
Date: June 18, 2003
To: Messrs. Kos and Reinhart
From: Radha Chaurushiya and Ken Kuttner
Subject: Targeting the Yield Curve: The Experience of the Federal Reserve, 1942-51

With limited scope remaining for cuts in the nominal federal funds rate, one of the strategies currently under discussion involves the use of monetary policy to reduce longer-term interest rates. One of the measures that could be used to effect such a reduction is a direct cap on longer-term yields. This memo examines in some detail the most famous precedent for such a policy: During the nine-year period from early 1942 until the Treasury-Federal Reserve Accord of 1951, the yield on long-term Treasury bonds was capped at 2½ percent, and ceilings were also imposed at several other points along the yield curve. In addition, the yield on short-term Treasury bills was pegged at ¾ percent up until July 1947. Our principal findings are as follows:

- The ceilings on long-term interest rates were binding for one year, in that only from late 1947 to December 1948 were large securities purchases required to enforce the ceiling. A key factor in keeping long-term yields below the caps prior to 1947 was the indefinite commitment to a bill rate of only ¾ percent. Even when the caps were not binding, the implicit commitment to the caps limited bonds' downside price risk, and therefore may have been another factor helping to keep long-term rates low.
- Maintaining a pattern of interest rates inconsistent with market expectations about near-term monetary policy led to large shifts in the composition of private-sector and Federal Reserve portfolios. Prior to 1947, when the bill rate was pegged at a very low level relative to bond rates, private investors abandoned bills and accumulated bonds, while the System did the opposite. The July 1947 increase in the bill rate put pressure on the 2½ percent cap on bond yields, forcing the System to accumulate a large volume of long-term bonds in order to enforce the cap.
- The obligation to maintain the interest rate caps interfered with the Federal Reserve's pursuit of its monetary policy objectives on numerous occasions, particularly during the economic expansion accompanying the onset of the Korean War. The recognition that the caps could not be maintained without exacerbating inflationary pressures eventually led to the Treasury-Federal Reserve Accord of 1951, which (among other things) discontinued the interest rate ceilings.

- The abandonment of the cap on long-term interest rates in April 1951 meant a decline in the value of bonds, raising concerns about the balance sheets of the institutions holding those bonds. To offset a portion of those losses, the Treasury offered to exchange the bonds for higher-yielding convertible securities.

The Origin of the Policy of Targeting the Yield Curve

The policy of pegging the short-term interest rate and imposing ceilings on longer-term interest rates resulted primarily from the requirements of wartime finance, rather than monetary policy considerations *per se*. But the seeds of greater involvement by the Treasury and the Federal Reserve in the Treasury market were sown years before the onset of WWII. These years were also characterized by the Treasury's increasing dominance over the Federal Reserve on interest rate policy.

In early 1935, for example, the Treasury's concerns about the impact of rising interest rates on its debt management objectives led it to ask the Federal Reserve to stabilize bond prices. The System responded by purchasing long-term government bonds for the first time in its history.¹ Two years later, the Federal Reserve again intervened in the Treasury market, purchasing \$104 million in bonds in an attempt to stem the decline in long-term bond prices that followed the 1937 increase in reserve requirements. The decision to intervene was no doubt influenced by pressure from Treasury, which threatened to end gold sterilization unless the System purchased bonds.² Deeming it "in the public interest to exert its influence in a positive way toward maintaining orderly conditions in the market for United States Government securities," the Federal Reserve also purchased \$100 million in bonds in 1939, as the outbreak of war in Europe put upward pressure on yields.³

Coordination between the Federal Reserve and the Treasury intensified in the early summer of 1941, when the Federal Open Market Committee began holding joint conferences with the Treasury to consider the development of a long-term program for

¹ See Eichengreen and Garber (1991).

² Meltzer (2003, pp. 511-512) writes, "[Treasury Secretary] Morgenthau tried to get a commitment from the Federal Reserve about how much it would let interest rates rise, but [Federal Reserve Chairman] Eccles would not go beyond a general commitment to continue easy policy. Morgenthau threatened to end gold sterilization, in effect nullifying the Federal Reserve's action."

