Treasury Notes

Notes providing for limited disclosure of ownership when owned by “United States Aliens.”<sup>a</sup> Four foreign-targeted notes were sold between October 1984 and February 1986.

### Treasury Inflation-Protected Securities (TIPS)

Coupon-bearing notes and bonds with principal and interest payments indexed to the consumer price index. Introduced in January 1997.

<sup>a</sup>A United States Alien is defined as a foreign corporation, nonresident alien individual, nonresident alien fiduciary of a foreign estate or trust, and certain related foreign partnerships. Treasury Circular no. 31-84, October 10, 1984, and Garbade (1987).

payment dates—and was consequently forced to borrow in advance of its needs and to inventory the proceeds in commercial bank accounts that earned interest at a rate lower than that paid by the Treasury on its indebtedness, resulting in negative carry on the account balances.

- *The Treasury had to arrange short-term loans from Federal Reserve Banks to make maturity payments.* Treasury officials set new issues to mature on tax payment dates. This schedule forced the Treasury to borrow from the Federal Reserve to bridge the gap between the date it needed to make a maturity payment and the date it actually collected tax receipts—typically several days after the stated due date. The short-term Reserve Bank loans sometimes created transient fluctuations in reserves available to the banking system and undesirable volatility in overnight interest rates.

We begin by describing in Section 2 the structure of Treasury financing operations in the mid-1920s and explaining how that structure had evolved in support of an important objective of federal fiscal policy: paying down, as expeditiously as possible, the debt incurred in the course of financing World War I. Section 3 describes the flaws in the structure of Treasury financing operations, and Section 4 shows how Treasury

officials planned to correct or mitigate the flaws with Treasury bills. The evolution of bill financing in the early 1930s is described briefly in Section 5. Section 6 concludes.

## 2. TREASURY FINANCING OPERATIONS IN THE MID-1920S

The two principal objectives of federal fiscal policy in the 1920s were tax reduction and paying down the war debt. In mid-1914, there was only \$968 million of interest-bearing Treasury debt outstanding; by mid-1919, the debt had ballooned to \$25.2 billion.<sup>1</sup> Over the same period, the maximum tax rate on personal income had increased from 7 percent to 77 percent.<sup>2</sup>

Political leaders recognized that the tax system had become badly warped in the haste of responding to wartime requirements. In his 1919 State of the Union message, President Woodrow Wilson suggested that

Congress might well consider whether the higher rates of income and profits taxes can in peace times be effectively productive of revenue, and whether they may not, on the contrary, be destructive of business activity and productive of waste and inefficiency. There is a point at which in peace times high rates of income and profits taxes discourage energy, remove the incentive to new enterprise, encourage extravagant expenditures, and produce industrial stagnation.<sup>3</sup>

President Wilson’s first post-war Secretary of the Treasury, Carter Glass, argued that the tax system encouraged “wasteful expenditure,” penalized “brains, energy, and enterprise,” and discouraged new ventures.<sup>4</sup> Promptly after being sworn in as President on March 4, 1921, Warren Harding called a special session of the Congress to reduce personal and corporate taxes.<sup>5</sup>

Despite the intense interest in tax reduction, there was near-universal agreement that taxes should not be cut to levels that would impede expeditious debt reduction. In his address to

<sup>1</sup>1914 Treasury Annual Report, p. 46, and 1919 Treasury Annual Report, p. 186.

<sup>2</sup>Underwood-Simmons Tariff Act, October 3, 1913, 38 Stat. 114, and Revenue Act of 1918, February 24, 1919, 40 Stat. 1057.

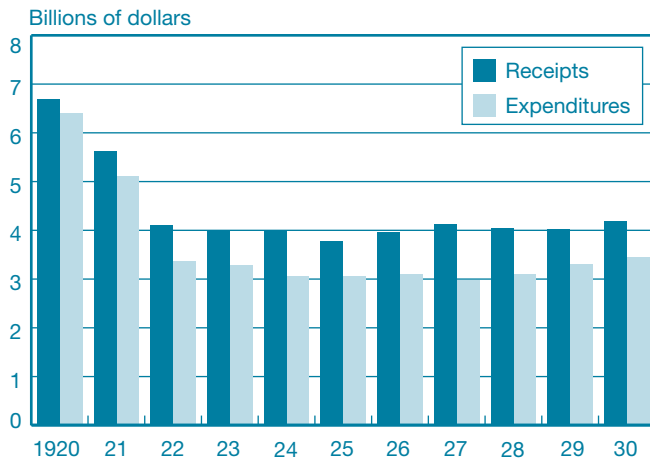
<sup>3</sup>“Text of President Wilson’s Message to Congress, Urging Return to Peace Basis,” *New York Times*, December 3, 1919, p. 6.

<sup>4</sup>1919 Treasury Annual Report, p. 23.

<sup>5</sup>“Harding Will Call Special Session for April 4 or 11,” *New York Times*, March 8, 1921, p. 1, and “President to Call Congress April 11,” *New York Times*, March 15, 1921, p. 1. See also “President’s Address to Congress on Domestic and Foreign Policies,” *New York Times*, April 13, 1921, p. 7 (quoting Harding’s comment that “The most substantial relief from the tax burden must come for the present from the readjustment of internal taxes, and the revision or repeal of those taxes which have become unproductive and are so artificial and burdensome as to defeat their own purpose.”), and Smiley and Keehn (1995, p. 287) (by 1920, “Both Democrats and Republicans believed that . . . tax avoidance had reduced the revenue collected from the wealthiest Americans . . .”).

CHART 1

### Treasury Receipts and Expenditures (Other Than for Debt Retirement), Fiscal Year 1920 – Fiscal Year 1930



Source: Treasury annual reports.

the special session of the Congress in 1921, President Harding announced a policy of “orderly funding and *gradual liquidation*” of the debt.<sup>6</sup> Three years later, in the course of arguing for a second round of tax cuts, Secretary of the Treasury Andrew Mellon cautioned that “the Government must always be assured that taxes will not be so far reduced as to deprive the Treasury of sufficient revenue with which properly to run its business . . . and to take care of the debt.”<sup>7</sup> Debt reduction, Secretary Mellon claimed, was “the best method of bringing about tax reduction. Aside from gradual refunding at lower rates of interest, it is the only method of reducing the heavy annual interest charges.”<sup>8</sup>

Remarkably, the federal government was able to reduce both tax rates and the national debt in the 1920s. In a series of three revenue measures adopted between 1921 and 1926, the Congress reduced tax rates on personal income to a maximum of 25 percent.<sup>9</sup> Treasury receipts fell from their high-water

<sup>6</sup> “President’s Address to Congress on Domestic and Foreign Policies,” *New York Times*, April 13, 1921, p. 7. Emphasis added. Cannadine (2006, p. 278) describes Harding’s economic agenda as a restoration of “the prewar climate of low taxes, balanced budgets, manageable national debt, limited government, and a functioning international economy backed by the gold standard.”

<sup>7</sup> Mellon (1924, p. 20). Emphasis added.

<sup>8</sup> 1924 Treasury Annual Report, p. 26. Mellon reiterated his view of the link between debt reduction and tax reduction in 1926: “As long as there are enormous fixed debt charges . . . no large reduction in total expenditures is possible. . . . [T]he more rapidly the debt is retired, the sooner will come the time when these charges can be practically eliminated.” 1926 Treasury Annual Report, pp. 33-4.

mark of \$6.75 billion in fiscal year 1920 to \$4 billion in 1922 in the wake of a severe post-war recession, but then leveled off—and even rose a bit in the second half of the decade—as a result of rapidly expanding economic activity. At the same time, the Congress was able to effect significant expenditure reductions. The result was a budget surplus in every fiscal year from 1920 to 1930 (Chart 1). The surpluses underwrote a 37 percent reduction in Treasury indebtedness—to \$16 billion by the end of the decade.

*Despite the intense interest in tax reduction, there was near-universal agreement that taxes should not be cut to levels that would impede expeditious debt reduction.*

To understand how the Treasury structured its financing operations to support the goal of debt reduction, we first have to understand how the war was financed.

