

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Bank Liquidity and the War

Volume Author/Editor: Charles R. Whittlesey

Volume Publisher: NBER

Volume ISBN: 0-87014-337-9

Volume URL: <http://www.nber.org/books/whit45-1>

Publication Date: May 1945

Chapter Title: Bank Liquidity in War, 1939-45

Chapter Author: Charles R. Whittlesey

Chapter URL: <http://www.nber.org/chapters/c9929>

Chapter pages in book: (p. 40 - 91)

## Part III

### Bank Liquidity in War, 1939-45

---

The outbreak of war in Europe, and more especially our entry into the war, was followed by an unprecedented demand for currency and other liquid funds.<sup>27</sup> The task of meeting this demand has given rise to problems that are among the most important economic consequences of the war. Its magnitude is indicated by the growth in currency in circulation, bank reserves and till money from the middle of 1939 to the end of 1944, which was considerably greater, relatively, than the increase in such basic productive factors as coal, iron and steel and industrial labor. Adequate provision for the increased monetary requirements was essential to the prosecution of the war and the manner of its financing.

The Board of Governors attested to the major importance of the liquidity problem by announcing on the day after Pearl Harbor that the Federal Reserve System was prepared to take steps to assure an adequate supply of funds for financing the war effort.<sup>28</sup> While the support of the Federal Reserve and other organizations and groups has been indispensable, the responsibility for meeting the expansion in financial requirements has devolved, initially at least, upon the commercial banks of the country; the liquidity problem is peculiarly their problem.

From 1939 to 1945 banks were called upon for additional funds, either for their own use or for the use of others, equal to more than three times the total capital accounts, including capital, surplus, undistributed profits and contingency reserve accounts, of all insured commercial banks in the country at the start of the period. This is a sum considerably larger than their entire cash resources in 1939. Moreover, banks were obliged at the same time to prepare for uncertain requirements during and after the war.

<sup>27</sup> The effect of the expansion in currency and deposits upon the price structure was treated in a previous monograph in this series and is not part of the present study. See C. R. Whittlesey, *The Effect of War on Currency and Deposits* (National Bureau of Economic Research, Financial Research Program, Occasional Paper 11, 1943).

<sup>28</sup> *Federal Reserve Bulletin* (January 1942) p. 2.

An analysis of bank liquidity since 1939 involves a consideration of the factors that created a demand for liquid funds and the sources from which the necessary funds were obtained. By far the most important source since the time we entered the war has been Federal Reserve Bank credit, and the chief instrument for supplying this credit in just the right amounts has been the maintenance of a posted bill rate on Treasury bills. Because of the major role played by Treasury bill policy and also because it is new in this war and hence relatively unknown, it is treated at considerably greater length than other phases of commercial bank or Federal Reserve Bank policy.

The liquidity of the American commercial banking system at the start of the war in Europe was probably greater, as judged by most conventional tests, than ever before in our history. Banks were in a far more liquid condition than in 1929, notwithstanding—indeed, partly because of—the difficulties experienced during the intervening years and the accompanying reduction of 40 percent in the number of active banks.

In the decade from June 1929 to June 1939 deposits of all reporting banks in the United States and possessions had risen by 11.5 percent. Deposits payable on demand had increased more rapidly than time deposits, and constituted 60 percent of total deposits as compared with only 50 percent in 1929.<sup>29</sup> Much more than counterbalancing this increase in the liquidity of liabilities was a great increase in the proportion of liquid assets. Cash and due from other banks had risen from 10.5 percent of total assets in 1929 to 28 percent ten years later. At the same time holdings of United States government securities had increased by 367 percent, from \$4,023 million to \$18,791 million, becoming one of the major categories of earning assets. Meanwhile loans and discounts had fallen by nearly a half, from \$41,433 million to \$21,516 million, and a moderate decline, amounting to about 16 percent, had taken place in "other assets" which consist chiefly of bank premises.

These, then, were the main quantitative features in the liquidity position of banks just before the outbreak of the war in Europe:

- a. A relatively high ratio of demand to time deposits as compared with what had prevailed previously;

<sup>29</sup> If national bank notes in circulation in 1929 are included, the rise in the proportion of the demand obligations of banks is slightly less, i.e., 8.8 instead of 9.9 percent.

- b. A very high ratio of cash and government obligations to total assets;
- c. As judged by the past, a low level of fixed assets and assets in the form of the obligations of private borrowers.

The net result of changes in these elements can be judged only in the light of certain factors in the institutional environment within which banks were operating. The effect of the growth in "cash and due from other banks" in increasing the liquidity of banks was partly offset, for example, by the fact that reserve requirements had been raised by about three-quarters since 1936, with the result that the availability of a part of the increased volume of "cash and due from banks" was reduced.<sup>30</sup> On the other hand, a more liberal policy had been adopted as to the basis for extending Federal Reserve credit. Moreover, the fact that the Federal Reserve Banks had undertaken to maintain an orderly market for government securities served to render bank holdings of Treasury obligations considerably more liquid than they might have been in the

TABLE 5—NET GOLD IMPORTS AND GROWTH IN MEMBER BANK RESERVES, 1934-41<sup>a</sup>  
(in millions)

Year	Net Gold Imports	Increase in Member Bank Reserves
1934	\$1,132	\$1,367
1935	1,739	1,491
1936	1,117	1,019
1937	1,586	421
1938	1,974	1,735
1939	3,574	2,729
1940	4,744	2,373
1941	982	-1,576 <sup>b</sup>

Source: *Federal Reserve Bulletin*.

<sup>a</sup> Figures for imports of gold are not reported since 1941. Some indication of the nature of gold movements is afforded, however, by data on gold assets held by the United States Treasury. As contrasted with increases of \$4,351 million in 1940 and \$742 million in 1941, these show decreases of \$10 million in 1942, \$788 million in 1943 and \$1,319 million in 1944.

<sup>b</sup> Decrease.

<sup>30</sup> Correspondent balances which are included in "cash and due from banks" do not constitute a net resource for the banking system as a whole. They may, however, be highly important to the liquidity of individual banks.

absence of such a policy. This policy tended to counterbalance the effect of the lengthening that had taken place in the average maturity of banks' earning assets, a change that might otherwise have led to a reduction in liquidity.

Looking further afield, the cyclical position of business in the second half of 1939 was favorable to the maintenance of bank liquidity. With economic activity on an upswing, prices firm, orders pouring in from abroad and with the prospect of participation in the war still rather remote from the United States, the immediate business outlook was generally good. The international financial situation was characterized by a rising flood of gold to this country. The heavy gold inflow of 1934 and subsequent years was given added impetus by the political uncertainty abroad that preceded the declaration of war. For the most part, the proceeds of these imports of gold were deposited in commercial banks; they increased bank reserves and at the same time enabled banks to meet the growing demand for currency in circulation (see Table 5).

The institutional framework of banking had been strengthened a few years earlier by the establishment of the Federal Deposit Insurance Corporation. The protection thereby afforded small and medium depositors by the FDIC may serve to retard, to some extent, any tendency for deposits to be converted suddenly into cash. Moreover, the influx of gold that contributed to the liquidity of the member banks had likewise added to the cash resources of the Federal Reserve Banks. Against note and deposit liabilities of \$16,212 million at the end of June 1939 the twelve Federal Reserve Banks held cash reserves of \$13,874 million. The corresponding totals in 1929 were \$4,132 million and \$3,030 million. With cash reserves of 86 percent against combined note and deposit liabilities, the Federal Reserve Banks, like the commercial banks, were more liquid in June 1939 than they had ever been before.

#### LIQUIDITY REQUIREMENTS, 1939-44

The first problem that arose in meeting the liquidity requirements of the war period was to prevent a decline in the price of securities of types found in bank portfolios.

#### SECURITY MARKETS AND THE OUTBREAK OF WAR

The immediate effect of the outbreak of war in Europe was a sharp

decline in bond prices. During the week ending September 6, 1939, the index of United States government bond price fell from 107.3 to 103.2 and two weeks later was down to 100.8<sup>31</sup>. The yield on Treasury bonds, which had averaged 2.13 percent in June, jumped from 2.27 percent in the week ending August 26 to 2.74 percent four weeks later, and similar changes occurred in the yield on municipal and high-grade corporate bonds. Prices of common stocks, in contrast, rose almost as sharply as bond prices fell.

Security markets were again upset by the events of December 1941, but with certain conspicuous differences. The decline in Treasury bond prices was considerably less than in 1939, from an index of 112.1 in the week ending December 6, 1941 to 110.5 a week later and 109.9 in the week of December 27. The fall in the price of municipal bonds was about the same as it had been in 1939, but common stocks, which previously had risen about 15 percent within a period of three weeks declined over 10 percent in the same length of time following Pearl Harbor. The yield on Treasury bonds rose from 1.87 percent, which was very near their low point up to that time, to 2.02 percent three weeks later; the yield on municipal bonds rose from 1.91 to 2.32 percent. The effect of these differences was to widen very markedly the spread in yields between Treasury bonds and municipal and high-grade corporate obligations.

In both periods the break in security prices was largely influenced by the recollection of past effects of war on interest rates and security prices; and in both instances the temporary weakness was met by action by the Federal Reserve officials. In the two weeks ending September 13, 1939 the Federal Reserve Banks increased their holdings of Treasury securities by \$400 million. During the ensuing weeks there was gradual recovery in the bond market and by the end of the year security prices, yields and the volume of Federal Reserve holdings of Treasury issues were not far from what they had been shortly before the outbreak of war.

Following Pearl Harbor, the Federal Reserve officials took additional steps to prevent unnecessary disturbance in the security market. The very next day the Board of Governors announced that, "The system is prepared to use its powers to assure that an

<sup>31</sup> The decline in prices of securities held by banks tended to impair to that extent the liquidity of bank assets.

ample supply of funds is available at all times for financing the war effort and to exert its influence toward maintaining conditions in the United States Government security market that are satisfactory from the standpoint of the Government's requirements." <sup>32</sup>

For almost exactly a year prior to Pearl Harbor, the total of Treasury securities held by the Federal Reserve Banks had remained constant at \$2,184 million. The increase during the course of the month that followed amounted to about \$70 million. The relative stability in prices of Treasury securities as compared with municipal bonds and corporate stocks is partly a reflection of confidence in the ability of the Reserve officials to maintain orderly conditions in the government bond market.

#### BANK RESERVES AND CURRENCY

The preservation of stability in the security markets was of relatively minor importance compared with the problem of meeting the demand for additional funds. The two factors responsible for the bulk of the increase in cash required from or by banks were the growth in volume of currency in circulation and the expansion of bank deposits. The first called for the direct provision of cash in the form of coins and currency, while the second increased the volume of required reserves. A certain additional amount of liquid funds found its way into use as vault cash. More recently the withdrawal of gold either for earmarking or export, has assumed substantial proportions.

The absorption of liquid funds attributable to each of these factors is shown in Table 6 at semi-annual intervals from the middle of 1939 to June 1944. Since the second half of 1940, the dominant factor has been the growth in the volume of currency in circulation. Out of the total increase of \$20,989 million in the five years, 70.8 percent was the result of the expansion of currency in circulation, 27.1 percent of the growth in required reserves, and 2.1 percent of the increase in vault cash. The disproportionate increase in the amount of required reserves in the second half of 1941 was chiefly the result of the rise in legal reserve ratios on November 1, which increased requirements by about \$1.2 billion.<sup>33</sup>

<sup>32</sup> *Federal Reserve Bulletin* (January 1942) p. 2.

<sup>33</sup> With this exception the growth in required reserves was due to the larger volume

## REGIONAL DIFFERENCES

A further element in the liquidity needs of banks was related not to the total demand for liquid funds, but to regional shifts within

TABLE 6—PRINCIPAL FACTORS IN THE INCREASE IN DEMAND BY BANKS FOR LIQUID FUNDS, SEMI-ANNUALLY FROM JUNE 1939 TO JUNE 1944  
(in millions)

Increase or Decrease (-)	Currency Outside Banks	Required Reserves	Vault Cash	Total Increase	
				6-Month Period	Cumulative from June '39
Total, June 1939	\$6,005	\$5,878	\$712	..	..
1939 - December	396	566	129	\$1,091	\$1,091
1940 - June	298	480	-52	726	1,817
December	626	487	202	1,315	3,132
1941 - June	879	430	8	1,317	4,449
December	1,411	1,524	88	3,023	7,472
1942 - June	1,321	578	-65	1,834	9,306
December	3,010	1,186	-3	4,193	13,499
1943 - June	1,868	-256	123	1,735	15,234
December	3,023	777	-10	3,790	19,024
1944 - June	2,044	-90	11	1,965	20,989
Total, June 1944	\$20,881	\$11,560	\$1,143	..	..
Increase, June 1939 to June 1944	\$14,876	\$5,682	\$431	..	\$20,989

Source: *Federal Reserve Bulletin*.

that total. It was the phenomenon of a shortage of funds in some areas accompanied by a surplus in other areas. Such inequalities were largely the result of differences in the rate of Treasury receipts and disbursements within particular areas. On balance, for exam-

of deposits. The action of the Reserve authorities in raising the ratio of required reserves in 1941 was taken after a year of more or less steady decline in excess reserves, which had reduced their amount by \$1,750 million. The inflow of gold that had been chiefly responsible for the growth in reserves had virtually ceased, while the business expansion associated with the war in Europe and our own defense program had caused a rising demand for currency and bank reserves. The action to increase reserve requirements might seem inconsistent with these conditions and with the steps taken not many months later to ease reserves; it was a reflection of the general feeling at the time that pent-up forces of inflation were in greater danger of bursting forth than before. This feeling was doubtless encouraged by the fact that commodity prices, particularly of agricultural products, had been rising rather sharply through the year. The rise in the index of wholesale prices slowed down following the increase in reserve requirements, but the upward movement of agricultural prices, although checked, began again a little later.

ple, the Treasury was withdrawing funds from New York and Chicago and certain other financial centers and pouring out funds in areas where the growth in payments to defense industries and agriculture was particularly large.