³ The Federal Reserve was, however, quick to note that the System had "neither the obligation nor the power to assure any given level of prices or yields." (*Annual Report*, 1939, p. 5.)

financing the government's rapidly growing debt. In effect, this required keeping the interest rates paid by the Treasury from rising.

Views differed as to how best to achieve this goal.⁴ Treasury officials asserted that the best way to maintain low long-term rates was to keep *short-term* interest rates low through the generous supply of reserves to the banking system. In contrast, Federal Reserve officials were concerned about the inflationary consequences of such a policy. They favored allowing the short-term interest rate to rise, and as an alternative, proposed using outright purchases of long-term Treasury securities to prevent increases in longer-term rates. The Federal Reserve believed such a policy could be used successfully to maintain a long-term Treasury rate of 2½ percent and proposed announcing that rate as its target.

In a compromise struck on March 20, 1942, Federal Reserve and Treasury officials agreed to cap the long-term Treasury yield at 2½ percent, the seven- to nine-year yield at 2 percent, and the one-year rate at 7/8 percent. The Federal Reserve strenuously opposed the Treasury's initial proposal to increase reserves, but eventually acquiesced to an alternative plan of posting a 3/8 percent rate on short-term Treasury bills. At the time, this 3/8 percent peg was seen as relatively innocuous, partly because the rate was slightly higher than the then-prevailing rate of ¼ percent on Treasury bills, and also because it was not then perceived as an indefinite commitment. Interestingly, the caps on long-term interest rates were never formally announced, perhaps to avoid embarrassment in case the policy proved unsuccessful.

The Wartime Impact of the Interest Rate Ceilings, 1942-45

The long-term Treasury yield rose sharply from 2 to nearly 2½ percent with the entry of the United States into the war in late 1941, as shown in the center panel of Chart 3. Although the long bond yield remained only a few basis points below the 2½ percent ceiling, the Federal Reserve never intervened to enforce the cap, suggesting that the caps were probably not directly binding over this period.

⁴ The origins of this policy, and in particular the conflicts between the Treasury and the Federal Reserve, are described in detail by Wicker (1969).

Instead, it was the $\frac{3}{8}$ percent peg of the short-term Treasury bill rate that drove the actions of the Federal Reserve and the private sector over this period. As the policy of capping the yield curve at longer maturities became apparent over the course of 1942 and 1943, it also became clear that a steep, upward-sloping yield curve was inconsistent with market expectations of future short-term rates. Specifically, under the expectations hypothesis of the term structure, a long-lived peg of the bill rate at $\frac{3}{8}$ percent would have implied levels of long-term interest rates considerably *below* the interest rate caps set by the Federal Reserve and the Treasury. At the same time, to the extent that they were expected to continue into the future, the caps greatly reduced the downside price risk associated with long-term bonds, which would have tended to reduce any term premia embedded in long-term yields.⁵ This naturally made investors much more willing to hold long-term bonds, whose yields far exceeded the $\frac{3}{8}$ percent yield on bills, greatly increasing the substitutability between maturities.

As a result, investors shifted their assets out of short-term bills and into long-dated Treasuries instead. In order to keep short-term interest rates from rising, the System was obliged to purchase bills in large quantities. Its holdings of short-term bills jumped from zero in March 1942 to \$13 billion (out of a total portfolio of \$23 billion) in August 1945, which represented 76 percent of all outstanding bills. As shown in Chart 1, the System's holdings of bills ballooned during this period, reaching 65 percent of the its portfolio as of August 1945. (Ninety-five percent of the portfolio consisted of securities maturing within one year.) By contrast, the $2\frac{1}{2}$ percent cap on long-term bonds was in all likelihood *above* what would have been the equilibrium rate in the absence of the cap, as seen by the fact that the Federal Reserve was never called upon to defend the ceilings. Consequently, System holdings of long bonds actually declined during the war, falling to just over \$1 billion in August 1945.