## 2.1 Financing World War I

The entry of the United States into World War I, on April 6, 1917, set off a prolonged national debate over whether the war should be financed with debt or taxes. Some, like Senator Furnifold Simmons of North Carolina, took a position at the debt end of the spectrum: “It has been the custom of this country to pay war bills by bond issues, and I see no reason for a change in that policy.”<sup>10</sup> The nation’s most prominent financier, J. P. Morgan, believed that no more than 20 percent of war expenses should be paid from taxes; President Wilson’s wartime Secretary of the Treasury, William McAdoo, thought half was preferable.<sup>11</sup> Further along the spectrum, the *New York Times* reported that “some members of Congress are advocating the raising of 75 per cent of the first year needs by taxation,” and leading economists at forty-three colleges and universities signed a petition urging taxation as the principal means of finance.<sup>12</sup>

The central issue was whether debt could transfer the burden of the war to future generations. Economists agreed that it could—if the debt were sold to foreigners.<sup>13</sup> In that case, the war might require little sacrifice in current living standards.

<sup>9</sup> See Blakey (1922, 1924, and 1926), Smiley and Keehn (1995), Murnane (2004), and Cannadine (2006, pp. 287-8 and 313-8).

<sup>10</sup> Quoted in Adams (1917, p. 292).

The debt would have to be repaid, but repayment would be funded from taxes imposed on later generations. However, since there were no other countries from which to borrow in 1917 (Japan was the only major country not already involved in the conflict), there was no essential difference—from an *aggregate* point of view—between debt financing and tax financing. Either way, the entire cost of the war had to be borne immediately, by Americans, in the form of reduced consumption.<sup>14</sup>

Economists also agreed that debt financing and tax financing differed at a *disaggregated* level and that debt financing facilitated intertemporal reallocations of the burdens of war among individuals. Roy Blakey, an economist at the University of Minnesota, observed that “when a war comes

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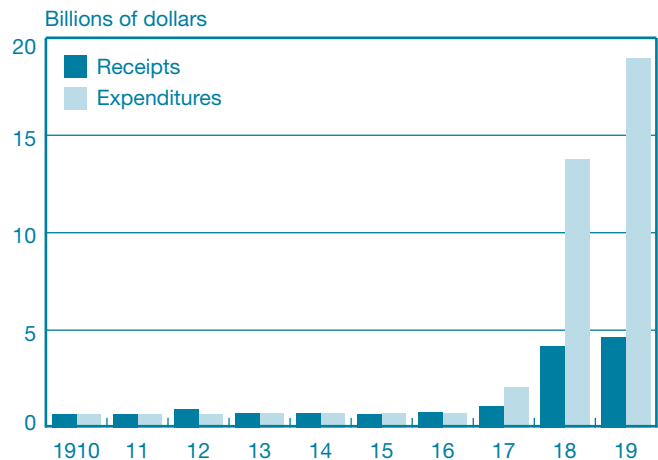
unexpectedly it may find many individuals unprepared to pay their just shares of a new and large burden. It may be best all around to permit some to assume the burden of others temporarily, either wholly or in part.”<sup>15</sup> Blakey appreciated that individuals as well as governments can borrow, but he concluded that there were good reasons to prefer public, rather than private, finance: “In so far as the government can make easier advantageous credit transactions by itself assuming the borrowing agency instead of leaving the transactions to be arranged through individuals, there is a further net gain.”<sup>16</sup>

<sup>11</sup> Morgan’s view is reported in McAdoo (1931, p. 383). For McAdoo, see “Senate Will Pass Bond Bill Quickly,” *New York Times*, April 13, 1917, p. 3 (“McAdoo believes that about half the expenses of the war should be paid from current revenues....”), McAdoo (1931, p. 372) (“I hoped to raise about half of the expenditures through taxes.”), and the April 14, 1917, letter from McAdoo to Cleveland H. Dodge, a prominent philanthropist and Princeton classmate of Woodrow Wilson, quoted in Synon (1924, pp. 222-3) (“As to taxation, my feeling has been that fifty per cent of the cost of the war should be financed by it.”). McAdoo later revised his thinking to one-third taxes and two-thirds debt. See his letter to the chairman of the House Ways and Means Committee quoted in “M’Adoo Advises Doubling War Tax,” *New York Times*, June 7, 1918, p. 1 (“I believe that if we are to preserve the soundness and stability of our financial system, we should raise by taxation not less than one-third of the estimated expenditures for the fiscal year 1919....”).

<sup>12</sup> “Big War Loan Bill Ready for Debate,” *New York Times*, April 12, 1917, p. 2, “Economists United in Favor of War Tax,” *New York Times*, April 19, 1917, p. 24, “College Men Want Direct Taxes Instead of Bonds,” *Boston Daily Globe*, April 19, 1917, p. 7, and “Taxation is Favored to Meet War Expenses,” *Atlanta Constitution*, April 19, 1917, p. 6.

<sup>13</sup> See, for example, Blakey (1918, p. 92).

CHART 2  
Treasury Receipts and Expenditures,  
Fiscal Year 1910 – Fiscal Year 1919



Source: Treasury annual reports.

The question of debt versus tax financing was resolved during the course of the war in a series of incremental actions, including especially new tax legislation.<sup>17</sup> Chart 2 shows Treasury receipts and expenditures prior to and during the war. Assuming (based on the pre-war data) “normal” receipts and expenditures of about \$750 million per year, approximately one quarter of the cost of the war was financed with war taxes.<sup>18</sup>

<sup>14</sup> See, for example, Anderson (1917, p. 860) (“Our own citizens must *pay now* out of current income whatever the government spends now, and, taking the nation as a whole, it is *simply impossible* for ‘posterity to share the burdens’....”) and Durand (1917, p. 892) (“For *the people considered as a whole, domestic borrowing postpones no burden to the future*.... Borrowing at home, so far as a nation as a whole is concerned, is precisely similar to borrowing by an individual from himself.... *The idea that the burden of war expenditures can be deferred to future generations is the supreme fallacy of finance.*”) Emphasis in the original.

<sup>15</sup> Blakey (1918, p. 93). See also Blakey (1917, p. 813) (“Among persons of equal means, some are in a much better position to economize at this time than are others; hence, some borrowing is socially justifiable because it allows accommodation as between individuals.”) and Durand (1917, pp. 906-7).

<sup>16</sup> Blakey (1918, p. 94).

<sup>17</sup> The major wartime tax acts were the War Revenue Act of 1917, October 3, 1917, 40 Stat. 300, and the Revenue Act of 1918. See Blakey (1917) and Blakey and Blakey (1919).

<sup>18</sup> Annual fiscal year receipts and expenditures in excess of “normal,” in billions of dollars, were:

	Receipts	Expenditures
1917	\$0.374	\$ 1.336
1918	3.430	13.043
1919	<u>3.904</u>	<u>18.202</u>
Total	\$7.708	\$32.581

The total excess of war-related tax receipts of \$7.7 billion was 23.7 percent of the \$32.6 billion in excess expenditures.

TABLE 1  
Liberty Loans

	First	Second	Third	Fourth	Victory Liberty Loan
Description	Thirty-year bond, callable in fifteen years	Twenty-five-year bond, callable in ten years	Ten-year bond, not callable	Twenty-year bond, callable in fifteen years	Four-year note, callable in three years
Coupon rate (percent)	3½	4	4¼	4¼	3¾ if nontaxable, 4¾ if taxable
Dated date	June 15, 1917	November 15, 1917	May 9, 1918	October 24, 1918	May 20, 1919
First call date	June 15, 1932	November 15, 1927	Not callable	October 15, 1933	June 15, 1922
Maturity date	June 15, 1947	November 15, 1942	September 15, 1928	October 15, 1938	May 20, 1923
Amount offered (billions of dollars)	2.0	3.0	3.0	6.0	4.5
Amount subscribed (billions of dollars)	3.0	4.6	4.2	7.0	5.2
Amount sold (billions of dollars)	2.0	3.8	4.2	7.0	4.5
Subscription period	May 14–June 15, 1917	October 1–27, 1917	April 6–May 4, 1918	September 28– October 19, 1918	April 21– May 10, 1919

Source: Treasury annual reports.

The Treasury raised \$21.5 billion during the war by floating five enormous Liberty loans (Table 1); it also raised additional sums with monthly—sometimes biweekly—sales of short-term certificates of indebtedness. (Certificates of indebtedness were coupon-bearing securities that matured in a year or less. There was \$3.45 billion in certificates outstanding in mid-1919.)

All wartime security sales were by subscription. Treasury officials set the coupon rate on a new issue and then offered it to investors at a price of par. Subscription books for the Liberty loans remained open for three or four weeks; subscription books for certificates of indebtedness remained open for as little as one day, more typically for several weeks, and in one exceptional case for almost three months, depending on the pace of sales and how much the Treasury wanted to sell.<sup>19</sup> The Treasury sometimes sold a fixed amount of Liberty loans that it specified *ex ante* (as in the sales of the First Liberty bonds and the Victory Liberty notes—see Table 1) and sometimes filled all subscriptions in full (as in the sales of the Third and Fourth

Liberty bonds). In cases where investors subscribed for an amount more than Treasury officials wanted to sell, officials allotted securities on the basis of order size, with a preference given to small orders to effect a broader distribution to retail investors. Table 2 presents an example.