The drain of funds away from New York in 1941 was no new phenomenon. During 1934-36 there had been a heavy, and during 1937-39 a moderate, outflow of funds on Treasury account from the New York Federal Reserve District. In the first period this outward movement was compensated by the import of gold plus a movement of business deposits and bankers' balances into the District. In the second period it was much more than offset by the inflow of gold alone.<sup>34</sup> While the expansion in the scale of Treasury operations after the start of heavy war financing in 1942 was partly responsible for the drain of reserves away from New York and Chicago, another contributing factor was the drying up of sources that had previously provided an offset to the withdrawal of funds by the Treasury.

Differences in the net requirement for liquid funds led to changes in the relative reserve position of central reserve city banks. In June 1939 the central reserve city banks in New York and Chicago held \$2,756 million or 65 percent out of a total of \$4,246 million of excess reserves in the System. For a number of years a high proportion of total member bank excess reserves had been held by central reserve city banks in New York City. Beginning in April 1941 their share fell from 48 percent of the total to 21 percent by the middle of 1942. During the same period excess reserves of member banks outside New York and Chicago remained practically stable in amount, notwithstanding an increase in the amount of their required reserves. A little later the withdrawal of correspondent balances, which had assumed something of the character of first-line reserves for interior banks, helped to bring about a virtual disappearance of the excess reserves of central reserve city banks in New York.<sup>35</sup>

One effect of changes in the flow of liquid funds between regions

<sup>34</sup> *Federal Reserve Bulletin* (September 1939) p. 711.

<sup>35</sup> There was a considerable shifting about of interbank deposits from 1940 to 1944. While the total of interbank balances rose during most of the period, balances with New York banks declined substantially and balances with Chicago banks rose only slightly. Deposits with reserve city banks and country banks increased materially and were still rising in 1944. The net effect of these changes was a certain decentralization of interbank deposits. The following tabulation shows the volume (in millions) and

was to cause differences in the behavior of the reserve ratios of the various Federal Reserve Banks. In June 1939 the ratio of reserves to total note and deposit liabilities of all twelve Federal Reserve

**TABLE 7—RATIO OF RESERVES TO NOTE AND DEPOSIT LIABILITIES—  
FEDERAL RESERVE BANKS, JUNE 1939 TO DECEMBER 1944\***

<i>Reserve Bank</i>	<i>June 1939</i>	<i>Dec. 1940</i>	<i>Dec. 1941</i>	<i>Dec. 1942</i>	<i>Dec. 1943</i>	<i>Dec. 1944</i>
Boston	81.6%	89.2%	87.5%	72.0%	56.9%	45.1%
New York	91.1	94.4	93.8	80.2	66.0	48.3
Philadelphia	79.4	86.6	89.1	72.2	55.2	44.7
Cleveland	78.6	86.9	88.9	75.7	53.7	43.9
Richmond	73.9	83.3	85.2	70.4	61.3	44.8
Atlanta	72.3	82.8	86.0	73.3	60.1	49.5
Chicago	90.4	93.1	92.8	80.1	72.7	55.5
St. Louis	75.9	84.9	85.5	71.0	55.3	45.0
Minneapolis	78.4	84.1	86.0	75.6	51.6	45.6
Kansas City	73.3	80.3	85.3	69.0	55.2	44.8
Dallas	71.0	78.7	85.5	69.7	48.8	45.0
San Francisco	80.3	86.9	89.3	74.7	65.9	54.9
<b>ALL RESERVE BANKS</b>	<b>85.7%</b>	<b>90.8%</b>	<b>90.8%</b>	<b>76.3%</b>	<b>62.6%</b>	<b>48.9%</b>

Source: *Federal Reserve Bulletin*.

\* Data for end of month except for 1944 which are for December 27.

Banks averaged 86 percent, ranging from a low of 71 percent for the Dallas Federal Reserve Bank to a high of 91 percent for the Federal Reserve Bank of New York (Table 7). In December 1941, at the end of the period of heavy importation of gold, reserves for all Banks averaged 91 percent with a range of from 85 in the Kansas City and Richmond Reserve Banks to 94 in the New York Bank. In 1942 and 1943, at the very time when the central reserve city

<i>June 30</i>	<i>distribution of domestic interbank demand deposits from June 1939 to June 1944.</i>				
	<i>Total</i>	<i>New York</i>	<i>Chicago</i>	<i>Reserve City Banks</i>	<i>Country Banks</i>
1939	\$7,097	\$2,992	\$746	\$2,920	\$439
1940	8,852	3,840	949	3,526	538
1941	9,610	3,948	1,010	4,000	652
1942	9,110	3,284	1,028	4,052	747
1943	9,648	2,939	1,032	4,749	928
1944	9,904	3,105	1,090	4,757	951

Source: *Federal Reserve Bulletin*.

member banks in New York and Chicago were experiencing difficulty in maintaining adequate reserves, the reserve ratios of the Federal Reserve Banks in New York and Chicago were the highest of the twelve Banks in the System. At the end of 1943 the Dallas Bank held reserves of 49 percent and the Chicago Bank 73 percent, as compared with an average of 63 percent for the twelve Banks of the System. A year later the spread was from 44 percent at the Cleveland Bank to 56 percent at the Chicago Bank, with an average of 49 percent for all twelve banks.

The explanation of differences in the behavior of reserve ratios among the various Reserve Banks lies in changes in liabilities quite as much as in reserves, as is indicated by Table 8 showing the distribution of reserves and note and deposit liabilities by absolute amounts for each of the twelve Federal Reserve Banks. Between December 1940 and December 1943 the reserves of all the Federal Reserve Banks except Boston and New York increased; at the Atlanta and San Francisco Banks they more than doubled; and in the case of the Chicago Bank they increased by over 30 percent. During 1944 total reserves dropped 7 percent and there was a particularly sharp reduction in the reserves of the New York Federal Reserve Bank; but for most Banks changes in reserves were less than in the preceding year. For the different banks individually as well as collectively, the increase in liabilities has been much greater than the increase in reserves. The rate of increase was greatest for the Atlanta, Dallas, Richmond and San Francisco Banks, which also showed the greatest relative increase in reserves. While the note and deposit liabilities of the Chicago Federal Reserve Bank increased a little more than the average, those of the New York Bank actually decreased. By and large, therefore, it was not the increase in reserves but the failure of liabilities to rise as rapidly as elsewhere that caused the reserve ratios in New York and Chicago to remain relatively high for so long a time. In the same way, the rapid expansion of liabilities explains why the ratio of reserves in certain other Federal Reserve Banks continued to fall despite a substantial increase in reserves.

Variations were also substantial among different categories of member banks. On the average, the rate of growth in deposits was greatest for country banks and least for central reserve city banks. This was particularly noticeable from 1941 on. The relative

TABLE 8—RESERVES AND NOTE AND DEPOSIT LIABILITIES OF  
FEDERAL RESERVE BANKS, JUNE 1939 TO DECEMBER 1944<sup>a</sup>  
(in millions)

Reserve Bank	Reserves						Note and Deposit Liabilities					
	June 1939	Dec. 1940	Dec. 1941	Dec. 1942	Dec. 1943	Dec. 1944	June 1939	Dec. 1940	Dec. 1941	Dec. 1942	Dec. 1943	Dec. 1944
Boston	\$772	\$1,164	\$1,192	\$1,214	\$1,078	\$990	\$946	\$1,305	\$1,360	\$1,687	\$1,895	\$2,195
New York	6,515	9,810	8,212	6,990	6,001	4,956	7,149	10,391	8,753	8,645	9,088	10,250
Philadelphia	710	1,066	1,245	1,174	1,078	1,044	894	1,231	1,397	1,625	1,953	2,331
Cleveland	858	1,352	1,652	1,760	1,451	1,404	1,091	1,555	1,857	2,326	2,703	3,200
Richmond	368	573	806	976	1,078	998	498	688	946	1,387	1,760	2,228
Atlanta	290	404	569	789	932	966	401	488	662	1,077	1,552	1,949
Chicago	2,350	2,937	3,464	3,612	3,869	3,489	2,600	3,156	3,734	4,507	5,321	6,290
St. Louis	369	511	650	745	679	695	486	602	761	1,050	1,228	1,544
Minneapolis	262	318	400	486	384	398	334	378	465	643	744	871
Kansas City	348	436	570	674	695	677	475	543	668	977	1,258	1,512
Dallas	228	295	429	538	490	554	321	375	502	772	1,004	1,232
San Francisco	812	1,168	1,576	2,010	2,361	2,520	1,011	1,344	1,765	2,692	3,582	4,593
<b>ALL RESERVE BANKS</b>	<b>\$13,881</b>	<b>\$20,036</b>	<b>\$20,764</b>	<b>\$20,908</b>	<b>\$20,096</b>	<b>\$18,691</b>	<b>\$16,204</b>	<b>\$22,058</b>	<b>\$22,870</b>	<b>\$27,387</b>	<b>\$32,087</b>	<b>\$38,196</b>

Source: *Federal Reserve Bulletin*.

<sup>a</sup> Figures for end of month except for 1944 which are for December 27.

changes in reserve requirements for different classes of banks are shown in Table 9. For the entire period from June 1939 to December 1944 the increase in required reserves amounted to \$7,045 million, distributed among the different classes of banks as follows (in millions):

Central reserve city banks	\$1,415
Reserve city banks	3,511
Country banks	2,119

Compared with the start of the period, the increase in requirements was 44 percent for central reserve city banks, 197 percent for reserve city banks, and 244 percent for country banks.

Differences in the need for cash funds were substantial within individual districts as well as between districts. For example, while the central reserve city banks in the Chicago Federal Reserve District were subject to a steady drain, other banks in the District, especially country banks and the reserve city banks in Detroit, were experiencing large gains. This was reflected in a growth of only 71 percent in deposits of central reserve city banks in Chicago from

TABLE 9—MEMBER BANK RESERVE REQUIREMENTS, 1939-44  
(dollar figures in millions)

	Central Reserve City Banks		Reserve City Banks		Country Banks	
	Amount	Percent Increase	Amount	Percent Increase	Amount	Percent Increase
1939 — June	\$3,187	..	\$1,784	..	\$668	..
December	3,613	13.4%	1,953	9.5%	897	3.3%
1940 — June	3,981	10.2	2,013	3.1	906	1.0
December	4,220	6.0	2,208	9.7	974	7.5
1941 — June	4,441	5.2	2,364	7.1	1,045	7.3
December	5,001	12.6	3,014	27.5	1,406	34.5
1942 — June	5,193	3.8	3,216	6.7	1,511	7.5
December	4,729	-8.9	4,102	27.5	1,946	28.8
1943 — June	4,288	-9.3	4,394	7.1	2,150	10.5
December	4,405	2.7	4,781	8.8	2,516	17.0
1944 — June	4,712	7.0	5,027	5.1	2,698	7.2
December	4,602	-2.3	5,295	5.3	2,987	10.7
Increase, June 1939 to December 1944	1,415	44.4	3,511	196.8	2,119	244.1

Source: *Federal Reserve Bulletin*. Totals are monthly averages of daily figures.

June 1940 to June 1944, at a time when deposits of reserve city banks in Detroit were increasing by 169 percent. Marked differences occurred even within states. Thus banks in Wichita were near the top and banks in Topeka not far from the bottom of the list of all reserve cities as regards relative growth in volume of deposits between 1940 and 1944.

#### HOW LIQUIDITY WAS FURNISHED, 1939-44

The means by which liquid funds may be provided can be classified as those that are primarily automatic and those that are administrative or legislative. The first category includes the activation of cash balances previously held idle and increases in gold and other reserve money. The second comprises chiefly the creation of Reserve Bank credit. It may also include measures such as the Treasury might introduce to provide additional money, changes in the ratio of reserves that banks are required to maintain against deposits and means employed by the banks themselves to maintain liquidity. Broadly speaking, the automatic factors were predominant in the early years of war expansion, while the administrative and legislative factors have been of chief importance since our own heavy war financing began in the spring of 1942. The principal sources of the funds required by banks were imports of gold from abroad from 1939 to the end of 1940, the using up of accumulated excess reserves from early 1941 to the late spring of 1942, and the expansion of Reserve Bank credit from that time onward. Imports of gold had been large each year starting with 1934. Although the net import of nearly \$2 billion in 1938 was a record up to that time, that figure was soon far surpassed. Partly in consequence of the threat of war and then of the war itself, imports of gold rose to \$3.6 billion in 1939 and \$4.7 billion in 1940.<sup>36</sup> The inflow of gold was so great that excess reserves climbed steadily, despite a substantial increase in the absorption of cash, particularly through the expansion of currency and reserves held against deposits. Where excess reserves had amounted to \$4.2 billion at the end of June 1939, they averaged more than \$6 billion in the second half of 1940, and at one time reached almost \$7 billion.