⁵ A deeper question is why this open-ended commitment to a low bill rate was viewed as sustainable. At some level, the explanation must involve low inflation expectations, perhaps owing to combination of the 1930s experience with deflation and the wartime price controls. Alternatively, Eichengreen and Garber (1991) suggest a credible, if implicit, commitment on the part of the Federal Reserve to fight inflation once prices exceeded some threshold helped restrain inflationary expectations.

Postwar Bust and Boom, 1945-47

Long-term interest rates began to decline in the spring of 1945 and continued to fall once the pressures of war finance abated, as shown in the center panel of Chart 3. In fact, the long bond rate had fallen well below the caps even before the end of the war, and by 1946 it was down to only 2 percent. Clearly, expectations of low future nominal short-term interest rates were the major factor keeping long-term rates low during this period, rather than the caps themselves.

Given that the bill rate had been pegged at $\frac{3}{8}$ percent since March of 1942, it is somewhat surprising that long-term interest rates did not start to decline until three years later, in 1945. Walker (1954) provides an extensive discussion of this apparent puzzle. One factor seems to be that even after the pattern of targeted rates had become clear, it was *not* clear how long this policy would be sustained; banks were evidently hoping the short-term bill rate would be allowed to rise in the future. The periodic “Victory Loan” drives were another factor. During these drives, which continued through December 1945, investors were allowed to purchase at par unlimited quantities of various Treasury issues, including the 2½ percent long-term bonds. This had the effect of actually keeping long-term interest rates *higher* than they would otherwise have been and effectively turned the interest rate cap into a peg. Indeed, by the final October–December 1945 drive, 59 percent of all bond purchases by the public were the long-dated 2½ percent issue.

The situation changed significantly as the economy recovered from its brief postwar contraction. Prices began rising rapidly in 1946 as wage and price controls were relaxed, and European demand for American goods surged. In spite of the jump in inflation, long-term interest rates remained low throughout 1946 and the first half of 1947 — either because the rise in prices was perceived as transitory, or because of a belief that the Federal Reserve would act at some point in the future to restrain inflation.

The maintenance of the low bill rate peg during much of the postwar boom is remarkable in and of itself. The Federal Reserve Bank of New York had advocated an increase in the bill rate as early as 1944, but Chairman Eccles was reluctant to make such

a move until the end of the war.⁶ One reason for this reluctance had to do with the stability of the banking system. Banks had absorbed a large amount of government securities relative to their available capital during World War II, which left them particularly vulnerable to increasing interest rates. This concern was echoed in the Board's 1945 *Annual Report*: "A major consequence of increasing the general level of interest rates would be a fall in the market values of outstanding government securities. These price declines would create difficult market problems for the Treasury in refunding its maturing and called securities. If the price declines were sharp they could have highly unfavorable repercussions on the functioning of financial institutions and if carried far enough might even weaken public confidence in such institutions." (*Annual Report*, 1945, p. 7.) A case for allowing the bill rate to rise was, however, made in the following year's *Annual Report*, which acknowledged that freeing up the short rate would allow interest rates to "become more responsive to demand," and restore "a higher degree of flexibility to the control of credit through the money market." (*Annual Report*, 1946, p. 5.)

The significant mid-1946 rise in the rate on ninety-day bankers acceptances and four- to six-month commercial paper rates, shown in the center panel of Chart 2, may have been a sign that the bill rate peg was viewed as increasingly unrealistic, and not representative of other market short-term interest rates. The 1946 *Annual Report* commented that the increases in other short-term rates at the time required the adjustment of the bankers acceptances rate to $\frac{3}{4}$ percent from just under $\frac{1}{2}$ percent, suggesting that the increase in private-sector interest rates was widespread.