To facilitate subscriptions to Liberty loans and certificates of indebtedness, the Treasury and the twelve district Federal Reserve Banks (acting as fiscal agents for the United States) created and managed a system of “War Loan Deposit Accounts” at commercial banks around the country.<sup>20</sup> A bank typically paid for its own and its customers’ purchases of Treasury securities by crediting the War Loan Deposit Account that the Treasury maintained at the bank. When funds were needed to meet expenses, the Treasury would request that some of the balances be transferred to Treasury accounts at Federal Reserve Banks (from which the Treasury paid most of the bills of the federal government). The system of War Loan accounts was important because it encouraged subscriptions: banks could pay for their purchases and the purchases of their customers with deposit credits in lieu of “immediately available” funds, that is, funds on deposit at a Federal Reserve Bank.<sup>21</sup> War Loan deposit liabilities were relatively inexpensive

<sup>19</sup> Subscription books for the first series of certificates offered to the public opened—and closed—on the same day that President Wilson signed the First Liberty Bond Act, April 24, 1917, 40 Stat. 35, that authorized their issue. “Secretary McAdoo to Sell Certificates,” *Wall Street Journal*, April 21, 1917, p. 5, “Loan Will Be Made at Once,” *New York Times*, April 25, 1917, p. 1, and “U.S. Certificates to be Paid for Today,” *Wall Street Journal*, April 25, 1917, p. 8. A later certificate series, designated series T-G, remained open from mid-August to early November 1918. “Tax Certificates at 4½% Meet Investment Conditions,” *Wall Street Journal*, November 7, 1918, p. 10, and 1918 Treasury Annual Report, pp. 215–6. See also “U.S. Tax Certificates Have Five Coupons Attached,” *Wall Street Journal*, October 12, 1918, p. 10.

<sup>20</sup> Section 7 of the First Liberty Bond Act provided that “the Secretary of the Treasury, in his discretion, is hereby authorized to deposit in such banks and trust companies as he may designate the proceeds . . . arising from the sale of the bonds and certificates of indebtedness authorized by this Act . . .” The system of War Loan accounts was the forerunner of the modern Treasury Tax and Loan system. See Garbade, Partlan, and Santoro (2004), Lovett (1978), McDonough (1976), and Brockschmidt (1975).



TABLE 2

## Subscription Allotments on First Liberty Loan

Subscription	Allotment
Up to and including \$10,000	100 percent
\$10,000 to \$100,000	60 percent, but not less than \$10,000
\$100,000 to \$250,000	45 percent, but not less than \$60,000
\$250,000 to \$2,000,000	30 percent, but not less than \$112,500
\$2,000,000 to \$6,000,000	25 percent, but not less than \$600,000
\$6,000,000 to \$10,000,000	21 percent
Over \$10,000,000	Average of 20.2 percent

Source: 1917 Treasury Annual Report, p. 8.

and cost banks only 2 percent per annum.<sup>22</sup> (By comparison, borrowing from a Federal Reserve Bank cost between 3 and 4½ percent per annum in 1917 and 1918.)<sup>23</sup>

## 2.2 The Mechanics of Paying Down the Debt

The principal problem facing Treasury debt managers in the 1920s was how to pay down the large Liberty loans with budget surpluses that became available only gradually over time. They solved the problem with a carefully constructed program of 1) exchange offers of new notes and bonds for Liberty loans approaching maturity, 2) cash refinancings (with short-term certificates and intermediate-term notes) of maturing Liberty loans, and 3) cash repurchases of debt near maturity and cash redemptions at maturity. Tilford Gaines, in his groundbreaking study of Treasury debt management, concluded that “the decade of the 1920’s witnessed what is probably the most effective execution of debt management policy, in a technical sense, in the history of the country.”<sup>24</sup>

Gaines pointed out that

Policy actions of the 1920’s were directed toward specific, clearly-stated objectives. Maturing securities were redeemed if funds were available . . . if not, they

<sup>21</sup> Additionally, the War Loan Deposit Account System avoided draining reserves from the private banking system into Treasury accounts at Federal Reserve Banks when investors paid for their securities.

<sup>22</sup> The 2 percent rate was established prior to the war for an earlier depository system that was limited to national banks. See “Banks Must Pay 2 Per Cent,” *New York Times*, April 24, 1912, p. 15, “Government Special Deposits,” *Wall Street Journal*, April 25, 1912, p. 8, “Money,” *Wall Street Journal*, April 26, 1912, p. 8, “Must Pay Interest on Nation’s Cash,” *New York Times*, May 1, 1913, p. 1, “Banks Must Pay Interest on All Government Deposits,” *Wall Street Journal*, May 2, 1913, p. 8, 1912 Treasury Annual Report, p. 149, and 1913 Treasury Annual Report, pp. 5 and 211.

<sup>23</sup> Board of Governors of the Federal Reserve System (1943, p. 439).

<sup>24</sup> Gaines (1962, p. 27).

TABLE 3

Treasury Debt in Mid-1923  
Billions of Dollars

Pre-war debt		0.87
Liberty Loans		
First Liberty Bond	1.95	
Second Liberty Bond	3.20	
Third Liberty Bond	3.41	
Fourth Liberty Bond	6.33	
Total		14.89
Post-war debt		
Certificates of indebtedness	1.03	
Notes	4.10	
Bonds	0.76	
Total		5.89
Other debt		0.35
Total debt		22.01

Source: 1923 Treasury Annual Report, pp. 134-5.

were refunded to a carefully selected niche in the debt structure where, when they matured, funds might be expected to be available to redeem them.<sup>25</sup>

and that

At a purely technical level, the job done by Secretary Mellon during the 1920’s was superb. Each operation, whether intra-year certificate financing or refunding the Liberty and Victory loans, was carefully planned and conducted through a series of steps that at no time overstrained the market’s absorptive capacity. The program was orderly, with ample advance notice to the market before each step, and predictable, in the sense that the Secretary’s program and intentions were clearly understood.<sup>26</sup>

Treasury indebtedness stood at \$22 billion in mid-1923 (Table 3). During the preceding four years, the Treasury had paid off the Victory notes, reduced the outstanding amount of the four remaining Liberty bonds to \$15 billion, and reduced the short-term debt to \$1 billion. In the process, it had issued \$4 billion of new notes maturing between June 1924 and December 1927 (Table 4) as well as a modest amount (\$760 million) of new bonds. The new notes had been issued for two reasons: to refinance \$2.6 billion of short-term certificates of indebtedness to dates after the Victory notes matured in May 1923 but before the Third Liberty bonds came

<sup>25</sup> Gaines (1962, p. 29).

<sup>26</sup> Gaines (1962, p. 34).

TABLE 4

### Treasury Notes Issued between 1921 and 1923 to Refinance Shorter Term Debt and Maturing Victory Notes

Issue Date	Coupon (Percent)	Maturity	Amount (Millions of Dollars)
June 15, 1921	5¾	June 15, 1924	311
September 15, 1921	5½	September 15, 1924	391
February 1, 1922	4¾	March 15, 1925	602
December 15, 1922	4½	June 15, 1925	469
June 15, 1922	4¾	December 15, 1925	335
March 15, 1922	4¾	March 15, 1926	618
August 1, 1922	4¼	September 15, 1926	487
May 15, 1923	4¾	March 15, 1927	668
January 15, 1923	4½	December 15, 1927	367
		Total	4,248

Source: Treasury annual reports.

due in September 1928, and to refinance a portion of the maturing Victory notes.

All the new notes matured on the fifteenth of the third month of a calendar quarter—when most individuals and corporations made quarterly income tax payments.<sup>27</sup> This was no accident; rather, it was part of a larger scheme designed to facilitate redemption of the notes and, more generally, redemption of the war debt. As a tax payment date approached, Treasury officials estimated the receipts they were about to receive and the funds they were likely to disburse during the coming quarter. They used balances in Treasury accounts at Federal Reserve Banks and in War Loan Deposit Accounts at commercial banks equal to the estimated excess of receipts over expenditures to redeem some of the maturing debt, and they refinanced the remainder to a subsequent tax date.<sup>28</sup> The 1922 Treasury Annual Report noted that the practice of having issues

<sup>27</sup> The Revenue Act of 1918 provided that the tax on income earned in a particular year was due in four quarterly installments during the following year, on March 15, June 15, September 15, and December 15.