The movement of excess reserves from 1937 to 1943 was

<sup>36</sup> See Table 1 above.

marked by a curious symmetry. For about three years from the middle of 1937 to the middle of 1940, excess reserves increased virtually without interruption, rising in that time from under \$1 billion to over \$6 billion. For nearly three years, from the beginning of 1941 until the end of 1943, excess reserves declined, with hardly a pause, to approximately the point from which they had started six years before.<sup>37</sup> The first year and a half of the downward movement (from the start of 1941 to the middle of 1942) was the most precipitate, with a decrease in excess reserves of \$4.1 billion. Thus out of a net absorption of \$6.2 billion<sup>38</sup> of currency and reserves in the period from early 1941 to the middle of 1942, about two-thirds was supplied by drawing down excess reserves.

In the two years from June 1942 to June 1944 the absorption of liquid funds, most of which resulted from the expansion of currency in circulation, totaled \$11,683 million (see Table 6). The increase in currency alone was greater than the total increase in demand for liquid funds during the three years from June 1939 to June 1942. The expansion of currency in circulation took place at a time when relatively little assistance was being afforded by the change in legal reserve requirements, and gold was being withdrawn rather than imported. By far the major source for supplying the unprecedented demand for liquid funds was the increase in Reserve Bank credit, which rose by almost \$17 billion or over 700 percent (from \$2,775 million at the end of June 1942 to \$19,745 million two years later). After the start of heavy war financing about the middle of 1942, therefore, it was principally the Reserve Banks that furnished the additional liquid funds needed by the financial system as a whole.

While the three periods from June 1939 on are clearly defined as to the principal sources of liquid funds, there was a certain amount of overlapping. In the first period, for example, Reserve Bank credit was supplied rather freely when purchases in the open market were made at the outbreak of war in September 1939. It was also beginning to increase appreciably at the end of the second period. In both the first and third periods excess reserves were of some importance in meeting the need for cash, particularly over

<sup>37</sup> This decline was influenced in the earlier period by a reduction in legal requirements, and in the later period first by an increase and then by decreases in legal requirements.

<sup>38</sup> See Table 2 above.

relatively short periods when the demand was primarily of a seasonal character.

In addition certain modifications were made in legal provisions relating to reserve requirements. Following a precedent of the first World War, Treasury deposits with commercial banks arising out of loans to the government were freed from all reserve requirements in April 1943. As a result of this change, required reserves declined sharply at the time of war loan drives when balances were transferred from private to Treasury accounts and rose gradually thereafter until the next war drive (see Chart 7). From August to October 1942, the reserve requirements of central reserve city banks were lowered from 26 to 20 percent. This change contributed substantially to relieving the pressure on New York and Chicago.<sup>39</sup> Another factor acting to provide liquid funds was the issue of small amounts of silver currency and silver certificates. At the end of 1942 and early in 1943, also, something over a half billion dollars of currency was issued in the form of Federal Reserve Bank notes. These additions to the supply of currency were more than counterbalanced by the net reduction in gold stock in 1943 and 1944.

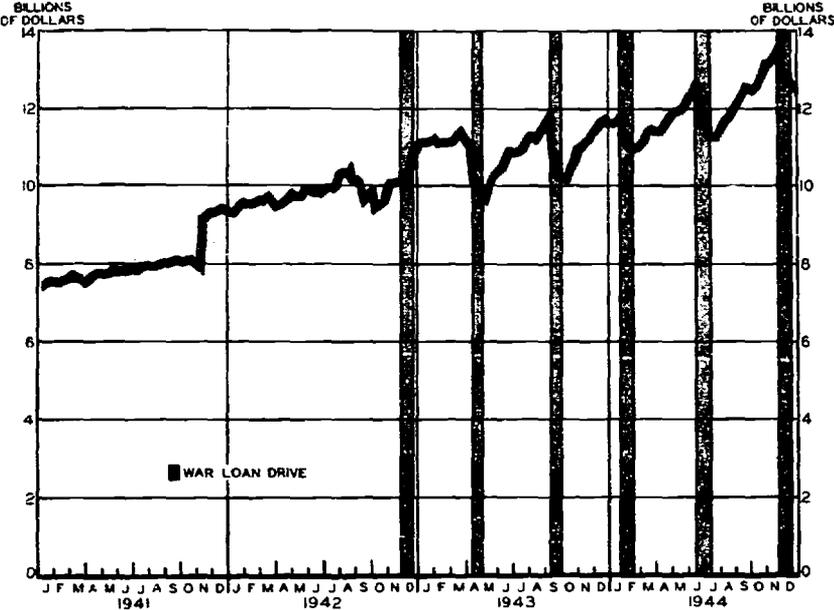
As in the period of expansion during and after the last war, the principal problems arising out of the need for liquid funds were of a regional character. There was again a tendency for certain districts, particularly those in the East, to lose reserves and for others, particularly in the South and West, to gain reserves. In the period of the last war these differences led to extensive borrowing between Federal Reserve Banks, with heavy lending in the opposite direction when the flow of funds reversed itself in the subsequent period

<sup>39</sup> A minor modification in reserve requirements was the adoption in February 1942 of a uniform period of one week for calculating the average reserves of reserve city and central reserve city banks. It was reported that this change would help to overcome the tendency for certain banks to maintain unnecessarily large excess reserves. See Board of Governors of the Federal Reserve System, *Annual Report, 1942*, p. 86.

Somewhat similar reductions in reserve requirements were effected during the first World War. The effect of the introduction of the Federal Reserve System and of changes inaugurated in 1916 was to reduce the reserve requirements of national banks. In 1917 legal reserve requirements of member banks were again lowered, from 18-15-12 percent against demand deposits to 13-10-7 percent. Inasmuch, however, as legal reserves were at the same time redefined to include only deposits with the Federal Reserve Banks, the net result of the changes was to eliminate the larger part of what had previously been counted as reserves. Excess reserves, which had amounted to more than 70 percent of required reserves a few months before, were reduced to a little over 8 percent following the lowering of requirements and the redefinition of legal reserves.

of contraction. No such borrowing between Federal Reserve Banks has occurred in the present war. The reason for this difference is to be found chiefly in the abundance of the reserves held by Reserve Banks when the period of heavy demand commenced. Inequalities in the rate of expansion in different areas resulted in substantial variations in the reserve position of different Federal Reserve Banks. Adjustments in the reserve position of the Banks have been effected in part through the allocation of security purchases among the different Reserve Banks.

**CHART 7—REQUIRED RESERVES OF MEMBER BANKS,  
JANUARY 1941 - DECEMBER 1944**



Source: *Federal Reserve Bulletin*.

**INTERNAL FACTORS RELATED TO BANK LIQUIDITY**

As was pointed out earlier, bank liquidity is correlated directly with the liquidity of a bank's assets and inversely with the liquidity of liabilities. It depends on the extent to which cash can be realized from assets with a minimum of delay and without loss of principal, and on the extent to which liabilities may at any time be pre-

sented for payment in cash. The sources of changes since 1939 in the net liquidity position of banks are to be found, therefore, in the alterations that have occurred in the principal asset and liability items of commercial banks. Some of these changes are internal to the banks and reflect deliberate actions on the part of those responsible for conducting the affairs of banks, while others are the result of influences — including Treasury policy, the preferences of the public and altered business conditions — which lie outside the control of bankers.

During the decade of the twenties time deposits of commercial banks increased more rapidly than adjusted demand deposits. In the early thirties, time deposits declined less than demand deposits with the result that the ratio of time to demand deposits continued to rise, reaching a peak of 94 percent in 1931. Thereafter the movement in the ratio was downward, interrupted by a few minor upward swings. Following the start of heavy war financing, the downward movement was much more pronounced, and by the end of 1944 the ratio was less than a third of what it was in 1931. More recently savings deposits have shown a greater tendency to increase. The relatively rapid growth in time deposits in the twenties was probably abnormal, so that in part the decline in the ratio of time to demand may have represented a readjustment to a more typical relationship.<sup>40</sup> In addition, it was greatly influenced by Treasury borrowing: the return on war savings bonds was higher than that paid on savings deposits, and the small savers who were most accustomed to make use of time deposits were under pressure to purchase war bonds through payroll savings plans or otherwise.

The declining proportion of time to total deposits appears because of the greater stability of time deposits, as a factor operating to diminish bank liquidity. Similarly the rapid growth in large deposits, which are more volatile than smaller deposits, has also tended to reduce bank liquidity. As an offsetting factor, there has recently been a decrease in the ratio of interbank deposits to total deposits. The shrinkage has been most conspicuous since 1941 and, as Table 10 shows, affects all categories of banks. Since interbank deposits are subject to sudden withdrawal, the relative decline in their amount has tended to increase the liquidity of the larger banks, which were the principal holders of interbank deposits, and

<sup>40</sup> Quite a number of banks, also, ceased to offer savings account facilities.

**TABLE 10—RATIO OF INTERBANK DEMAND DEPOSITS TO  
TOTAL DEMAND DEPOSITS, 1928-44**

End of	All Member Banks	Central Reserve City		Reserve City	Country
		New York	Chicago		
1928	16.3%	18.4%	22.3%	21.1%	6.3%
1929	16.4	18.8	23.0	20.7	6.3
1930	18.8	21.8	25.4	23.4	6.7
1931	16.7	19.0	24.8	20.3	6.2
1932	21.2	26.3	23.8	24.8	6.6
1933	18.1	20.1	20.0	22.8	6.6
1934	19.7	21.7	25.2	24.1	6.9
1935	21.9	26.7	24.4	25.1	7.1
1936	21.4	25.9	25.3	25.2	6.9
1937	20.1	25.2	24.4	23.3	6.1
1938	22.0	28.4	26.1	24.8	6.3
1939	24.7	30.7	31.3	27.4	7.3
1940	23.3	27.6	31.4	26.5	7.1
1941	21.1	24.5	28.9	25.0	7.1
1942	16.7	18.5	24.4	20.7	6.0
1943	13.6	16.4	19.6	16.7	4.9
1944a	13.2	15.4	19.9	16.8	4.8

Source: For the years 1928-41, *Banking and Monetary Statistics*, pp. 78 ff.; for the years 1942-44, *Member Bank Call Reports*.

a Average of daily figures.

to decrease the liquidity of the smaller banks owning the deposits.

All available evidence indicates that the activity of deposits has slowed down almost continuously since 1929. Despite a temporary rise in the rate of turnover of demand deposits in 1941, by 1944 the rate was approximately 40 percent of what it was for the year 1929. While liquidity depends less on the total activity or inactivity of deposit balances than on the extent to which withdrawals coincide with the inflow of funds, the slowing down in deposit turnover is generally viewed as contributing to a more liquid condition.

The influence of the deposit changes mentioned is somewhat diverse, but the general tendency seems to be in the direction of an increase in the liquidity of deposits and therefore toward an impairment of over-all bank liquidity. This tendency appears, however, to be greatly outweighed by changes in the assets of banks, which, in contrast to changes in deposits, are largely influenced by the policies of bank executives.

The proportion of cash holdings to deposits of member banks has

declined since the early years of the war (Table 11). At the end of June 1944 the total of cash and due from banks was approximately the same ratio of deposits as in June 1933. The decrease in the ratio of cash to deposits since the end of 1940 has been accompanied by an increase in bank holdings of Treasury bills and certificates of indebtedness which are, for reasons explained below, almost as

TABLE 11—RATIO OF CASH AND TREASURY BILLS TO TOTAL DEPOSITS IN MEMBER BANKS, JUNE 1939 TO JUNE 1944\*

(dollar figures in millions)

	<i>Deposits</i>	<i>Cash Plus Due from Banks</i>	<i>Cash Plus Due from Banks as a % of Deposits</i>	<i>Treasury Bills</i>	<i>Treasury Bills as a % of Deposits</i>
1939 — June	\$45,873	\$17,629	38.4%	\$441	1.0%
Dec.	49,340	19,782	40.1	563	1.1
1940 — June	51,729	21,830	42.2	797	1.5
Dec.	56,429	23,963	42.5	652	1.2
1941 — June	58,511	22,689	38.8	1,127	1.9
Dec.	61,717	23,122	37.5	971	1.6
1942 — June	63,404	21,722	34.3	1,509	2.4
				(3,381)	(5.3)
Dec.	78,277	24,280	31.0	4,363	5.6
				(10,648)	(13.6)
1943 — June	84,016	22,310	26.6	6,278	7.5
				(15,696)	(18.7)
Dec.	92,262	23,790	25.8	4,360	4.7
				(16,431)	(17.8)
1944 — June	101,276	23,797	23.5	4,466	4.4
				(18,694)	(18.5)

Source: *Member Bank Call Reports*.

\* Figures in parentheses include certificates of indebtedness.

liquid as cash. The shift from cash to Treasury bills and certificates was encouraged by pressure upon bankers by Treasury and Reserve officials to utilize excess reserves. From an operational standpoint Treasury bills, and to some extent certificates, now perform much the same function as excess reserves.<sup>41</sup>

<sup>41</sup> The virtual disappearance of excess reserves in the financial centers has led to some borrowing at Reserve Banks and to a minor revival of dealings in "federal funds" for facilitating adjustments in the liquidity position of banks. During the twenties the latter operations were fairly important among banks in the principal money centers, but they practically ceased as a result of the emergence of large excess reserves. For details see B. H. Beckhart and J. G. Smith, *The New York Money Market*, Vol. 2 (New York, 1933) pp. 40-48; and Bernice C. Turner, *The Federal Funds Market* (New York, 1931).

The growth in holdings of Treasury bills and certificates has largely compensated for the failure of cash assets to keep pace with the growth in deposits. When allowance is made for the expansion in bank holdings of other Treasury obligations, which at present are hardly less liquid than certificates of indebtedness, it seems clear that bank assets as a whole have become increasingly liquid since 1941.