The Defense of the Rate Caps, 1947–48

After subsiding during the first half of 1947, inflation again became a problem in the latter half of the year, rising at a 12 percent annual rate between June and December. Faced with growing inflationary pressure, the Federal Reserve struck an agreement with the Treasury in July 1947 to raise the bill rate peg, which reached 1 percent by the end of

⁶ Meltzer states, "...Eccles favored the fixed rate structure throughout the war to reduce financing costs..." (Meltzer, p. 597). In a March 1947 speech, Eccles stated, "...it would be desirable to permit some rise in short-term interest rates if necessary to prevent long rates from declining further as a result of debt monetization by banks." (Eccles, Speech on March 4, 1947)

the year. In August, the $\frac{7}{8}$ percent ceiling on nine- and twelve-month certificates was also allowed to rise to $1\frac{1}{8}$ percent by the end of the year.⁷ Intermediate yields were adjusted accordingly “in relation to the $2\frac{1}{2}$ percent long-term yield and the $1\frac{1}{8}$ percent rate on Treasury certificates.” (*Annual Report*, 1947, p. 6.) From this point on, the FOMC decided upon the level of the bill peg at FOMC meetings, subject to approval from the Treasury. The Federal Reserve was able to convince the Treasury to allow the July 1947 increase in short-term rates by paying the Treasury approximately 90 percent of the net earnings of the Federal Reserve Banks, offsetting the Treasury’s increased interest costs.

The yields on privately issued short-term debt did not rise as steeply as Treasury bill rates following the increase in the bill peg, resulting in a narrowing of spreads to their pre-1946 levels, as shown in the bottom panel of Chart 2. This, along with the widening of the same spreads earlier in the year, is further evidence suggesting that the linkage between private-sector interest rates and Treasury rates was somewhat looser than might have been expected based on experience.

With this significant increase in short-term interest rates, the $2\frac{1}{2}$ percent yield on long-term bonds no longer looked so attractive to investors. In addition, having abandoned the peg on short-term interest rates, there may also have been some doubts as to the credibility of the cap on long-term rates.⁸ The result was a large-scale shift of private sector portfolios out of bonds and into bills, which led in turn to upward pressure on long-term interest rates.

In late 1947, the System began to enforce the $2\frac{1}{2}$ percent ceiling on government bond yields through large purchases of bonds, including \$2 billion in November and December 1947 and \$3 billion in the first quarter of 1948. By the end of 1948, the System’s bond holdings rose from less than \$1 billion to roughly \$11 billion, going from a negligible portion of its portfolio to nearly 50 percent. Ultimately, the rate caps were successfully enforced, and the bond rate was kept at or below $2\frac{1}{2}$ percent for the duration

⁷ Certificates of indebtedness were Treasury obligations limited by law to a maturity of one year. The term of issue was usually eleven to twelve months.

⁸ In late 1947 and early 1948, Federal Reserve officials found themselves in a position of having to publicly reaffirm the continuation of the $2\frac{1}{2}$ percent cap for the foreseeable future; see Chandler (1949), pp. 413-414.

of 1948. It is worth noting that the defense was successful despite the Federal Reserve's relatively small share of the overall long-term bond market. Its peak holdings of \$11 billion in December 1948 amounted to just over 10 percent of total outstandings.

For most of this period, purchases of long-term bonds were financed entirely by maturing bills, leaving the overall size of the Federal Reserve's balance sheet largely unchanged. In late 1948, however, a significant share of the bond purchases was financed through an expansion in the System's balance sheet. The impact of this balance sheet growth on excess reserves was minimized by the August 1948 increase in required reserves from 22 to 26 percent of deposits.

There is some indication that corporate bond rates drifted away from Treasury rates over this period, although the evidence is less clear than in the case of short-term rates in 1946-47. The spread between Aaa-rated corporate bonds and Treasury bonds increased from 30 to 47 basis points between July and December 1947, when the Federal Reserve began its defense of the ceilings. The spread narrowed in 1948, but remained slightly above its 1947 levels. The spread did not narrow appreciably once the caps ceased to bind in 1949, however, which tends to suggest that the caps were not significantly distorting the relationship between the two rates.

Recession and Recovery: 1948-49

The recession that began in November 1948 reduced the inflationary pressure and demand for credit that had been building earlier in the year.⁹ Consequently, bond yields began to fall in the summer of 1948, which allowed the Federal Reserve to cease purchasing bonds in order to enforce the yield ceiling. The Federal Reserve was slow to recognize that the economy was in a recession, however, and continued pressing for higher short-term interest rates as a first step towards eliminating the bill rate peg entirely. The Federal Reserve proposed, and in March 1949 the Treasury rejected, a $\frac{1}{8}$ percentage point increase in the bill rate.