<sup>28</sup> See, for example, 1926 Treasury Annual Report, p. 35 (“A few weeks prior to the 15th of each September, December, March, and June the Treasury determines what income it will need to meet expenditures during the coming quarter, taking into account, on the receipt side, the cash in the general fund and the Government receipts to be expected, and, on the expenditure side, the amount of cash required to meet obligations maturing during the quarter, and the probable expenses of the Government during the quarter.”) and p. 39 (“New issues of public debt securities in regular course are made only on tax-payment dates and the amount of the issue is determined by the estimated cash requirements of the Treasury to the next payment date in excess of the cash in hand and the estimated receipts from taxes and other sources of revenue.”).

mature on quarterly tax dates absorbed “any surplus revenues which may be available. This gives the best assurance of the gradual retirement of the war debt, and is perhaps the greatest advantage of the short-term [that is, note] refunding which the Treasury has been carrying on, for by distributing the debt over early maturities in amounts not too large to be financed each year these refunding operations have given the Treasury control over the debt and its retirement. . . .”<sup>29</sup>

Table 5 illustrates how the scheme worked. The first column shows the four tax payment dates in 1925. The second column shows the amount of securities maturing on

*The “regularization” of Treasury financing operations on quarterly tax dates was an important innovation in Treasury debt management.*

each of the four dates. The third shows the amount of securities issued on each date, including a 29¾-year bond in March and certificates of indebtedness in every quarter. The fourth shows the amount paid down.

The “regularization” of Treasury financing operations on quarterly tax dates was an important innovation in Treasury debt management.<sup>30</sup> The regularity enhanced the predictability of Treasury operations and facilitated the integration of Treasury debt management with Treasury cash management. Nevertheless, the system was not flawless. The maturities of new certificates varied erratically from quarter to quarter (Chart 3), and the sizes of new offerings also varied widely, depending on the amount maturing and the magnitude of anticipated tax receipts and expected expenditures (Chart 4). These features reduced the predictability of two important aspects of a financing: amount and term to maturity.<sup>31</sup> On balance, however, the

<sup>29</sup> 1922 Treasury Annual Report, p. 9. See also 1923 Treasury Annual Report, p. 20 (“Except for the issue of about \$750,000,000 of 25-30 year Treasury bonds in the fall of 1922, the refunding has all been on a short-term basis, and it has been arranged with a view to distributing the early maturities of debt at convenient intervals over the period before the maturity of the third Liberty loan in 1928 in such manner that surplus revenues may be applied most effectively to the gradual reduction of the debt. With this object in view all of the short-term notes issued in the course of the refunding have been given maturities on quarterly tax-payment dates, and all outstanding issues of Treasury certificates have likewise been reduced to tax maturities.”)

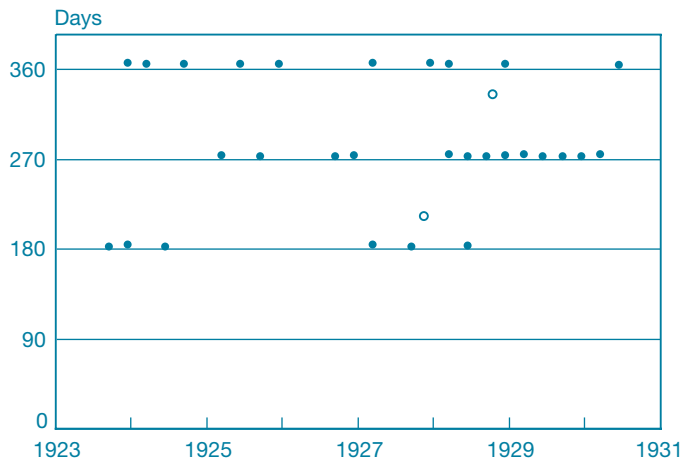
<sup>30</sup> There were only two cases after 1922 when certificates of indebtedness were sold on other than a tax payment date: an issue of 213-day certificates sold in November 1927 to finance the redemption of Second Liberty bonds and an issue of 335-day certificates sold in October 1928 to finance the redemption of Third Liberty bonds.

TABLE 5  
Refinancings and Paydowns on Tax Payment Dates in 1925

Date	Amount (Millions of Dollars)			Refinancing Securities
	Maturing	Issued	Paid Down	
March 15, 1925	560	509	51	\$219 million of a nine-month certificate maturing December 15, 1925, and \$290 million of a 29¾-year bond maturing December 15, 1954
June 15, 1925	400	124	276	One-year certificate maturing June 15, 1926
September 15, 1925	250	252	-2	Nine-month certificate maturing June 15, 1926
December 15, 1925	480	453	27	One-year certificate maturing December 15, 1925

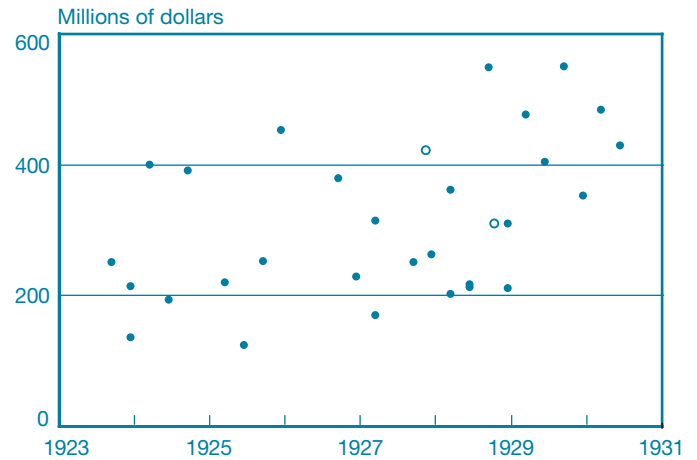
Sources: 1925 Treasury Annual Report, pp. 32 and 33; 1926 Treasury Annual Report, p. 41; “Treasury to Issue 4% Bonds at Premium,” *Wall Street Journal*, March 5, 1925, p. 8; “June Funding Issue Lowest Since War,” *New York Times*, June 8, 1925, p. 24; “New Treasury Issue Is \$250,000,000,” *New York Times*, September 8, 1925, p. 32; and “Treasury Will Seek a \$450,000,000 Loan,” *New York Times*, December 7, 1925, p. 37.

CHART 3  
Term to Maturity at Original Issuance of Certificates of Indebtedness



Source: Treasury annual reports.  
Note: Dark circles are certificates issued on tax payment dates; white circles are certificates issued on a date other than a tax payment date.

CHART 4  
Issue Size of Certificates of Indebtedness



Source: Treasury annual reports.  
Note: Dark circles are certificates issued on tax payment dates; white circles are certificates issued on a date other than a tax payment date.

program of regular quarterly financings was an innovative solution to the problem of paying down large debt issues with budget surpluses that became available only gradually, on a quarterly basis.

<sup>31</sup> In contrast, the Treasury regularized term to maturity and offering amounts as well as offering dates when it adopted a “regular and predictable” issuance strategy for notes and bonds in the 1970s (Garbade 2007).

### 3. STRUCTURAL FLAWS IN TREASURY FINANCING OPERATIONS

There were several important structural flaws in Treasury financing operations in the mid- and late 1920s. The flaws, all of which were well understood by early 1929, were attributable to the continuation of the wartime practices of selling securities in fixed-price subscription offerings and allowing banks to pay for purchases of securities with War Loan Deposit Account



credits, in addition to the newer practice of limiting Treasury debt sales to quarterly dates.

### 3.1 Fixed-Price Subscription Offerings

Fixed-price subscription offerings gave Treasury officials an incentive to offer securities at cheap prices, relative to contemporaneous market conditions, to limit the risk of a failed offering.

The risk of a failed offering was more than conjectural. In March 1920, Treasury officials proposed to raise between \$300 and \$350 million in an offering of one-year certificates.<sup>32</sup> Investors resisted what they believed to be an unreasonably low interest rate of 4¾ percent. In a meeting with Assistant Secretary of the Treasury Russell Leffingwell, New York bankers expressed intense dissatisfaction with the rate and suggested that the new certificates should pay “at least” 5 percent.<sup>33</sup> Investors subscribed for only \$200 million of the certificates, even though officials kept the subscription books open for two weeks after the issue date.<sup>34</sup> The *New York Times* described the response as “disappointingly small” and the *Wall Street Journal* labeled the 4¾ percent rate “a mistake.”<sup>35</sup> Two-and-a-half years later, in December 1922, the Treasury offered a total of \$400 million in three-month and one-year certificates, but garnered only \$310 million in subscriptions, including \$45 million in last-minute subscriptions from three Federal Reserve Banks.<sup>36</sup> These episodes gave Treasury officials clear incentives to avoid pricing their offerings close to the market, that is, selecting coupon rates close to contemporaneous market yields on outstanding issues with similar maturities.