Further evidence pointing in the same direction is obtainable from reports of the FDIC, showing the percentage of total assets of all insured commercial banks which were listed as substandard in quality. As may be seen from Table 12, a marked decline in the proportion of substandard assets occurred after 1939. While the improvement was substantial in all size classes it was somewhat greater for very large banks than for smaller banks from 1939 to 1942, and slightly less in 1943. In general, there is an inverse correlation between size of bank and proportion of substandard assets. For all classes of banks, also, there was a decline in the ratio of substandard assets to capital accounts.

The decline in the proportion of substandard assets reflects steps

TABLE 12—RATIO OF SUBSTANDARD ASSETS TO TOTAL ASSETS OF INSURED COMMERCIAL BANKS, 1939-43<sup>a</sup>  
(dollar figures in thousands)

<i>Banks With Deposits of</i>	1939	1940	1941	1942	1943
\$100 or less	11.56%	8.90%	7.69%	5.79%	} 2.57%
100 - 250	8.81	6.95	5.43	4.21	
250 - 500	7.46	5.88	4.53	3.18	1.95
500 - 1,000	7.21	5.85	4.48	3.13	1.77
1,000 - 2,000	7.55	6.04	4.67	3.36	1.87
2,000 - 5,000	7.35	6.31	4.73	3.51	1.92
5,000 - 10,000	6.63	5.57	4.27	3.30	1.86
10,000 - 50,000	5.69	4.42	3.34	2.56	1.49
More than 50,000	3.84	2.86	1.99	1.54	.94
ALL BANKS	5.10%	3.92%	2.83%	2.13%	1.24%

Source: Federal Deposit Insurance Corporation, *Annual Reports*.

<sup>a</sup> Total assets and substandard assets for all banks were as follows (in billions of dollars):

	1939	1940	1941	1942	1943
Total	\$58.25	\$65.18	\$71.70	\$80.45	\$102.02
Substandard	2.97	2.55	2.03	1.71	1.26

taken to get rid of inferior assets and to supervise credit extension more carefully. The absolute amount of substandard assets fell from nearly three billion dollars in 1939 to a billion and a quarter four years later. The effect of the disproportionate increase in bank holdings of Treasury securities, which are never shown as substandard, was to improve the average showing of the entire portfolio.

The liquidity of bank assets is ordinarily assumed to be inverse

TABLE 13—AVERAGE MATURITY OF ASSETS OF INSURED COMMERCIAL BANKS, JUNE 1939 TO JUNE 1944<sup>a</sup>

<i>End of</i>	<i>Months to Maturity</i>	<i>End of</i>	<i>Months to Maturity</i>
1939 – June	50.8	1942 – June	49.0
Dec.	47.4	Dec.	43.6
1940 – June	44.9	1943 – June	44.4
Dec.	43.6	Dec.	42.6
1941 – June	45.2	1944 – June	41.8
Dec.	47.0		

<sup>a</sup> Assets classified by maturity with dollar values multiplied by mid-point between maturity extremes, maturity distribution for all investments available December 1938 to June 1942; subsequently only government obligations are listed. The proportion of term loans to commercial and industrial loans following 1940 has been assumed to be the same as of that year; other loans and miscellaneous assets less than one year maturity. Assets, Federal Deposit Insurance Corporation. *Reports*; time weights for term loans, Neil H. Jacoby and R. J. Saulnier. *Term Lending to Business* (National Bureau of Economic Research, Financial Research Program, 1942) p. 139; for real estate loans, Federal Housing Administration, *Reports*.

to their maturity. On the basis of generalized assumptions concerning securities in particular categories, it appears that the average time to maturity of all earning assets of insured banks declined irregularly from 50.8 months in June 1939 to 41.8 months in June 1944 (see Table 13). Since the portfolios of commercial banks are increasingly dominated by Treasury obligations, the distribution by maturity of United States government securities held by banks is of particular importance to the over-all question of maturity of assets.

Changes in the maturity distribution of Treasury obligations held by member banks during the period from June 1939 to June 1944 are shown in Table 14. At the start roughly similar amounts were held in the three categories of Treasury obligations of 1 to 5, 5 to 10 and 10 to 20 years' maturity. Smaller amounts were held

in securities maturing in less than 1 and in more than 20 years. For a time after the outbreak of war in Europe there was an increasing concentration in securities maturing in from 10 to 20 years. From the end of 1941 on there was a steady decline in the proportion of assets maturing in more than 10 years and a rise in the proportion of each category of securities maturing in less than 10 years. In part this was a reflection of the restrictions placed upon banks' acquiring longer-term Treasury securities. The effect was to decrease materially the proportion of long-term Treasury obligations held by banks, both relative to total bank holdings and relative to total Treasury issues of these types.

**TABLE 14—PROPORTION OF TREASURY OBLIGATIONS IN DIFFERENT MATURITY CLASSIFICATIONS HELD BY MEMBER BANKS, JUNE 1939 TO JUNE 1944**

<i>End of</i>	<i>Within 1 Year</i>	<i>1-5 Years</i>	<i>5-10 Years</i>	<i>10-20 Years</i>	<i>Over 20 Years</i>
1939 — June	4.0%	32.0%	25.8%	26.4%	11.8%
Dec.	5.0	26.8	27.0	32.7	8.5
1940 — June	6.9	27.8	27.6	32.5	5.2
Dec.	5.3	32.1	23.4	35.2	4.0
1941 — June	7.9	28.2	24.8	35.6	3.5
Dec.	6.2	28.4	23.3	34.7	7.4
1942 — June	15.8	24.9	23.1	30.9	5.2
Dec.	30.4	23.5	25.9	16.9	3.2
1943 — June	35.3	23.5	22.3	16.1	2.8
Dec.	32.5	24.4	29.5	11.0	2.7
1944 — June	31.4	27.1	30.0	9.0	2.5

Source: *Member Bank Call Reports.*

In June 1939 over 38 percent of Treasury obligations held by banks had a maturity of 10 years or more. At the end of 1941 over 42 percent were in this group, while by the middle of 1944 the proportion had fallen to 11.5 percent. On the other hand, holdings of Treasury securities maturing in one year or less rose from 4 percent in June 1939 and 6 percent in December 1941 to over 31 percent in June 1944. These shifts constitute the outstanding feature of the strengthened liquidity position of banks.

## FEDERAL RESERVE TECHNIQUES FOR PROVIDING BANKING LIQUIDITY

A central bank has the power to furnish liquidity by creating additional reserves. It is a *deus ex machina* that may provide liquidity after internal resources have ceased to be adequate for the demands made upon them. As long as the central bank is able and willing to furnish cash, either on its own initiative or when called upon by the commercial banks, there can be little question of lack of liquidity for individual banks or for the banking system. The condition of the individual bank may be highly important, however, in influencing the willingness of the central bank to lend. The extent of the assistance afforded by central banks may at times be very large. In 1919 and 1920, for example, the amount of member bank borrowing from Federal Reserve Banks exceeded the total of member bank reserves, so that, in effect, member banks were operating on borrowed reserves. Inasmuch as borrowing from the Federal Reserve was the principal means employed during and after the last war to enable banks to obtain additional liquid funds,<sup>42</sup> it is all the more remarkable that it has scarcely figured in the financial operations of the second World War.

Since the early twenties there has grown up a strong tradition against borrowing by member banks. In part, this tradition may have been a reaction from the excessive reliance upon borrowing at that time.<sup>43</sup> At any rate, it became one of the bases of Federal

<sup>42</sup> See Anna Youngman, *The Federal Reserve System in Wartime* (National Bureau of Economic Research, Financial Research Program, 1945) pp. 28-30.

<sup>43</sup> The prejudice against borrowing was probably influenced by the experience of banks which found themselves pinched by the raising of discount rates in 1920 and again in 1929 at times when they were heavily in debt at the Reserve Banks. Moreover, there was a high correlation between borrowing by banks from 1918 to 1932 and bank failures from 1930 to 1933 (see especially Fred L. Garlock and B. M. Gile, "Bank Failures in Arkansas," Bulletin 315, Agricultural Experiment Station, University of Arkansas, March 1935). While the borrowing that occurred in this period may have been more the result than the cause of the weakness of banks, the connection was too apparent to be missed. The opposition to continuous borrowing is further supported by the consideration, grounded in both logic and experience, that the practice of borrowing in good times may make it more difficult for a bank to borrow in an emergency. This is because of the unfavorable impression likely to be created by continuous borrowing and because the pledging of assets will have reduced the amount of collateral available for use in an emergency. The hostility of depositors to heavy bank borrowing may be based upon the thought that a bank that borrows from other banks or the central bank ordinarily pledges assets of the highest quality, thereby lowering to that extent the average quality of the assets protecting the claims of depositors.

**Reserve operations.** It operated to hasten an automatic contraction of credit when conditions made it possible for banks to repay their loans, and it helped to discourage banks from continuous reliance upon the Reserve Banks. As the tradition grew stronger, it became an obstruction not only to unwarranted borrowing but also to that type of emergency borrowing which a central bank is expected to facilitate. It hindered the Reserve Banks in discharging the function of a lender of last resort, and consequently interfered with the automatic provision of liquidity through the Federal Reserve.

This fact was of little immediate importance as long as excess reserves were so large as to relieve banks of a general need for additional liquid funds. But by the middle of 1942 Treasury borrowing had begun on a large scale and it was apparent that steps must be taken to furnish Reserve Bank credit. The principal methods adopted were open market operations of the traditional type and Treasury bill purchases.<sup>44</sup> The latter will be dealt with at length, since it is the newest, the least known, and currently the most important instrument of Federal Reserve policy.

### 1. *Open Market Operations*

Open market operations have played a major part in the maintenance of bank liquidity since 1939. It is to be observed, however, that this particular instrument of Federal Reserve policy has gone through an especially lengthy process of evolution, which has greatly altered its character. Originally purchases were made in the open market to obtain earning assets for the Reserve Banks.<sup>45</sup> In their second and most familiar stage, open market operations were used to influence the volume of member bank reserves for the purpose of controlling credit.

The third phase began in 1937 when purchases were made to preserve "orderly conditions" in the security market. In commenting on the use of these measures at the outbreak of war in 1939,

<sup>44</sup> Legal reserve requirements were lowered for central reserve city banks in 1942, but since there had been a general increase in 1941 the net contribution of this device to the liquidity of the banking system has been slight. See Youngman, *op. cit.*, pp. 24-28; and C. R. Whittlesey, "Reserve Requirements and the Integration of Credit Policies," *Quarterly Journal of Economics* (August 1944), pp. 553-70.

<sup>45</sup> Open market purchases were also employed to broaden the market for certain types of securities, such as bankers' bills and United States certificates of indebtedness. See Federal Reserve Bank of Boston, *Annual Report, 1921*, p. 15.

the Reserve authorities mentioned two major considerations underlying their action. The first was the desire to exert a steadying influence on the entire capital market, and the second was a feeling that the Federal Reserve System "has a measure of responsibility for safeguarding the large United States Government portfolio of the member banks from unnecessarily wide and violent fluctuations in price."<sup>46</sup>

At that same time the Board of Governors declared that "the System has *neither the obligation nor the power* to assure any given level of prices or yields for Government securities."<sup>47</sup> It is an indication of the rapidity of the changes effected by war that two years after this declaration was published the Reserve authorities discovered that the Federal Reserve System had both the power and the obligation to establish a fixed pattern of yields on government securities. The date of the announcement of this policy, May 1942, marks the start of the fourth phase of open market operations, their use to maintain a fixed pattern of interest rates on Treasury obligations. While the second and third phases have been of some importance since the start of the present war, their origin antedated the war. The fourth phase is entirely the product of the war, and one that has constituted a central feature of the Treasury's policy of war financing.<sup>48</sup>

Open market purchases, whatever their immediate objectives, have affected the liquidity of the banking system in a variety of ways. They have put funds into the market and thereby strengthened the banks' cash position, and they were used to quiet the state of alarm caused by the outbreak of war in Europe, and later in the Pacific. To the extent that this action helped to prevent security prices from declining more than they did, it contributed to increas-

<sup>46</sup> Board of Governors of the Federal Reserve System. *Annual Report, 1939*, p. 5. While the qualifying phrase "unnecessarily wide and violent" may perhaps be regarded as constituting a significant reservation, this declaration provides a possible precedent for future Federal Reserve policy. It may be construed as suggesting that as long as government securities occupy a major place in member bank portfolios the Reserve Banks will feel constrained to promote stability in their market value, a position that was made still more explicit in the *Annual Report* for 1943, p. 29.

<sup>47</sup> *Ibid.*, p. 5. Italics not in the original.

<sup>48</sup> The Federal Reserve Banks' Treasury bill policy, though often classified as one phase of open market operations, is treated separately in this paper. It is to be noted, however, that it played an important role in anchoring the pattern of rates at the lower extremity. Youngman, *op. cit.*, pp. 22-24.

ing the liquidity of banks owning securities whose prices were supported.