Meanwhile, the System took the opportunity of falling bond rates to liquidate some of the bonds it had accumulated in the course of its defense of the rate caps. It sold

⁹ The National Bureau of Economic Research dates the peak in November 1948, although prices and industrial production began turning down as early as August.

\$3 billion in bonds during the first few months of 1949 ostensibly “in response to market demand, primarily from nonbank investors.” (*Annual Report 1949*, p. 8.) The reductions in reserve requirements in May and June also resulted in System sales of government securities to banks in order to maintain current interest rates. The fall in the System’s government securities holdings is apparent in the top panel of Chart 1.

It was not until mid-1949 that the Federal Reserve cut short-term rates in response to the recession that had begun several months earlier, a delay partly explained by the ongoing struggle between the Federal Reserve and the Treasury. Having pushed the Treasury for increases in short-term rates since December 1948, the FOMC apparently hesitated in lowering short-term interest rates because it did not want to give the Treasury a reason to set the bill peg even lower. The Federal Reserve privately stated its willingness to allow short-term rates to decline if the Treasury would accept that this meant a greater flexibility and independence in interest rate policy in both directions.¹⁰ In late June 1949, the FOMC announced that, “the maintenance of a relatively fixed pattern of rates under present conditions has the undesirable effect of absorbing reserves from the market at a time when the availability of credit should be increased,” and decided to let the short-term interest rate fall. (*Annual Report, 1949*, p. 8.) A reduction in reserve requirements and the cessation of bond sales to banks further contributed to the expansionary stance of monetary policy.

The FOMC’s reaction to the end of the recession in October 1949 was much swifter than its response to the recession’s onset. In November, the Committee “adopted a policy of permitting growing credit demand to be reflected in rising short-term rates.” (*Annual Report, 1949*, p. 11.) Acting on this policy, the System sold short- and long-term securities in early 1950, which reduced excess reserves and contributed to a firming of short-term interest rates.

The Treasury-Federal Reserve Accord of 1951

Divisions between the Treasury and the Federal Reserve over interest rate policy deepened with the outbreak of the Korean War in June 1950. Congressional hearings on

money, credit, and fiscal policies, which had begun in fall 1949, became a forum in which the two institutions argued their cases in what was a rather public confrontation of Treasury policy by the Federal Reserve. The Treasury favored keeping interest rates low to facilitate war finance. Federal Reserve officials, on the other hand, favored higher interest rates in order to combat the inflationary pressures created by the war. These pressures developed very rapidly: In anticipation of possible wartime rationing, the public began buying up consumer goods, driving up the CPI at a 7.7 percent annual rate in the second half of 1950, and at a 17.2 percent rate in the first quarter of 1951. Inflation expectations rose rapidly as well. Surveys conducted by the Michigan Survey Research Center showed that in early 1950, only 15 percent of respondents believed that consumer prices would rise; a year later, 76 percent believed there would be an increase in prices. (Friedman and Schwartz, 1963, p. 599.)

The Federal Reserve's efforts to raise interest rates during this period were thwarted by Treasury's refusal to raise the interest rate ceilings. The FOMC voted in June 1950 to increase the one-year rate, but the Treasury refused and issued new certificates at the previous, lower rate, which the Federal Reserve was then required to support. System purchases of these securities resulted in a boom in its holdings of Treasury notes and certificates during the second half of 1950. Over this period, sales of longer-term securities were used to minimize the impact on these purchases on the overall size of the System's balance sheet.