Oversubscriptions—the principal indicia of underpricing—were a persistent characteristic of Treasury offerings throughout the 1920s (Chart 5). The *Wall Street Journal* pointed out the problem as early as April 1921: “The fact that there has been a big over-subscription to recent offerings of certificates of indebtedness, suggests that the rate fixed for the certificates has lately been slightly higher than the money market warranted.”<sup>37</sup> A month later, the *Wall Street Journal*

<sup>32</sup> “The Certificate Sale,” *New York Times*, March 23, 1920, p. 18.

<sup>33</sup> “Treasury Offers New 4¾% Tax Certificates,” *Wall Street Journal*, March 10, 1920, p. 12 (characterizing the bankers as “vexed”).

<sup>34</sup> 1920 Treasury Annual Report, p. 15.

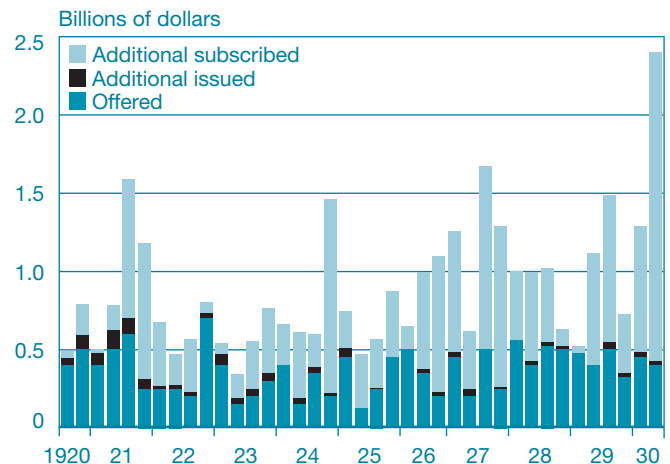
<sup>35</sup> “The Certificate Sale,” *New York Times*, March 23, 1920, p. 18, and “Treasury Made Mistake in Certificate Rate at 4¾%,” *Wall Street Journal*, March 30, 1920, p. 12.

<sup>36</sup> 1923 Treasury Annual Report, pp. 51-2, and letter dated December 16, 1922, from Under Secretary of the Treasury S. Parker Gilbert to Charles Morss, Governor, Federal Reserve Bank of Boston, Federal Reserve Bank of New York Archive File no. 410.5.

<sup>37</sup> “Government Borrowing by Tender Suggested Here,” *Wall Street Journal*, April 14, 1921, p. 4.

CHART 5

### Amounts Offered, Issued, and Subscribed in Quarterly (Tax Payment Date) Offerings of Treasury Securities



Source: Treasury annual reports.

remarked on the advantage of auctioning securities: “Bankers point out that [the \$275 million oversubscription on an offering of \$200 million of nine-month certificates] is another illustration of the advantage that might have been afforded by adopting the system of offering the certificates at tender. Had they been offered by tender a considerable saving might have been effected.”<sup>38</sup>

### 3.2 Infrequent Offerings

The decision to limit security sales to a quarterly schedule compelled the Treasury to borrow in advance of actual requirements and inventory the proceeds in War Loan accounts until they were needed. In testimony before the House Ways and Means Committee in May 1929, Under Secretary of the Treasury Ogden Mills observed that “it is reasonably clear that if you are going to borrow only four times a year, you have got to borrow in advance of requirements.”<sup>39</sup> This method was expensive because the 2 percent interest rate that the Treasury earned on War Loan accounts was less than what it paid on its certificates of indebtedness.

<sup>38</sup> “Government Borrowing,” *Wall Street Journal*, May 19, 1921, p. 4.

<sup>39</sup> Committee on Ways and Means (1929, p. 3).

### 3.3 Late Tax Payments

Late tax payments sometimes led to undesirable volatility in overnight loan markets. The 1925 Treasury Annual Report observed that, “Frequently payments [on maturing issues] exceed [tax] receipts on the tax day, making it necessary to borrow temporarily from the Federal reserve bank on a special securities of indebtedness [sic] in anticipation of the tax receipts which it takes several days to collect. This places reserve bank funds temporarily on the market and results in easier money rates. Rates tighten up again, however, when the loan is repaid, upon the collection of the tax checks.”<sup>40</sup>

### 3.4 Substitution of Treasury Deposits for Other Sources of Funds

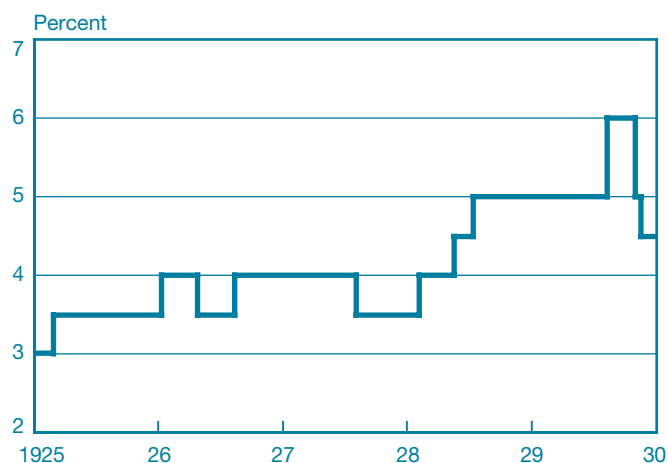
Banks learned in the 1920s that they could use Treasury securities subscriptions to substitute Treasury deposits for other, more expensive, sources of funds. A bank would first subscribe to a new offering, promising to pay by crediting the Treasury’s War Loan Deposit Account at the bank. After receiving notice of its allotment, the bank would sell the new securities for settlement on the issue date and, following settlement, use the proceeds to reduce other borrowings. The net result was a reduction in the cost of funds to 2 percent per annum during the period between the issue date of the securities and the date the Treasury called for its War Loan balances.

Substituting War Loan deposits for other sources of funds became increasingly attractive when the Reserve Banks began to raise discount rates in 1928 (Chart 6). Substitution made economic sense even if a bank had to sell its allotment at a discount from the par subscription price, as long as interest rates were high enough and the period in which the bank could expect to retain War Loan balances was long enough. In June 1928, the *New York Times* reported bank sales of new certificates at prices of 99-31/32 and 99-30, even though the certificates had been heavily oversubscribed:

<sup>40</sup> 1925 Treasury Annual Report, p. 44. See, for example, the episode described in the Federal Reserve Bank of New York’s *Monthly Review*, April 1, 1930, pp. 1-2, in which a temporary \$200 million increase in member bank reserves led to a transient decline in call loan rates. Treasury borrowings from the Federal Reserve typically lasted for about five days. Committee on Ways and Means (1929, p. 9). To dampen these episodes of transient ease, the Reserve Banks sometimes sold participations in their Treasury loans to member banks. At other times, member banks used the surplus reserve balances to reduce temporarily their Reserve Bank borrowings. “New Factor Enters Treasury Financing,” *New York Times*, December 15, 1929, p. N11. Meltzer (2003, p. 203, n. 106) reports that, in July 1924, the Open Market Investment Committee (a forerunner of the Federal Open Market Committee) approved a proposal to sell and repurchase securities to reduce transient dips in money market rates during tax payment periods. Beckhart, Smith, and Brown (1932, p. 357) describe other methods of draining excess reserves.

CHART 6

#### Federal Reserve Bank of New York Discount Rate



Source: Board of Governors of the Federal Reserve System (1943, pp. 440-1).