The use of open market operations has been of great importance in preserving a stable pattern of interest rates. By this policy the Federal Reserve has rendered Treasury obligations as liquid as cash. As long as the policy is in force, there can hardly be any question, in view of the large amount of such securities held by banks, as to the adequacy of liquid banking assets. For the time being liquidity is assured for the entire system of commercial banks, and presumably for any bank that holds its proportionate share of government securities. A further effect is to render differences in maturity of no immediate significance to the liquidity of government obligations: as long as it is the policy of the Reserve Banks to preserve the established pattern of rates on marketable government securities, the liquidity of all of them is apparently the same. While this policy continues, banks are able to obtain the higher yields available on longer maturities without sacrificing liquidity.<sup>49</sup> This consideration is important for smaller banks whose earnings have been depressed and particularly for banks in the interior which feel that they are likely to be subject to a contraction of deposits and a drain of reserves when the war boom begins to subside.<sup>50</sup>

The possibility that the Reserve Bank policy of stabilizing the market for government securities will be continued is of the utmost importance to the problem of bank liquidity. The disadvantage of announcing permanent stabilization of the market for government securities is apparent: guaranteeing the liquidity of longer-term securities would tend to aggravate the already troublesome problem of maintaining the present differential in yield on longer and shorter maturities. The maintenance of a given schedule of interest rates on Treasury obligations inevitably results in a paradoxical situation. It makes all of the securities fully liquid; but when the securities become equally liquid the schedule of rates ceases to be self-sustaining, and consequently the difficulty of main-

<sup>49</sup> The future of the policy may be decided as much by the Treasury as by the Federal Reserve. Secretary Morgenthau has indicated a determination to preserve the existing pattern of rates. Cf. Treasury Department, Press Release, October 14, 1944.

<sup>50</sup> The reluctance of certain very large banks to rely on sales in the market for liquidity, lest the scale of operations depress the price of the securities offered, involves the tacit assumption that the Federal Reserve either would not be in a position, or would not be willing, to continue to support the market for government securities.

taining it is greatly accentuated. Only as long as there is some doubt concerning the future liquidity of longer-term securities, because of the possibility that the Reserve authorities will abandon its policy, is there an economic basis for differences in rates.

## 2. *Treasury Bill Policy*

Since the start of defense financing, the most distinctive feature of Federal Reserve credit policy, and the chief means of providing additional funds, has been the purchase and sale of Treasury bills at a fixed rate of discount. The introduction of the technique of a fixed buying and selling rate on bills to facilitate the adjustment of the volume of member bank reserves provided virtually a new instrument of Federal Reserve policy. This instrument has characteristics of both discount policy and open market operations as customarily carried on. It originated because it succeeded in overcoming the defects of other methods of regulating the volume of available Reserve Bank credit. The role of Treasury bills is somewhat similar to that performed by bankers' bills during and after the last war.<sup>51</sup>

Toward the end of April 1942, at the time the Treasury announced its plans for the start of heavy war financing, the Open Market Committee of the Federal Reserve established a fixed buying rate on Treasury bills of  $\frac{3}{8}$  percent per annum. The declared purposes in initiating this policy were to stabilize the bill market, effect a broader distribution of bills and facilitate prompt adjustment of bank reserves to changing conditions.<sup>52</sup> Although the volume of excess reserves held in the larger centers had declined sharply during the preceding year, they were still large in most other areas. The establishment of a fixed buying rate on Treasury bills was intended to assure banks that they could purchase bills

<sup>51</sup> During the first World War and in the 1920's, the Federal Reserve Banks stood ready at all times to purchase bankers' bills at the official discount rate. Member banks and dealers made frequent use of the privilege, dealers sometimes selling bills under "repurchase contracts" whereby they bound themselves to buy the bills back within fifteen days. The preferred status given bankers' bills was partly designed to facilitate the wider adoption of this financial instrument. At the same time it helped to provide a means whereby additional Federal Reserve credit could be obtained in time of temporary strain and returned when the emergency was past. See W. Randolph Burgess, *The Reserve Banks and the Money Market*, Revised Edition (New York, 1936) Chapter X, esp. pp. 171-78.

<sup>52</sup> See Board of Governors of the Federal Reserve System, *Annual Report, 1942*, p. 14.

with their excess funds and still be in a position, without risk of loss, to obtain reserves or currency whenever necessary. The primary objective seems to have been to encourage banks, particularly banks outside central reserve cities, to reduce excess reserves.<sup>53</sup> The following August the Open Market Committee directed the Reserve Banks to afford sellers of bills the option of repurchasing a like amount of bills of the same maturity at the established rate.<sup>54</sup> Originally transactions were for delivery, except in case of emergency, on the following full business day. This was modified so that securities were delivered immediately upon completion of a sale.<sup>55</sup> The net result of these various provisions was to render Treasury bills absolutely liquid. They became practically equivalent to excess reserves and were so called and so treated by many bankers, even though legally they were not reserves at all.

The introduction of this technique for providing liquid funds was partly attributable to the circumstances that prevailed at the time. The banks had held excess reserves for nearly a decade and gradually had come to regard a substantial, though usually unspecified, amount of excess reserves as normal and desirable. The Federal Reserve authorities concluded that a reduction in the amount of excess reserves was called for on the grounds, first, that they constituted idle funds which should be at work in the interest of the war effort, and second, that the future control of credit would be facilitated by their absorption. The principal reason for establishing a fixed buying rate on bills, however, was that the expansion of deposits and currency and the shifting of balances from area to area made it necessary that reserve funds should be readily available. This necessity was bound to arise whether or not existing reserves were fully utilized. The adoption of the Treasury bill

<sup>53</sup> *Ibid.*, and *Federal Reserve Bulletin* (July 1942) p. 631.

<sup>54</sup> The same privilege with respect both to the purchase of bills and the repurchase option was accorded individuals, corporations and others. See Board of Governors of the Federal Reserve System, *Annual Report, 1942*. While the changes introduced resulted in a somewhat wider distribution of Treasury bills, the heaviest purchasers continued to be the large money-market banks. By the middle of 1943 excess reserves had been greatly reduced in reserve city banks but remained substantial in country banks. In an effort to encourage larger purchases of Treasury bills by country banks a policy was inaugurated in May 1943 allotting in full, at a price to yield  $\frac{3}{8}$  percent, all subscriptions to Treasury bills amounting to not more than \$100,000, later raised to \$200,000. See *Federal Reserve Bulletin* (June 1943) p. 492. Details relating to the purchase of Treasury bills are given in the *Federal Reserve Bulletin* (July 1942) pp. 631-32.

<sup>55</sup> Board of Governors of the Federal Reserve System, *Annual Report, 1942*, p. 108.

mechanism as the principal means of putting reserves into the market may be traced, briefly, to the fact that it served to accomplish four corollary results:

- a. It made possible the absorption of the great bulk of excess reserves;
- b. At the same time it left banks as liquid as they would have been with an equivalent amount of excess reserves;
- c. By furnishing reserves in the amounts and places needed it helped to make up for the lack of precision and automatism of usual open market operations; and
- d. It provided an instrument more simple and automatic than discounting at a time when that instrument was severely handicapped by the tradition against borrowing.

#### a. *Mechanical Provisions*

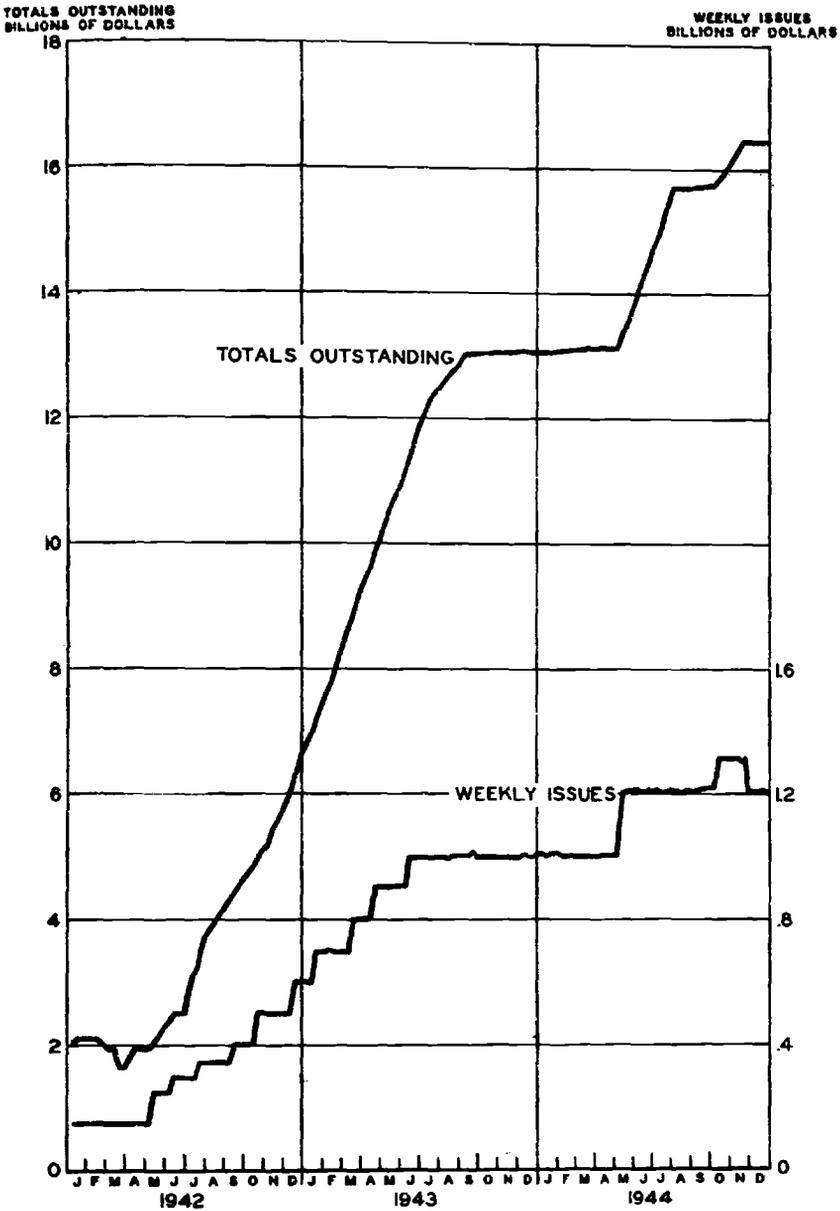
While Treasury bills are obtainable at any time through ordinary trading in the market, the bulk of them are purchased through direct bids publicly solicited by the Secretary of the Treasury. Offerings of bills, generally of three months' maturity, are made each week. Tenders are received by the Reserve Banks or their branches acting for the Treasury, and the bills are issued in denominations with a maturity value of \$1,000, \$5,000, \$10,000, \$100,000, \$500,000 and \$1,000,000. The price bid is the par value less an amount equal to discount to maturity at the rate the bidder is willing to accept. Ordinarily payment is in immediately available funds, but occasionally payment is by credits to war loan deposit accounts. Except for the allotment of \$200,000<sup>56</sup> to any bidder at a fixed price equivalent to a yield of approximately  $\frac{3}{8}$  percent, awards are granted on the basis of the highest bid. A bidder may submit tenders at more than one price, but a separate tender is required at each price.<sup>57</sup>

In order to permit immediate delivery of securities reacquired under the repurchase option, it became necessary to deal with them separately. Instead of keeping them in the "System account," as is the case with bills purchased outright and with securities pur-

<sup>56</sup> Prior to November 30, 1944, the amount that might be allotted in this way was \$100,000.

<sup>57</sup> Treasury Department Circular No. 418 as amended, and *Federal Reserve Bulletin* (July 1942) pp. 631-32.

**CHART 8—TREASURY BILLS, WEEKLY ISSUES AND TOTALS OUTSTANDING, JANUARY 1942 - DECEMBER 1944**



Source: Treasury Bulletin.

chased through ordinary open market operations, Treasury bills subject to the repurchase option are held in the Bank's own account by the individual Reserve Bank making the purchase.<sup>58</sup> Where a member bank leaves Treasury bills with a Federal Reserve Bank for safekeeping, a transfer from Treasury bills to the reserve account, or vice versa, involves little more than notifying the Bank of the member bank's desire to make the shift.

#### b. *Transactions in Treasury Bills, Volume and Yield*

Prior to the establishment of the posted bill rate, the weekly issues of Treasury bills had fluctuated between \$100 and \$200 million (see Chart 8). With the inauguration of the new policy the weekly issue was raised from \$150 to \$250 million. In the course of the following year the amount issued each week was increased to approximately \$900 million and by June 1943 to approximately \$1 billion. It remained at this figure until May 1944 when it was increased to \$1.2 billion, and continued at that level to the end of the year with the exception of a seven week period in October and November when weekly issues amounted to \$1.3 billion.

The total volume of bills outstanding was around \$2 billion at the start of the posted bill policy, and rose gradually from that point to a little over \$13 billion in September 1943. The increase initiated in May 1944 raised the total to over \$16 billion in December.

Throughout most of the year preceding the establishment of the fixed buying rate, the average rate of yield on Treasury bills had been below  $\frac{1}{4}$  percent, much of the time well below. With the authorization of a  $\frac{3}{8}$  percent rate, the average yield at which Treasury bills were sold rose toward this level. At one time a considerable proportion of the bills issued were bought at a price to yield somewhat less than  $\frac{3}{8}$  percent, but the amount of the premium and the proportion of the total issue sold at a premium subsequently decreased and from the middle of 1943 onward the average yield conformed closely to the official rate.

Holdings of Treasury bills by commercial banks and by the Federal Reserve Banks have undergone pronounced changes in both absolute and relative amounts (see Table 15 and Chart 9). At the

<sup>58</sup> Board of Governors of the Federal Reserve System, *Annual Report, 1942*, p. 108.