This paradox of an issue being apparently heavily oversubscribed [at a primary market offering price of par] at the same time that [secondary market] sales are being made below par was explained by conditions in the money market and the opportunity for profit arising out of the methods by which the Government securities are sold to the banks, their largest purchasers. When Government securities are awarded on subscription the banks do not pay for them at once, but credit the Treasury’s account with the sum involved. This money is left on deposit until the Treasury calls for it, a period which is usually two or three weeks and sometimes stretches into months. The banks pay the Treasury 2 per cent interest on these deposits.<sup>41</sup>

The following April, the *New York Times* reported that wide spreads between open market interest rates and the War Loan Deposit Account rate gave banks an incentive “to bid for larger amounts of Treasury securities than they ordinarily would take, and they often sell the securities as soon as they are allotted. At times, this produces the spectacle of a Treasury issue being heavily over-subscribed and simultaneously selling below par . . . a situation that makes for confusion and artificial values in Treasury financing.”<sup>42</sup>

In response to bank oversubscriptions for, and prompt sales of, new Treasury offerings, nonbank investors began to abstain from subscribing for new issues, electing instead to acquire the securities in post-offering secondary market transactions.

<sup>41</sup> “Sales Reported in Treasury Issue,” *New York Times*, June 9, 1928, p. 25.

<sup>42</sup> “New Treasury Plan Similar to English,” *New York Times*, April 28, 1929, p. 39.

Under Secretary Mills summed up the problem in his 1929 testimony before the Ways and Means Committee:

“There has grown up recently a practice on the part of the banks which was somewhat detrimental to the credit of the Government. Banks unquestionably subscribe for Government certificates because of the deposit privilege. During the last year or so, which has been a period of tight money, a practice has developed on the part of the banks of selling these certificates sometimes even before they are issued. In other words a bank can afford to subscribe for these certificates and sell them at a loss of say two-thirty-seconds or four-thirty-seconds and even six-thirty-seconds and still show a profit on the transaction, providing it can keep the Government deposit for 30 or 40 days. What the bank is really doing is borrowing from the Government of the United States at 2 per cent for 30 or 40 days, and it can use that money at once to pay off its indebtedness to the Federal reserve bank, in which it is paying 5 per cent. It can of course afford under these circumstances to sell these certificates at a discount. So that Government certificates during the course of the last year have sold at less than par almost immediately when they were issued. And, of course, those corporations and individuals who want to invest in Government securities, having observed that they show a tendency to go below par almost immediately after issue, refrain from putting in their subscriptions at the time the certificates are offered and rely on their ability to buy them in the market afterwards.”<sup>43</sup>

Allowing banks to pay for securities with War Loan Deposit Account credits did not benefit either the Treasury or the banks. The Treasury gained by being able to issue securities to banks at a higher price than the general public was willing to pay, but earned only 2 percent on the proceeds left on deposit with the banks. Banks gained from accessing cheap Treasury balances, but lost when they sold certificates to nonbank investors at prices below par. Nonbank investors neither gained nor lost (as long as they waited to buy securities in the secondary market). The principal consequence of the scheme was a primary market increasingly limited to banks and opaque to the general public.

### 3.5 Summary

By the beginning of 1929, Treasury officials understood the flaws in the existing structure of Treasury financing operations:

- 1) Fixed-price subscription offerings resulted in chronic oversubscriptions, a clear indication that offerings were persistently underpriced.

<sup>43</sup> Committee on Ways and Means (1929, pp. 4-5).

- 2) Infrequent quarterly financings forced the Treasury to borrow in advance of its needs and to inventory the proceeds in low-yielding War Loan Deposit Accounts.
- 3) Late tax payments forced the Treasury to fund the redemption of debt maturing on tax payment dates with Federal Reserve Bank loans.
- 4) The ability of banks to pay for new issues by crediting War Loan accounts led to the substitution of War Loan deposits for other sources of funds, led banks to further oversubscribe for new issues (in order to generate larger War Loan balances), and contributed to the appearance of a weak secondary market in new issues. The anomaly of oversubscribed issues selling below the par subscription price suggests that Treasury officials priced securities too high for nonbank investors in 1928 and 1929, even if they were cheap for bank subscribers.

The next section describes how Treasury officials mitigated the flaws in their financing operations.

## 4. INTRODUCTION OF TREASURY BILLS

In early 1929, J. Herbert Case, the Deputy Governor of the Federal Reserve Bank of New York, journeyed to London to study the British Treasury bill market. The study, undertaken at the behest of Under Secretary of the Treasury Ogden Mills, was intended to clarify whether the British system of issuing bills could be adapted for use in the United States.<sup>44</sup> Upon his return, Case filed a report describing the British system (Box 2) and recommended that a variant of the system be introduced in the United States.<sup>45</sup>

Case’s plan had four major provisions:

- 1) Treasury bills would be auctioned rather than offered for sale at a fixed price. He pointed out that “Competitive

<sup>44</sup> Case’s trip was not his first involvement in this matter. In January 1928, Case provided a detailed analysis of the British bill market to Benjamin Strong, Governor of the Federal Reserve Bank of New York, in which he explored several ways the British system could be adapted to American markets. Memo dated January 4, 1928, from Case to Strong, “Discussion of method of handling short term debt by United States Treasury, including comparison with British Treasury method,” Federal Reserve Bank of New York Archive File no. 413.7. In his 1928 memo, Case focused on the use of regular, possibly weekly, bill offerings to reduce Treasury borrowings before funds were needed, but also noted the advantages inherent in auctioning bills. He further noted that reliance on bill financing could result in the demise of the War Loan Deposit Account system, and he questioned whether such a demise would be a desirable result: “The depositary bank system was built up during the war and was unquestionably of great value to the Treasury in floating the war debt and in its subsequent refunding.”

<sup>45</sup> The report is attached to a letter dated February 16, 1929, from Case to Under Secretary Mills, Federal Reserve Bank of New York Archive File no. 413.7. Case also visited the Banque de France but did not make any detailed study of French debt management techniques.

Box 2

### The Primary Market for British Treasury Bills<sup>a</sup>

At the beginning of 1929, there was about £600 million in British Treasury bills outstanding. The British Treasury had been issuing bills since about 1877. Pre-war emissions were relatively small and infrequent, but issuance increased substantially during and following World War I.

British bills were auctioned weekly—on Friday, for settlement the following week—and matured three months later. Bidders submitted tenders that specified a price and amount as well as a settlement day sometime during the following week. Treasury officials sorted the tenders by settlement day and accepted proposals for a given settlement day in order of decreasing price until they had accounted for all of the funds needed to be raised on that day. Successful bidders paid for their bills with drafts on the Bank of England, that is, with immediately available funds.

The British system of bill financing—particularly the daily emissions and maturities—fitted nicely with the British income tax system. Although there were dates when taxes were nominally due, revenue officials had considerable discretion to arrange for alternative payment dates, so that payments did not all come in at virtually the same time. This ability eliminated any possibility of large, sporadic drains of reserve balances from the banking system and, taken together with the process of bill financing, made a system like the American War Loan Deposit Accounts unnecessary.<sup>b</sup>

<sup>a</sup>Based on memo dated January 4, 1928, from J. Herbert Case, Deputy Governor, Federal Reserve Bank of New York, to Benjamin Strong, Governor, Federal Reserve Bank of New York, “Discussion of method of handling short term debt by United States Treasury, including comparison with British Treasury method,” Federal Reserve Bank of New York Archive File no. 413.7, and report attached to letter dated February 16, 1929, from Case to Ogden Mills, Under Secretary of the Treasury, Federal Reserve Bank of New York Archive File no. 413.7. See also “New Treasury Plan Similar to English,” *New York Times*, April 28, 1929, p. 39.

<sup>b</sup>See also address of Under Secretary Mills before the Washington Chapter of the American Institute of Banking on April 24, 1929, reprinted in 1929 Treasury Annual Report, p. 279 (“The Treasury bill has been used for many years by the British Treasury as a most convenient and economical medium to obtain funds to meet current needs. They have so developed the system of financing by means of Treasury bills that, with weekly offerings, daily issues, and daily maturities, they have obtained a degree of flexibility that enables the Treasury to adjust its cash positions practically from day to day.”) and “Mills Explains Aim of Treasury Bills,” *New York Times*, April 25, 1929, p. 42.

bidding . . . might be expected to enable the Treasury to get the lowest discount rates consistent with current market conditions; it would not be necessary for the Treasury . . . to offer interest rates on new issues above current market rates.”

- 2) Bills would be sold when funds were needed.
- 3) Bill maturities would be set “to correspond closely to the actual collection of income taxes, and not all made to fall on the nominal date of tax payments as at present.”
- 4) Sales would be for cash, instead of credits to War Loan Deposit Accounts.

Point by point, these provisions would cure all of the existing flaws in the structure of Treasury financing operations. Case’s plan set the framework for the introduction of a new instrument to American financial markets.<sup>46</sup>

## 4.1 Obtaining Statutory Authority to Issue Bills

In late April 1929, the Treasury unveiled its proposal to correct the defects in its financing operations. Senator Reed Smoot, chairman of the Senate Finance Committee, and Representative Willis Hawley, chairman of the House Ways and Means Committee, took the first step by introducing legislation to allow the Treasury to issue zero-coupon bills with maturities of up to one year at a discount from face value.<sup>47</sup> (The Treasury needed new statutory authority to issue bills because existing statutes did not allow the sale of Treasury securities at a price less than par.)<sup>48</sup>

The proposed legislation required that the Treasury offer the new securities “on a competitive basis.”<sup>49</sup> Officials viewed auction offerings as a key provision. Treasury Secretary Mellon stated that “Competitive bidding . . . should enable the Treasury to get the lowest discount rates consistent with current market conditions.”<sup>50</sup> In testimony before the Ways and Means Committee, Under Secretary Mills pointed out the burden of fixed-price offerings as well as the advantage of auctions:

<sup>46</sup> “Case Heads Board of Reserve Bank,” *New York Times*, February 28, 1930, p. 14 (commenting that Case’s 1929 report was the basis for the Treasury’s introduction of Treasury bills).

<sup>47</sup> “Treasury for Sale of Notes Below Par,” *New York Times*, April 23, 1929, p. 27.

<sup>48</sup> Section 5 of the Second Liberty Bond Act of September 24, 1917, 40 Stat. 288, authorized the Secretary of the Treasury to issue certificates of indebtedness “at not less than par.” Section 1 of the same act authorized the issue of bonds and required that they “first be offered at not less than par as a popular loan.” The Victory Liberty Loan Act of March 3, 1919, 40 Stat. 1309, authorized the issue of notes “at not less than par.”

<sup>49</sup> See H.R. 1648, reprinted in Committee on Ways and Means (1929, p. 1).

<sup>50</sup> “Treasury for Sale of Notes Below Par,” *New York Times*, April 23, 1929, p. 27.



[T]he Treasury has the difficult task of estimating accurately current market conditions so as to adjust the interest rate as closely as possible to those conditions, using the best judgment that it can. It is not as difficult as it seems and yet, with money conditions fluctuating very rapidly from day to day, it is not an easy thing . . . . It would be more desirable both from the standpoint of the Treasury and I think of the public, if the market itself, by competitive bidding, should fix the interest rate, rather than have the Secretary of the Treasury use his best judgment in fixing the rate.<sup>51</sup>

Mills expressed the view that “the market will adjust the interest rate much more closely to actual market conditions than we can. We rather expect that these bids will be made in terms of one twenty-fifth of 1 per cent.”<sup>52</sup> (At the time, the Treasury was setting coupon rates on certificates of indebtedness in increments of 1/8 percent.)

The Congress quickly approved the proposed legislation, and President Hoover signed it into law on June 17, 1929.<sup>53</sup> During the following six months, Treasury officials worked out the details of the new security, such as the wording that would appear on the face of a bill and how it would be sold to the public.

## 4.2 The First Auction

On Tuesday, December 10, 1929, the Treasury announced the first bill auction, offering \$100 million of ninety-day bills for settlement on Tuesday, December 17, to mature Monday, March 17, 1930.<sup>54</sup> Auction tenders were due by 2 p.m. on Friday, December 13. Each tender had to state the amount bid for and a bid price, specified as a percentage of face amount with three digits of precision to the right of the decimal point<sup>55</sup>

<sup>51</sup> Committee on Ways and Means (1929, p. 3).

<sup>52</sup> Committee on Ways and Means (1929, p. 4).

<sup>53</sup> The Act of June 17, 1929, 46 Stat. 19, provided that the original issue discount on a bill was interest income and would be exempt from state and federal income taxes. However, any gains or losses upon sale prior to maturity, computed net of the accrued interest to the settlement date of the sale, was subject to capital gains tax. See Treasury Decision 4276, November 22, 1929, reprinted in 1930 Treasury Annual Report, pp. 306-8. The latter provision proved unworkable and was eliminated by the Act of June 17, 1930, 46 Stat. 775. See amended Treasury Circular no. 418, June 25, 1930, reprinted in 1930 Treasury Annual Report, pp. 309-12, letter dated June 30, 1930, from Andrew Mellon, Secretary of the Treasury, reprinted in 1930 Treasury Annual Report, p. 309, 1930 Treasury Annual Report, p. 23 (“The bookkeeping records required in order to calculate gains, as differentiated from exempt interest, were so complicated that a very real sales resistance resulted.”), and Beckhart, Smith, and Brown (1932, p. 354, fn. 34) (The corrective measure “was rendered necessary by the large amount of burdensome bookkeeping necessary to comply with the terms of the Act of June, 1929.”).

<sup>54</sup> Federal Reserve Bank of New York Circular no. 949, December 10, 1929. See also Treasury Circular no. 418, November 22, 1923, reprinted in 1930 Treasury Annual Report, pp. 303-6, and Federal Reserve Bank of New York Circular no. 944, November 23, 1929.

(for example, 99.172 percent). Tenders would be accepted in order of decreasing bid price (auction market participants could submit multiple tenders with different bids) and tenders at the lowest accepted price (the “stop-out” price) would be allotted securities on a pro-rata basis. Payment would be due on the settlement date in immediately available funds and could not be made by crediting a War Loan account.

On Saturday, December 14, the Treasury announced that investors had bid for \$224 million of the new bills and that it had accepted tenders starting at the highest bid, 99.310 percent, and stopping at 99.152 percent.<sup>56</sup> Tenders bidding at the stop were allotted 80 percent of the amount bid for.<sup>57</sup> The average accepted price was 99.181. A syndicate of two dealers, Salomon Brothers & Hutzler and the International Manhattan Company, won the major portion of the offering and promptly reoffered \$70 million of the bills at a discount rate of 3 1/8 percent, or a price of 99.219.<sup>58</sup>

Under Secretary Mills stated that he was “entirely satisfied” with the results of the auction and that the auction had resulted in “considerably cheaper money than we could get through the medium of certificates of indebtedness . . . .”<sup>59</sup> He further noted that the government would henceforth be able to tailor its borrowings more closely to its needs: “We will not be in a position where we have to borrow a lot of money and hold it in anticipation of needs for which we have only estimates . . . . We will sell government bills to fit the immediate needs and make the maturities fit into a known time of income, that is, the tax-paying dates.”<sup>60</sup>

## 4.3 Subsequent Bill Offerings in 1930

The Treasury offered Treasury bills on seven occasions in 1930 (Table 6). The offerings were all in the middle of the first or

<sup>55</sup> Bidding on a price basis insulated the Treasury from specifying how bids in terms of interest rates would be converted to prices. Market participants used a variety of conventions. For example, the price of a bill with  $n$  days to maturity quoted at a *discount rate* of  $D$  is  $P = 100 - (n/360) \times D$ . The price of the same bill quoted at a *money market yield* of  $R$  is  $P = 100 / [1 + .01 \times (n/360) \times R]$ . In the case of a ninety-day bill quoted at 4.50 percent,  $P = 98.875$  if the quoted rate is a discount rate, that is, if  $D = 4.50$  percent, and  $P = 98.888$  if the quoted rate is a money market yield, that is, if  $R = 4.50$  percent.

<sup>56</sup> “Plan Further Use of Treasury Bills,” *New York Times*, December 15, 1929, p. 16.

<sup>57</sup> “Treasury Bills Well Received,” *Wall Street Journal*, December 17, 1929, p. 12.

<sup>58</sup> “3 1/8% Discount Rate on Treasury Bills,” *New York Times*, December 16, 1919, p. 47. The International Manhattan Company was the securities division formed following the March 1929 merger of the International Acceptance Bank, Inc., and the Bank of Manhattan. The reoffering price is computed as  $99.219 = 100 - (90/360) \times 3.125$ .

<sup>59</sup> “Plan Further Use of Treasury Bills,” *New York Times*, December 15, 1929, p. 16, and “Issue Satisfies Mills,” *Wall Street Journal*, December 16, 1929, p. 11.

<sup>60</sup> “Plan Further Use of Treasury Bills,” *New York Times*, December 15, 1929, p. 16.



TABLE 6

## Treasury Bill Sales in 1930

Auction Date	Issue Date	Maturity Date	Term (Days)	Amount (Millions of Dollars)
February 14, 1930	February 18, 1930	May 19, 1930	90	50
April 11, 1930	April 15, 1930	July 14, 1930	90	50
May 15, 1930	May 19, 1930	August 18, 1930	91	100
July 10, 1930	July 14, 1930	September 15, 1930	63	50
August 14, 1930	August 18, 1930	November 17, 1930	91	120
October 10, 1930 <sup>a</sup>	October 15, 1930	December 16, 1930	62	50
October 10, 1930 <sup>a</sup>	October 16, 1930	December 17, 1930	62	50
November 13, 1930	November 17, 1930	February 16, 1931	91	125

Source: Treasury annual reports.