**TABLE 15—BANK HOLDINGS OF TREASURY BILLS,  
JANUARY 1942 TO NOVEMBER 1944**  
(dollar figures in millions)

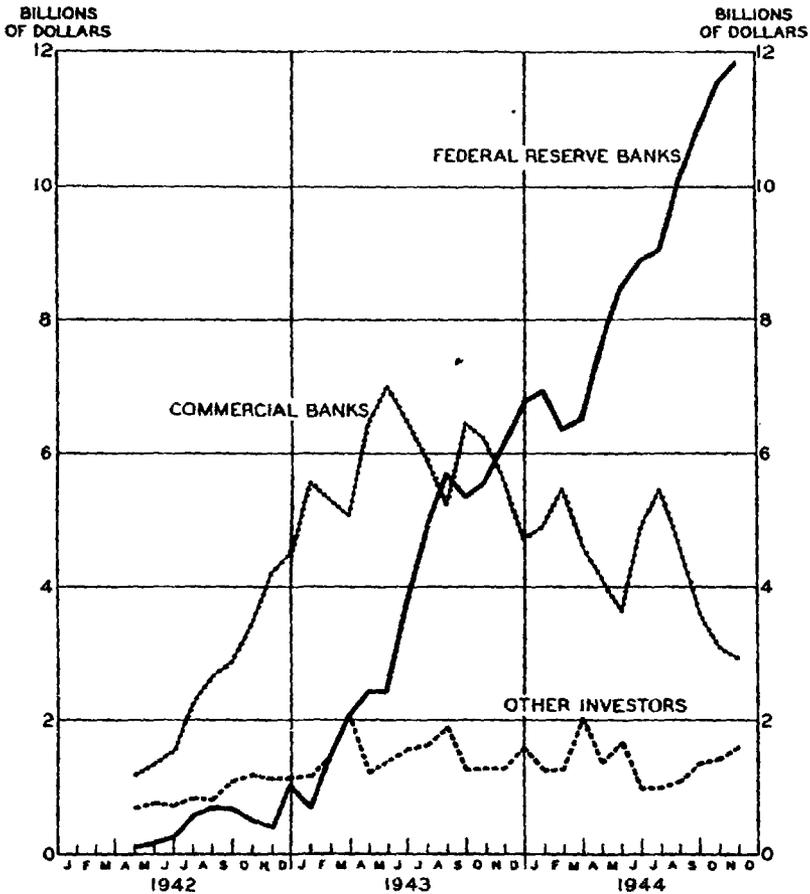
End of	Federal Reserve Banks		Commercial Banks <sup>a</sup>	
	Dollar Volume	% of Total Bills Outstanding	Dollar Volume	% of Total Bills Outstanding
<i>1942</i>				
January	..	..	\$1,428	67.9%
February	..	..	1,292	64.5
March	..	..	710	43.0
April	\$91	4.7%	1,191	61.0
May	156	6.9	1,350	59.8
June	244	9.7	1,557	62.1
July	566	15.5	2,263	61.8
August	696	16.7	2,648	63.5
September	657	14.2	2,884	62.4
October	481	9.4	3,468	67.7
November	383	6.7	4,216	73.7
December	1,010	15.2	4,497	67.9
<i>1943</i>				
January	689	9.3	5,568	75.0
February	1,475	17.9	5,302	64.4
March	2,087	22.6	5,069	54.9
April	2,430	24.2	6,415	63.9
May	2,442	22.5	7,017	64.7
June	3,815	32.2	6,502	54.8
July	4,896	39.3	5,939	47.7
August	5,701	44.4	5,233	40.7
September	5,351	41.0	6,448	49.4
October	5,547	42.5	6,227	47.7
November	6,163	47.1	5,643	43.2
December	6,768	51.8	4,716	36.1
<i>1944</i>				
January	6,941	53.0	4,904	37.4
February	6,354	48.5	5,484	41.8
March	6,532	49.7	4,606	35.0
April	7,641	58.1	4,137	31.5
May	8,466	61.5	3,627	26.3
June	8,872	60.2	4,894	33.2
July	9,065	58.2	5,477	35.2
August	10,074	64.0	4,554	29.0
September	10,783	68.2	3,613	23.0
October	11,551	71.9	3,091	19.2
November	11,868	72.3	2,935	17.9

Source: *Treasury Bulletin* and *Federal Reserve Bulletin*.

<sup>a</sup> Selected banks covered by Treasury Department survey, numbering under 6,000 at the start of the period and over 7,000 at the end.

end of April 1942, i.e., just before the posted bill policy became effective, commercial banks held 61 percent of the total amount outstanding and the Federal Reserve Banks held under 5 percent. With the expansion in the amount of bills currently being issued, both commercial banks and Reserve Banks increased their holdings. In May 1943, the volume of Treasury bills held by commercial banks reached a peak of \$7,017 million. At that time 65 percent out of a total of \$10,853 million of Treasury bills outstanding were lodged in commercial banks. On the same date the twelve Federal

**CHART 9—DISTRIBUTION OF TREASURY BILL HOLDINGS, APRIL 1942 - NOVEMBER 1944**



Source: *Federal Reserve Bulletin* and *Treasury Bulletin*.

Reserve Banks, with \$1,531 million on repurchase option and \$911 million owned outright, held 22 percent of the total.

Beginning in June 1943, and again toward the end of the year, Treasury bills poured into the Federal Reserve Banks. Until May 1943 the Treasury bill account of the Federal Reserve could claim to be primarily a device for adjusting variations in the cash requirements of member banks. From then on, although there were movements in and out, the account was no longer principally an adjusting mechanism. The primary reason for the growth of the account was the need for additional Reserve Bank credit following heavy demands for liquid funds by member banks and the public generally. The fact that the need expressed itself so largely in the acquisition of Treasury bills by the Reserve Banks was partly a reflection, apparently, of the saturation of demand for Treasury bills on the part of banks and of a desire to shift to other securities carrying a higher yield. This desire showed itself both in the sale to the Reserve Banks of bills originally acquired by banks and in the necessity of the Reserve Banks absorbing a larger proportion of new issues by taking them off the hands of dealers without their ever reaching the vaults of commercial banks.

The fact that a considerable volume of Treasury bill holdings was being shifted from commercial banks to the Federal Reserve did not mean that Treasury bills had ceased to act as a cushioning device. There was still a substantial movement in and out of the account, and commercial banks made use of bills to obtain additional reserves when necessary, or to invest cash when temporarily in excess of needs. From the start of the Treasury bill policy, Federal Reserve holdings of bills fell essentially into two parts — those that served primarily as a cushion, and those held as the result of a more or less permanent addition to the supply of reserves in the market. With the passage of time, the second category became of increasingly greater importance.

In general, the Treasury bills held by the Reserve Banks on repurchase option have constituted a high proportion of the total though the share declined greatly in 1944 (Table 16). The maximum amount held on this basis was reached in October 1944, with a total of \$5,012 million. It is customary to grant the repurchase option more or less automatically when banks take the initiative in selling bills. The actual volume of bills held under option is

**TABLE 16—TREASURY BILLS HELD BY FEDERAL RESERVE  
BANKS SUBJECT TO REPURCHASE OPTION,  
SEPTEMBER 1942 TO DECEMBER 1944**  
(dollar figures in millions)

<i>End of</i>	<i>Amount</i>	<i>Percentage of Total Bills Held by Federal Reserve Banks</i>
<i>1942</i>		
September	\$207	31.5%
October	96	20.0
November	47	12.3
December	578	57.2
<i>1943</i>		
January	296	43.0
February	860	58.3
March	1,240	59.4
April	1,377	56.7
May	1,531	62.7
June	2,810	73.7
July	3,803	77.7
August	4,486	78.7
September	4,248	79.4
October	4,396	79.3
November	4,688	76.1
December	3,845	56.8
<i>1944</i>		
January	3,617	52.1
February	2,908	45.3
March	3,398	52.0
April	4,001	52.4
May	4,093	48.3
June	3,635	41.2
July	3,564	39.4
August	4,583	45.5
September	4,829	47.8
October	5,012	43.6
November	4,584	38.6
December	3,984	35.7

Source: *Federal Reserve Bulletin*.

not of great significance, since it does not necessarily reflect an expectation to repurchase. Once a given volume of Reserve credit is built up it becomes necessary for the Reserve Banks, in order to avoid a contraction, to replace bills and other Treasury securities as they mature. Replacement is ordinarily effected by buying

Treasury bills, and inasmuch as bills acquired in this manner are not held under the option to repurchase, the result is a declining ratio of option bills to the total.

The principal need of commercial banks for additional liquid funds was to meet the demand for currency in circulation and to satisfy the rise in reserve requirements resulting from the growth in deposits. After April 1943 banks were no longer required to hold reserves against Treasury deposits based on newly issued securities purchased from the Treasury. Consequently, the transfer of large sums from private accounts to the government during war loan drives served to release reserves. These reserves were required again, as disbursements from government balances gradually transferred deposits back to private ownership.

This factor was largely responsible, during the Third War Loan Drive, for a reduction in member bank reserve requirements of \$1,707 million between September 8 and October 6, 1943. In the Fourth War Loan Drive reserve requirements fell by \$947 million between January 26 and February 23, 1944, in the Fifth by \$1,373 million between June 14 and July 12, 1944, and in the Sixth by \$976 million between November 22 and December 20, 1944. Instead of excess reserves rising by an equal amount, they increased by only \$54 million in February, by \$504 million in July and by \$215 million in December; the difference resulted largely from the use of free reserves to purchase Treasury bills.<sup>59</sup> The pronounced short-run fluctuations in the amount of required reserves rendered the introduction of the Treasury bill policy doubly important and timely, because it facilitated adjustments to temporary changes in liquidity requirements.

### *c. The Role of the Dealer*

In general a smaller proportion of the amount of Treasury bills applied for in each district is allocated in New York than in any of the other districts (see Table 17). However, the proportion of the total taken in the New York District has shown a tendency to increase. Both these features of the distribution of Treasury bills

<sup>59</sup> Also see Table 15. Holdings of Treasury bills by investors other than financial institutions and United States government agencies tended to increase prior to war loan drives and then to decrease (*Treasury Bulletin*).

TABLE 17—TREASURY BILL TENDERS AND ALLOCATIONS BY  
FEDERAL RESERVE DISTRICTS, DECEMBER 1942 AND  
DECEMBER 1944

(dollar figures in thousands)

District	December 23, 1942			December 22, 1944		
	Applied for	Accepted		Applied for	Accepted	
		Amount	Percent of Total		Amount	Percent of Total
Boston	\$32,265	\$21,043	3.50%	\$39,775	\$26,495	2.20%
New York	789,657	319,978	53.27	1,333,298	823,778	68.53
Philadelphia	35,906	20,187	3.36	51,905	35,385	2.94
Cleveland	35,650	20,092	3.34	29,265	28,065	2.33
Richmond	21,767	12,466	2.08	13,268	12,468	1.04
Atlanta	10,692	5,958	.99	12,570	12,330	1.03
Chicago	155,687	105,401	17.55	282,950	180,750	15.04
St. Louis	21,042	12,362	2.06	20,120	13,920	1.16
Minneapolis	16,862	15,389	2.56	8,990	6,580	.55
Kansas City	12,268	10,464	1.74	14,111	11,711	.97
Dallas	10,990	9,485	1.58	9,615	9,615	.80
San Francisco	77,620	47,884	7.97	52,165	40,965	3.41
ALL RESERVE BANKS	\$1,220,406	\$600,709	100.00%	\$1,868,032	\$1,202,062	100.00%

Source: Treasury Department, Press Releases, December 22, 1942 and December 23, 1944.

are a reflection of the important role played by dealers in government securities.

It has been customary for dealers, and some leading banks, to present large bids at the weekly offerings of Treasury bills.<sup>60</sup> The amounts applied for under current conditions do not represent what dealers expect to be able to pass on to their regular customers. Their bids serve the useful purpose, however, of helping to assure that the entire issue will be taken. In substance, the dealers in government securities underwrite, to the extent of their bids, each issue of Treasury bills. They, in turn, resell to the Federal Reserve at the official rate the bills they have been unable to distribute.<sup>61</sup> The bills thus turned back to the Federal Reserve by the dealers

<sup>60</sup> The bids are usually entered at 99.905, since these three decimal places correspond nearest to a yield of  $\frac{3}{8}$  percent. However, the price varies slightly according to whether the period is for 91 or 92 days.

<sup>61</sup> During the period under review the secondary distribution to dealers' customers has usually been small.

are sold as of the issue date, and all the interest income accrues to the Reserve Banks. Purchases from dealers enable the Reserve Banks to replace maturing Treasury obligations and thus offset any tendency for the volume of Reserve credit to contract.

The volume of sales to dealers is not published. In effect the amount dealers take is determined by the demand from other purchasers. Since the larger dealers in government securities are located in New York, a substantial increase in the proportion of sales in New York may indicate an increase in the amount of bills absorbed by dealers.<sup>62</sup> Such an indication is further strengthened if, at the same time, the share sold at the low rate rises or the average moves up toward the  $\frac{3}{8}$  percent yield. The combination of these various factors points to an increased reliance upon sales to dealers after the middle of 1943. The decline in allotments in New York at certain dates, particularly during war loan drives, when banks are in a position to expand their purchases of Treasury bills is further evidence of the residual position occupied by the dealers.

#### d. *Treasury Bill Policy as an Adjusting Mechanism*

The introduction of the Treasury bill policy provided an effective mechanism for enabling the Federal Reserve Banks to put additional funds into the market. Inasmuch as the initiative in effecting changes in the volume of cash rests with the individual member banks, the flow of cash is more or less automatically adjusted with respect to amount, place and time. Moreover, the mechanism facilitates, although it does not assure, the automatic contraction of reserve balances whenever and wherever they become excessive. The purchase and sale of Treasury bills permits more precise adjustments than ordinary open market operations, just as these permit finer adjustments than are possible by means of changes in reserve requirements. In short, it is most sensitive to changes in the liquidity needs of banks.

The Treasury bill technique has the further advantage that it does not necessitate any administrative decisions on the part of the

<sup>62</sup> This evidence, however, is far from conclusive. If purchases by banks and other buyers in New York were to decline, the proportion taken by dealers might increase without any change appearing in the total absorption of bills by the District as a whole.

authorities, whose role is purely passive. As regards the initiative resting with the banks and the automatic adjustment to varying requirements of particular banks it resembles discount and bankers' acceptance operations.<sup>63</sup> At the time of its introduction, the great advantage of Treasury bill policy over discount policy in meeting the liquidity requirements arising out of the war was that it had no popular prejudice with which to contend. Its superiority lay not so much in its technical provisions as in the manner in which it circumvented the tradition against borrowing.

Treasury bills have provided an effective means of adjusting the cash position of banks. But this is only one of the ends served by Treasury bills, and in the course of time certificates and other Treasury obligations of still longer maturity have also come to perform something of the function of an adjusting medium. In terms of its ideal functioning as a regulator of the quantity of member bank reserves, it might have been expected that changes in the volume of Treasury bills offered for sale to the Reserve Banks would reflect changes in the banks' needs for currency and reserves. Thus a sustained increase in Federal Reserve holdings of bills might have been taken to indicate an overissue, and to guide the Treasury in cutting down on future offerings. No such automatic operation has been realized. During part of the time increased offerings of bills at the Federal Reserve Banks reflected not so much a change in the credit needs of member banks as their desire to substitute higher-yield securities for the low-yield Treasury bills.

#### *e. Relation to Treasury Financing*

By the middle of 1943 the magnitude of Federal Reserve holdings of Treasury bills exceeded the proportions of what could reasonably be regarded as an adjustment fund. From that time on Treasury bills were primarily the means relied upon by the Reserve Banks to maintain an adequate volume of liquid funds in the market. In fulfilling this purpose, they had the further effect of enabling the Treasury to borrow from the Reserve Banks at a low rate of interest. The purchase of Treasury bills constituted a form

<sup>63</sup> In the case of discounting, the authorities are technically not entirely passive since they must pass upon the quality of the paper presented; not even this is necessary in the case of the purchase of Treasury bills.

of borrowing from the Reserve Banks that was less likely to provoke criticism than borrowing directly or by means of other securities.

Instead of increasing Treasury borrowing from the Federal Reserve Banks this policy may actually have had the opposite effect. The amount of securities absorbed by the Reserve Banks was determined primarily by the requirements of member banks for additional reserves. To the extent that the Treasury bill policy led to the utilization of excess reserves that would otherwise have remained idle, its effect was to restrict the creation of new Reserve Bank credit and therefore the total purchases of Treasury obligations by the Reserve Banks.

In the absence of the activation of excess reserves, it would have been necessary for the Reserve Banks to provide that much more credit by other means.<sup>64</sup> The payment of interest on what were in effect the excess reserves of member banks did not necessarily represent any additional cost to the Treasury, even though it increased the earnings of commercial banks. Assuming the same rate of interest on the securities that would have been acquired by the Reserve Banks as on the Treasury bills actually held by the member banks in lieu of excess reserves, the cost to the Treasury would be the same under either method of financing. The chief difference is that if a correspondingly larger volume of reserves had been created, the Treasury would have been paying interest to the Reserve Banks instead of to member banks.

#### *f. Relation to Other Federal Reserve Policies*

The Treasury bill policy, and particularly the circumstances attending its introduction, provided a means of educating banks away from their dependence upon large excess reserves to assure liquidity. Under conditions prevailing in wartime the existence of excess reserves has little direct bearing on credit control, since there is slight occasion for the expansion of bank credit except as may be necessitated by the Treasury's financing of the war, and the Reserve

<sup>64</sup> This observation presumes that considerations of national policy call for the creation of commercial bank credit in whatever amounts are necessary to meet the needs of the government's program of war finance, and that the Federal Reserve was under obligation to provide the reserves essential to the attainment of this end.

authorities would hardly be disposed to prevent that sort of expansion even if they could.<sup>65</sup>

The future level of reserves, however, will be of considerable significance in the control of credit by the Federal Reserve officials after the war. Even though present policies should entirely eliminate excess reserves, they might easily emerge again as a result, for example, of a contraction of the currency.<sup>66</sup> In any case, the amount of excess reserves will probably be less than it would have been if the excess had not been reduced during the war.

Under ordinary circumstances the volume of excess reserves is of considerable importance to potential changes in the circulating medium. However, in wartime the actual increase in deposits is governed by the needs of Treasury financing in relation to other sources of income, rather than by the amount of member bank reserves. Failure to utilize excess reserves merely leads to enlarged Reserve Bank credit operations, and does not affect materially the amount by which deposits of commercial banks are increased.

#### *g. Relation to Member Bank Operations*

The posted bill rate had the effect, in substance, of enabling banks to earn interest on their excess reserves without undergoing the slightest sacrifice of liquidity. As contrasted with holding an equal amount of assets in the form of excess reserves, it is considerably more profitable to put them into Treasury bills. But it is not to be supposed that this is the only, or necessarily the most profitable, alternative that is open to a bank. The bank also has the choice of putting its funds into Treasury certificates yielding  $\frac{7}{8}$  percent with the assurance that it can borrow on them at any time from its Federal Reserve Bank at a preferential rate of  $\frac{1}{2}$  percent. Or it can buy Treasury bonds bearing, for example, a 2 percent return and use them as collateral in borrowing at the official discount rate, now 1 percent. The use of certificates would seem to involve no significant sacrifice of liquidity as compared with Treasury bills.

<sup>65</sup> The Federal Reserve officials have, of course, encouraged the financing of the war as far as possible by means other than borrowing from commercial banks.

<sup>66</sup> As indicated elsewhere, the existence of large holdings of Treasury bills by the Federal Reserve Banks will facilitate absorption of excess reserves in case they emerge in the future. The running off of bills would eliminate reserves with much less pressure on security prices than would result from sales of other types of securities in the open market.

It could, however, be argued that on notes and bonds there is greater risk, since the Federal Reserve discount rate may some day be raised and the privilege of borrowing on government securities

**TABLE 18—POSSIBLE INCOME FROM ALTERNATIVE METHODS OF PROVIDING LIQUIDITY<sup>a</sup>**

	<i>\$10,000,000 in the form of:</i>			
	Excess Reserves	Treasury Bills	Certifi- cates	10-Year Bonds
<b>Income while not in use to meet reserve requirements (9 months)</b>				
Amount	nil	\$28,125	\$65,625	\$150,000
Net rate per annum	0%	¾%	¾%	2%
<b>Net income while used as, or to provide, required reserves (3 months) <sup>b</sup></b>				
Amount	nil	nil	\$9,375	\$25,000
Net rate per annum	0%	0%	¾%	1%
<b>Total income for year</b>				
Amount	nil	\$28,125	\$75,000	\$175,000
Average rate per annum	0%	9/32%	¾%	1¾%

<sup>a</sup> *Assumptions:*

1. Bank desires to hold \$10,000,000 in a form to meet fluctuations in cash requirements;
2. Over the period of a year the funds will actually be in use to meet reserve requirements, on the average, one-fourth of the time;
3. The posted bill policy is continued and rates of ½ percent and 1 percent, respectively, are maintained on borrowing from the Federal Reserve on notes secured by government obligations under and over one year maturity.

<sup>b</sup> In the case of certificates and bonds, dollar amount represents interest received on security minus interest paid on advance from Reserve Bank.

at par be withdrawn. The market value of longer-term securities is clearly subject to a greater degree of depreciation in the event of a rise in rates of interest.

The differences in return resulting from electing each of the four methods of providing for sudden increases in cash requirements are indicated in Table 18. The assumption made in this comparison, that the cash would be required a quarter of the time, is probably unduly generous, and to that extent the calculations understate the gain obtainable from putting funds into certificates or bonds in preference to buying Treasury bills. While the use of Treasury bills is clearly more advantageous than holding excess reserves, the gain is greater still from buying certificates or bonds.

TABLE 19—COMMERCIAL BANK HOLDINGS OF BILLS AND  
CERTIFICATES, JULY 1942 TO NOVEMBER 1944<sup>a</sup>  
(in millions)

<i>End of</i>	<i>Treasury Bills</i>	<i>Certificates of Indebtedness</i>
<i>1942</i>		
July	\$2,263	\$1,921
August	2,648	3,008
September	2,884	3,978
October	3,468	3,782
November	4,216	4,389
December	4,497	6,470
<i>1943</i>		
January	5,568	6,594
February	5,302	6,837
March	5,069	6,845
April	6,415	9,197
May	7,017	9,759
June	6,502	9,823
July	5,939	9,890
August	5,233	11,000
September	6,448	11,936
October	6,227	13,357
November	5,643	13,159
December	4,716	12,684
<i>1944</i>		
January	4,904	13,335
February	5,484	13,030
March	4,606	12,918
April	4,137	12,953
May	3,627	12,924
June	4,894	15,013
July	5,477	15,943
August	4,555	15,987
September	3,614	15,683
October	3,092	15,447
November	2,935	15,862

Source: *Treasury Bulletin*.

<sup>a</sup> Banks covered by Treasury Department survey.

Reliance upon either certificates or bonds in lieu of Treasury bills to provide liquidity is discouraged, however, by the prejudice against borrowing,<sup>67</sup> but this obstacle was not sufficient to prevent

<sup>67</sup> A proposal was advanced to extend the buying policy, at a suitable rate, to certificates for the purpose in part of overcoming this obstacle.

a shift from bills to certificates during 1943 and 1944, as may be seen from Table 19. At the end of November 1942 commercial bank holdings of bills and certificates were fairly evenly balanced. At that time the commercial banks covered in the Treasury Department's survey held \$4.2 billion of Treasury bills and \$4.4 billion of certificates. From then until the end of September 1943, both increased, but certificates increased more rapidly than bills. On that date the commercial banks included in the Treasury survey held \$6.4 billion in bills and \$11.9 billion in certificates. Thereafter holdings of certificates continued to rise while holdings of Treasury bills decreased. At the end of November 1944, commercial banks held \$2.9 billion in bills and \$15.9 billion in certificates. Whether there may have been a disposition to shift funds into still longer maturities as an alternative to holding them in either excess reserves or bills is obscured by the over-all growth in the volume of government securities.

In view of the advantages of holding assets in some other form than excess reserves, and the absence of any appreciable sacrifice of liquidity, it is somewhat surprising to find that excess reserves showed no tendency to disappear. Throughout most of the first half of 1943 the weekly total of member bank excess reserves fluctuated between \$1.5 and \$2.3 billion. Thereafter they declined, but it was not until December that they fell below \$1 billion. Excess reserves were chiefly concentrated, however, in country banks. At the middle of December 1944 excess reserves were distributed among different classes of banks as follows:<sup>68</sup>

<i>Class of Bank</i>	<i>Required Reserves</i>	<i>Excess Reserves</i>	<i>Percentage of Excess</i>
	(millions)		
Central reserve city	\$4,602	\$30	.7
Reserve city	5,295	359	6.8
Country	2,987	895	30.0

On the average, country banks at the end of 1944 held excess reserves amounting to approximately \$140,000 per bank. No entirely satisfactory explanation has been offered of why excess reserves of these proportions continued to be maintained. In some instances banks subject to excess profits taxation are said to have

<sup>68</sup> *Federal Reserve Bulletin* (February 1945) p. 145.

felt that the net gain from holding bills rather than cash was not worth the bother involved. Country banks, accustomed to a considerably higher rate of return, may have found the rate of return insufficient to attract them and also may have been deterred by lack of familiarity with the discount feature of Treasury bills. Others clung to the view that it was desirable to have a certain amount of excess reserves in the accustomed form.

There was, nevertheless, a tendency for the total volume of excess reserves to move irregularly downward. Their amount, after fluctuating for a time about a reduced total, repeatedly broke through to a new level. How far this downward progression would continue was never entirely clear. The fact that excess reserves still exist among smaller banks does not, in any case, obscure the success of the Treasury bill policy in helping to eliminate them among the largest banks and to reduce them among others.

## IN REVIEW

The most conspicuous banking change since the start of the war has been the growth in holdings of Treasury obligations, which rose from 40 percent of the earning assets of all commercial banks in June 1939 to 71 percent five years later. During the same period the volume of other types of bank investments and loans declined or remained approximately unchanged. As a result, only a small proportion of commercial bank assets are vulnerable to a drop in commodity prices or agricultural land values such as occurred after the last war. Furthermore, the bulk of bank assets are no longer in a form likely to contract so abruptly in a period of business recession as they did in the early thirties.

The average maturity of assets has become shorter since 1939, with a pronounced increase in the proportion of securities maturing within one year and a sharp reduction in those maturing in ten years or longer. The rise in the proportion of short-term Treasury obligations to total bank assets has kept close pace with the decline in the proportion of cash. In June 1944 the sum of cash and short-term Treasury securities held by all insured banks amounted to 38.6 percent of assets compared with 33.3 percent five years earlier. It is safe to say that today many bankers feel more oppressed by an excess than by a deficiency of liquidity. And on the basis of cus-

tomary standards of excellence, the quality of bank assets seems higher today than ever before.