<sup>a</sup>The Treasury offered a total of \$100 million bills. Each accepted tender was allocated half of the amount bid for in bills issued on October 15 and maturing on December 16, 1930, and the other half in bills issued on October 16 and maturing on December 17, 1930.

second month of a quarter, suggesting that the Treasury did, in fact, modify its financing practices by selling bills when it needed cash.

It is interesting to note that four of the six offerings that matured in 1930 did not mature on a tax payment date (the exceptions are the July offering that matured in September and the twin offering in October that matured in December) and that all four of those offerings were refinanced at maturity with new bills. This suggests that Treasury officials began at an early date to incorporate Treasury bills into their debt management operations and that they did not limit the use of Treasury bills to sporadic cash management needs.

## 5. TREASURY BILLS IN THE EARLY 1930S

The Treasury began issuing bills just as the Great Depression was beginning. It is hardly surprising that officials did not use the new instrument quite as they had anticipated in 1929; evolving circumstances can prompt change in the use of any financial instrument.

As the contraction of 1930 deepened and hardened into depression in 1931, the Treasury began to issue thirteen-week bills almost every week (Chart 7). Although issue sizes varied from week to week (Chart 8), the aggregate volume of bills outstanding rose fairly steadily to more than \$500 million by the end of 1931 (Chart 9). The quantity of bills outstanding stabilized during 1932, but then rose sharply in 1933 and again in 1934, reaching almost \$2 billion at the end of 1934. By the end of 1934, Treasury bills had become an instrument of debt management—part of the more or less permanent debt of the nation.

Treasury officials did not originally intend to replace certificates of indebtedness with Treasury bills. Secretary Mellon stated in 1929 that “It is not the purpose of the Treasury Department . . . to discontinue the present depository method, or system of short-term financing, but rather to supplement it with the new system, using both as may prove to be most advantageous to the interests of the government.”<sup>61</sup> Nevertheless, when Treasury officials expanded bill issuance in 1934, they simultaneously stopped offering certificates of indebtedness. By the end of 1934, bills were *the* short-term instrument of Treasury debt management.

## 6. CONCLUSION

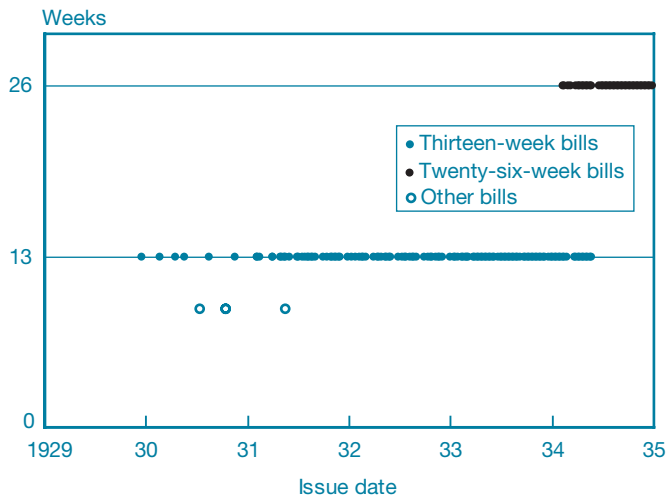
The U.S. Treasury began auctioning Treasury bills in 1929 to correct several flaws in the post-war structure of Treasury financing operations. The flaws included underpricing securities sold in fixed-price subscription offerings, infrequent financings that necessitated borrowing in advance of need, and payment with deposit credits that gave banks an added incentive to oversubscribe to new issues and contributed to the appearance of weak post-offering secondary markets for new issues.

All three flaws could have been addressed without introducing a new class of securities. For example, the Treasury could have begun auctioning certificates of indebtedness (instead of bills),<sup>62</sup> it could have begun offering certificates

<sup>61</sup> 1929 Treasury Annual Report, p. 275. See also the April 25, 1929, speech of Under Secretary Mills before the American Institute of Banking (1929 Treasury Annual Report, pp. 275-80, and “Mills Explains Aim of Treasury Bills,” *New York Times*, April 25, 1929, p. 42).

CHART 7

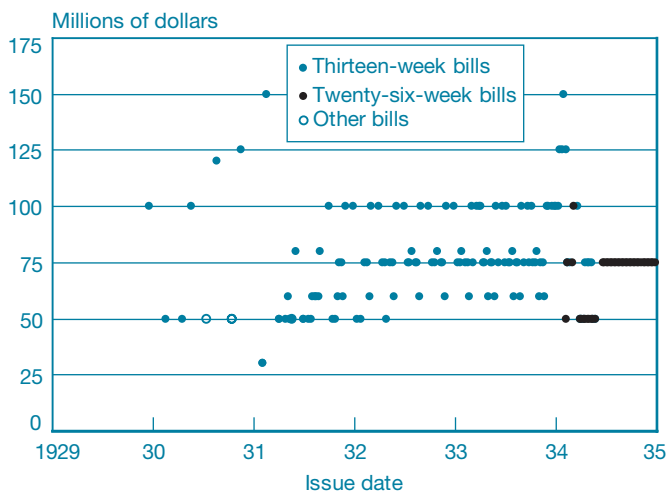
Term to Maturity of Treasury Bills



Source: Treasury annual reports.

CHART 8

Treasury Bill Amounts Issued

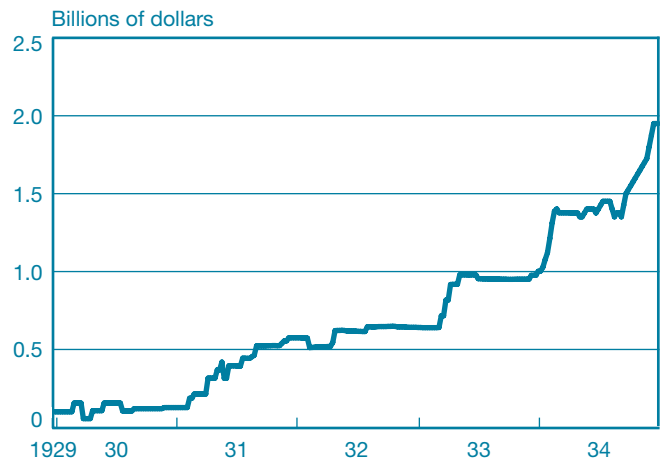


Source: Treasury annual reports.

<sup>62</sup> However, the statutory restriction on selling certificates of indebtedness below par would have limited the ability of the Treasury to offer the securities in an auction format. A minimum price restriction nearly led to a failed bond auction in 1894 (“Carlisle Talks to Bankers,” *New York Times*, January 30, 1894, p. 1, “Success Crowns the Loan,” *New York Times*, February 1, 1894, p. 1, Barnes 1931, pp. 315–8, and Carosso 1987, p. 316) and contributed to a failed auction in 1973 (Garbade 2004, p. 38).

CHART 9

Aggregate Amount of Treasury Bills Outstanding



Source: Treasury annual reports.

between quarterly tax dates, and it could have begun selling certificates for immediately available funds. However, by introducing a new class of securities, the Treasury was able to address the defects in the existing primary market structure even as it continued to maintain that structure. If auction sales, tactical issuance, and settlement in immediately available funds proved successful, the new procedure could be expanded to notes and bonds.<sup>63</sup> If subsequent experience revealed an unanticipated flaw in the new procedure, however, the Treasury was free to return to exclusive reliance on regularly scheduled fixed-price subscription offerings and payment by credit to War Loan accounts. The introduction of Treasury bills in 1929 gave the Treasury an exit strategy—as well as a way forward—in the development of the primary market for Treasury securities.

<sup>63</sup> The Treasury initially continued to offer notes and bonds on a fixed-price subscription basis, and continued to receive large oversubscriptions to those offerings, following the introduction of Treasury bills. (As noted earlier, the Treasury suspended certificate sales in 1934.) It attempted to introduce an auction system for bond sales in 1935, but the effort floundered and the Treasury thereafter sold notes and bonds on a fixed-price subscription basis through the early 1960s. It tried—and failed—to introduce auction sales of bonds again in 1963 and finally succeeded on its third attempt in the early 1970s. See Garbade (2004).

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