As in the last war period the entry of banks into the Federal Reserve System has been stimulated; membership in the Federal Deposit Insurance Corporation has also increased. By the end of 1943, 48 percent of all commercial banks and over 87 percent of all commercial bank deposits were embraced in the Reserve System, while over 98 percent of bank deposits were in banks which were members of the FDIC.

During the last war the number of commercial banks increased by nearly 2,000, while in this war there has been a substantial decrease. Total deposits, however, have grown more rapidly in this period than they did from 1914 to 1920. As a result of the decline in number of banks and the growth in deposits, the average commercial bank at the end of 1943 was five times as large as at the postwar peak in 1920, and nearly twice as large as in June 1939. By the end of June 1943 there were 15 banks with assets of a billion dollars or more, compared with 8 in June 1939, and there were 423 banks with assets in excess of \$25 million, compared with 262 in 1939. Yet the growth of the largest banks has not kept pace with the growth of banks in other size categories; in 1939 the 10 largest banks held 25 percent of all commercial bank assets, while by 1943 their share had declined to 23 percent. The increase in average size was greatest for country banks and least for central reserve city banks — just the opposite of what happened in the years between 1920 and 1939.

The responsibilities imposed upon the banks for helping to assure an ample supply of ready funds for financing the war effort, which was the announced objective of banking policy, have brought with them a rise in the proportion of highest grade assets in bank portfolios, an increase in the average size of banks and higher net earnings. As judged by all conventional tests, these are the characteristics of strong and vigorous banking institutions. They are the outward, if not entirely conclusive, signs of greater safety and security than existed either at the end of the last war or at the start of the present war.

At the same time, however, the character of banking has drastically altered, for the war accelerated a trend that has prevailed since the last war. Banks have now become chiefly custodians of

Federal debt, instead of being concerned mainly with furnishing working capital for commerce and industry. Because of the changes that have taken place the future of banking is linked, in large measure, to the future of the Federal securities market. And through this relationship and because of the duties the Reserve Banks have assumed *vis a vis* the securities market, the Federal Reserve System has come to occupy a position of unprecedented importance in the preservation of the safety and liquidity of the nation's banks.

# National Bureau of Economic Research

---

## Officers

N. I. STONE, Chairman  
SHEPARD MORGAN, President  
H. M. GROVES, Vice-President  
GEORGE B. ROBERTS, Treasurer  
W. J. CARSON, Executive Director  
MARTHA ANDERSON, Editor

## Directors at Large

CHESTER I. BARNARD, *President, New Jersey Bell Telephone Company*  
DAVID FRIDAY, *Consulting Economist*  
OSWALD W. KNAUTH, *New York City*  
H. W. LAIDLER, *Executive Director, League for Industrial Democracy*  
SHEPARD MORGAN, *Vice-President, Chase National Bank*  
GEORGE B. ROBERTS, *Vice-President, National City Bank*  
BEARDSLEY RUMI, *Treasurer, R. H. Macy and Company*  
HARRY SCHERMAN, *President, Book-of-the-Month Club*  
GEORGE SOULE, *Director, The Labor Bureau, Inc.*  
N. I. STONE, *Consulting Economist*  
J. RAYMOND WALSH, *Economist, Congress of Industrial Organizations*  
LEO WOLMAN, *Columbia University*

## Directors by University Appointment

E. W. BAKKE, *Yale*  
C. C. BALDERSTON, *Pennsylvania*  
W. L. CRUM, *Harvard*  
GUY STANTON FORD, *Minnesota*  
H. M. GROVES, *Wisconsin*  
CLARENCE HEER, *North Carolina*  
WESLEY C. MITCHELL, *Columbia*  
PAUL M. O'LEARY, *Cornell*  
T. O. YNTEMA, *Chicago*

## Directors Appointed by Other Organizations

PERCIVAL F. BRUNDAGE, *American Institute of Accountants*  
FREDERICK C. MILLS, *American Statistical Association*  
BORIS SHISHKIN, *American Federation of Labor*  
WARREN C. WAITE, *American Farm Economic Association*  
DONALD H. WALLACE, *American Economic Association*

## Research Staff

WESLEY C. MITCHELL, *Director*  
MOSES ABRAMOVITZ  
ARTHUR F. BURNS  
MORRIS A. COPELAND  
SOLOMON FABRICANT  
MILTON FRIEDMAN  
THOR HULTGREN  
SIMON KUZNETS  
RUTH P. MACK  
FREDERICK C. MILLS  
GEOFFREY H. MOORE  
RAYMOND J. SAULNIER  
GEORGE J. STIGLER  
DONALD S. THOMPSON  
LEO WOLMAN  
RALPH A. YOUNG

## Relation of the Directors to the Work of the National Bureau of Economic Research

---

1. The object of the National Bureau of Economic Research is to ascertain and to present to the public important economic facts and their interpretation in a scientific and impartial manner. The Board of Directors is charged with the responsibility of ensuring that the work of the Bureau is carried on in strict conformity with this object.

2. To this end the Board of Directors shall appoint one or more Directors of Research.

3. The Director or Directors of Research shall submit to the members of the Board, or to its Executive Committee, for their formal adoption, all specific proposals concerning researches to be instituted.

4. No report shall be published until the Director or Directors of Research shall have submitted to the Board a summary drawing attention to the character of the data and their utilization in the report, the nature and treatment of the problems involved, the main conclusions and such other information as in their opinion would serve to determine the suitability of the report for publication in accordance with the principles of the Bureau.

5. A copy of any manuscript proposed for publication shall also be submitted to each member of the Board. For each manuscript to be so submitted a special committee shall be appointed by the President, or at his designation by the Executive Director, consisting of three Directors selected as nearly as may be one from each general division of the Board. The names of the special manuscript committee shall be stated to each Director when the summary and report described in paragraph (4) are sent him. It shall be the duty of each member of the committee to read the manuscript. If each member of the special committee signifies his approval within thirty days, the manuscript may be published. If each member of the special committee has not signified his approval within thirty days of the transmittal of the report and manuscript, the Director of Research shall then notify each member of the Board, requesting approval or disapproval of publication, and thirty additional days shall be granted for this purpose. The manuscript shall then not be published unless at least a majority of the entire Board and a two-thirds majority of those members of the Board who shall have voted on the proposal within the time fixed for the receipt of votes on the publication proposed shall have approved.

6. No manuscript may be published, though approved by each member of the special committee, until forty-five days have elapsed from the transmittal of the summary and report. The interval is allowed for the receipt of any memorandum of dissent or reservation, together with a brief statement of his reasons, that any member may wish to express: and such memorandum of dissent or reservation shall be published with the manuscript if he so desires. Publication does not, however, imply that each member of the Board has read the manuscript, or that either members of the Board in general, or of the special committee, have passed upon its validity in every detail.

7. A copy of this resolution shall, unless otherwise determined by the Board, be printed in each copy of every National Bureau book.

*(Resolution adopted October 25, 1926, and revised  
February 6, 1933, and February 24, 1941)*

## Financial Research Program: Committee

---

In the planning and conduct of all research under the Financial Research Program the National Bureau benefits from the advice and guidance of its Committee on Research in Finance. The functions of this committee are to review and supervise the specific research activities of the Program staff.

**RALPH A. YOUNG**, Chairman pro tempore — *University of Pennsylvania; Director, Financial Research Program*

**RAYMOND J. SAULNIER**, Secretary — *Barnard College, Columbia University; Research Staff, National Bureau of Economic Research*

**BENJAMIN HAGGOTT BECKHART** — *Columbia University; Director of Research, Chase National Bank*

**WILLIAM J. CARSON** — *University of Pennsylvania; Executive Director, National Bureau of Economic Research*

**ERNEST M. FISHER** — *Director, Research in Mortgage and Real Estate Finance, The American Bankers Association*

**DAVID FRIDAY** — *Consulting Economist; Director, National Bureau of Economic Research*

**E. A. GOLDENWEISER** — *Director, Division of Research and Statistics, Board of Governors of the Federal Reserve System*

**F. CYRIL JAMES** — *Principal and Vice-Chancellor, McGill University*

**WALTER LICHTENSTEIN** — *Vice-President, First National Bank of Chicago*

**WALTER L. MITCHELL, JR.** — *Director of Surveys, Research and Statistical Division, Dun & Bradstreet, Inc.*

**WESLEY C. MITCHELL** — *Columbia University; Director of Research, National Bureau of Economic Research*

**SHEPARD MORGAN** — *Vice-President, Chase National Bank; President, National Bureau of Economic Research*

**WILLIAM I. MYERS** — *Dean, College of Agriculture, Cornell University*

**JACK H. RIDDLE** — *Economic Adviser, Bankers Trust Company*

**GEORGE BASSETT ROBERTS** — *Vice-President, The National City Bank; Treasurer, National Bureau of Economic Research*

**WOODLIEF THOMAS** — *Director, Division of Research and Statistics, Board of Governors of the Federal Reserve System*

**DONALD S. THOMPSON** — *Research Staff, National Bureau of Economic Research*

**ROBERT B. WARREN** — *Institute for Advanced Study*

**JOHN H. WILLIAMS** — *Dean, Littauer School, Harvard University; Vice-President, Federal Reserve Bank of New York*

**LEO WOLMAN** — *Columbia University; Research Staff, National Bureau of Economic Research*

**DONALD B. WOODWARD** — *Research Assistant to the President, Mutual Life Insurance Company of New York*

# Papers Published by the National Bureau of Economic Research

---

## Occasional Papers

1	MANUFACTURING OUTPUT, 1929-1937 (December 1940) <i>Solomon Fabricant</i> . . . . .	.25
*2	NATIONAL INCOME, 1919-1938 (April 1941) <i>Simon Kuznets</i> . . . . .	.25
3	FINISHED COMMODITIES SINCE 1879, OUTPUT AND ITS COMPOSITION (August 1941) <i>William H. Shaw</i> . . . . .	.25
4	THE RELATION BETWEEN FACTORY EMPLOYMENT AND OUTPUT SINCE 1899 (December 1941) <i>Solomon Fabricant</i> . . . . .	.25
5	RAILWAY FREIGHT TRAFFIC IN PROSPERITY AND DEPRESSION (February 1942) <i>Thor Hultgren</i> . . . . .	.25
6	USES OF NATIONAL INCOME IN PEACE AND WAR (March 1942) <i>Simon Kuznets</i> . . . . .	.25
*7	PRODUCTIVITY OF LABOR IN PEACE AND WAR (September 1942) <i>Solomon Fabricant</i> . . . . .	.25
*8	THE BANKING SYSTEM AND WAR FINANCE (February 1943) <i>Charles R. Whittlesey</i> . . . . .	.25
*9	WARTIME 'PROSPERITY' AND THE FUTURE (March 1943) <i>Wesley C. Mitchell</i> . . . . .	.35
10	THE EFFECT OF WAR ON BUSINESS FINANCING: Manufacturing and 'Trade, World War I (November 1943) <i>Charles H. Schmidt and Ralph A. Young</i> . . . . .	.50
11	THE EFFECT OF WAR ON CURRENCY AND DEPOSITS (September 1943) <i>Charles R. Whittlesey</i> . . . . .	.35
12	PRICES IN A WAR ECONOMY: Some Aspects of the Present Price Structure of the United States (October 1943) <i>Frederick C. Mills</i> . . . . .	.35
13	RAILROAD TRAVEL AND THE STATE OF BUSINESS (December 1943) <i>Thor Hultgren</i> . . . . .	.35
* <i>Out of Print</i>		

14	THE LABOR FORCE IN WARTIME AMERICA (December 1943)	
	<i>Clarence D. Long</i> . . . . .	.50
15	RAILWAY TRAFFIC EXPANSION AND USE OF RESOURCES IN WORLD WAR II (February 1944)	
	<i>Thor Hultgren</i> . . . . .	.35
16	BRITISH AND AMERICAN PLANS FOR INTERNATIONAL CURRENCY STABILIZATION (January 1944)	
	<i>J. H. Riddle</i> . . . . .	.35
17	NATIONAL PRODUCT, WAR AND PREWAR (February 1944)	
	<i>Simon Kuznets</i> . . . . .	.50
18	PRODUCTION OF INDUSTRIAL MATERIALS IN WORLD WARS I AND II (March 1944)	
	<i>Geoffrey H. Moore</i> . . . . .	.50
19	CANADA'S FINANCIAL SYSTEM IN WAR (April 1944)	
	<i>Benjamin H. Higgins</i> . . . . .	.50
20	NAZI WAR FINANCE AND BANKING (April 1944)	
	<i>Otto Nathan</i> . . . . .	.50
21	THE FEDERAL RESERVE SYSTEM IN WARTIME	
	<i>Anna Youngman</i> . . . . .	.50
22	BANK LIQUIDITY AND THE WAR	
	<i>Charles R. Whittlesey</i> . . . . .	.50

### Technical Papers

1	A SIGNIFICANCE TEST FOR TIME SERIES AND OTHER ORDERED OBSERVATIONS (September 1941)	
	<i>W. Allen Wallis and Geoffrey H. Moore</i> . . . . .	.50
2	THE RELATION OF COST TO OUTPUT FOR A LEATHER BELT SHOP (December 1941)	
	<i>Joel Dean</i> , with a Memorandum on Certain Problems in the Empirical Study of Costs by <i>C. Reinold Noyes</i> . . . . .	.50
3	BASIC YIELDS OF CORPORATE BONDS, 1900-1942 (June 1942)	
	<i>David Durand</i> . . . . .	.50