The demand for bonds had tapered off as the year progressed, and the long-term bond rate began to rise in September 1950. By the end of the year, the Federal Reserve was once again in a position of accumulating long-term government securities in an effort to prevent yields from rising. At the same time, relatively few bills remained on the System's balance sheet, giving the central bank "less leeway for selling such securities in order to offset its purchases of other securities," and on net the open market operations

¹⁰ This condition of greater interest rate flexibility was not officially announced, and thus gave the Federal Reserve little room to argue when the Treasury later refused to allow short-term interest rates to increase after the end of the recession.

had an “expansionary effect on bank reserves.”¹¹ (*Annual Report*, 1950, pp. 3 and 10.) The January 1951 increase in required reserves did allow the Federal Reserve to purchase additional notes and bonds without increasing excess reserves. The additional \$2 billion in purchases in early 1951 were insufficient to stem the upward pressure on longer-term rates, however. Thus, it became abundantly clear during this period that the interest rate caps were hampering the Federal Reserve’s ability to achieve its monetary policy objectives, and in particular its efforts to contain rapidly rising inflationary pressures.

In March 1951, with the bond rate at 2.47 percent, the Federal Reserve and the Treasury negotiated the Accord that ended the direct setting of long-term interest rates, thus recognizing “the dilemma presented by the conflicting problems of debt management and credit restraint in the inflationary situation which developed.” (*Annual Report*, 1951, p. 98.) The released statement of the Accord read, “The Treasury and the Federal Reserve System have reached full accord with respect to debt management and monetary policies to be pursued in furthering their common purpose to assure the successful financing of the Government’s requirements and, at the same time, to minimize monetization of the public debt.” In April, the previous 2½ percent cap on the long-term Treasury yield was breached, falling below that level only once, in 1954.

One difficult issue associated with the abandonment of the interest rate caps was how to deal with the losses inflicted on bondholders by the rise in long-term interest rates. These losses could have had adverse implications for the solvency of banks and insurance companies, which were major holders of long-term Treasuries at the time. The Treasury’s solution was to allow bondholders (under certain conditions) to convert their old 2½ percent bonds into nonmarketable twenty-nine-year bonds with a 2¾ percent coupon that were convertible at the owner’s discretion into five-year notes with a 1½ percent coupon. Thus the Treasury absorbed much of the losses associated with its renunciation of the interest rate caps.¹²

¹¹ As of October 1950, the System held only \$763 million in bills (out of a portfolio of \$19 billion), which could conceivably have been liquidated to enforce the cap on the long bond yield. The portfolio did include \$14 billion in one-year certificates, but these had only just been purchased in an effort to defend the cap on the one-year rate.

¹² Details of the conversion plan appear the 1951 *Annual Report*, page 100.

Conclusions

Although the structure of the economy and financial markets have surely changed in the intervening sixty years, a number of pertinent conclusions can be drawn from the 1942-51 experience with using interest rate caps to manage the yield curve. During the first five years of the episode, the caps on longer-term yields were above the market rates that would have prevailed in the absence of the caps, given the expectations of low *future* short-term rates created by the open-ended bill rate peg and modest inflation expectations. Consequently, the Federal Reserve was able to maintain the longer-term rate ceilings until the end of 1947 without significant purchases of bonds.

The experience from 1948 until the Accord in 1951 illustrates the sorts of policy actions that could be required to enforce a set of interest rate caps and highlights the potential for conflict between monetary policy objectives and the interest rate ceilings. When the caps came under pressure in 1948, the Federal Reserve was obliged to aggressively purchase long-term bonds, resulting in a significant shift in the maturity composition of the System's portfolio. When the caps again came under pressure in late 1950, relatively few bills remained on the System's balance sheet, which forced the Federal Reserve to increase its total holdings of securities and release additional reserves into the banking system. Reserve requirements were raised in January 1951, which helped limit increases in excess bank reserves; however, inflation was still rising fairly rapidly at the end of 1950 and beginning of 1951. Consequently, the Federal Reserve became openly frustrated with the constraints on monetary policy associated with the commitment to support yields on government securities and pushed for an end to the policy.

The experience illustrates three other important issues that arise in the context of attempting to influence the slope of the yield curve. One is whether the ceilings on Treasury yields—to the extent that they were binding—were effective in also limiting private-sector interest rates, such as those on bankers acceptances and corporate bonds. Widening spreads between these rates and those on Treasuries suggest that the policy may not have been entirely successful in holding down private-sector yields. Another issue concerns the “exit strategy”—that is, how to discontinue the caps, once they are no longer needed. One likely reason for the reluctance to abandon the caps was the fear that

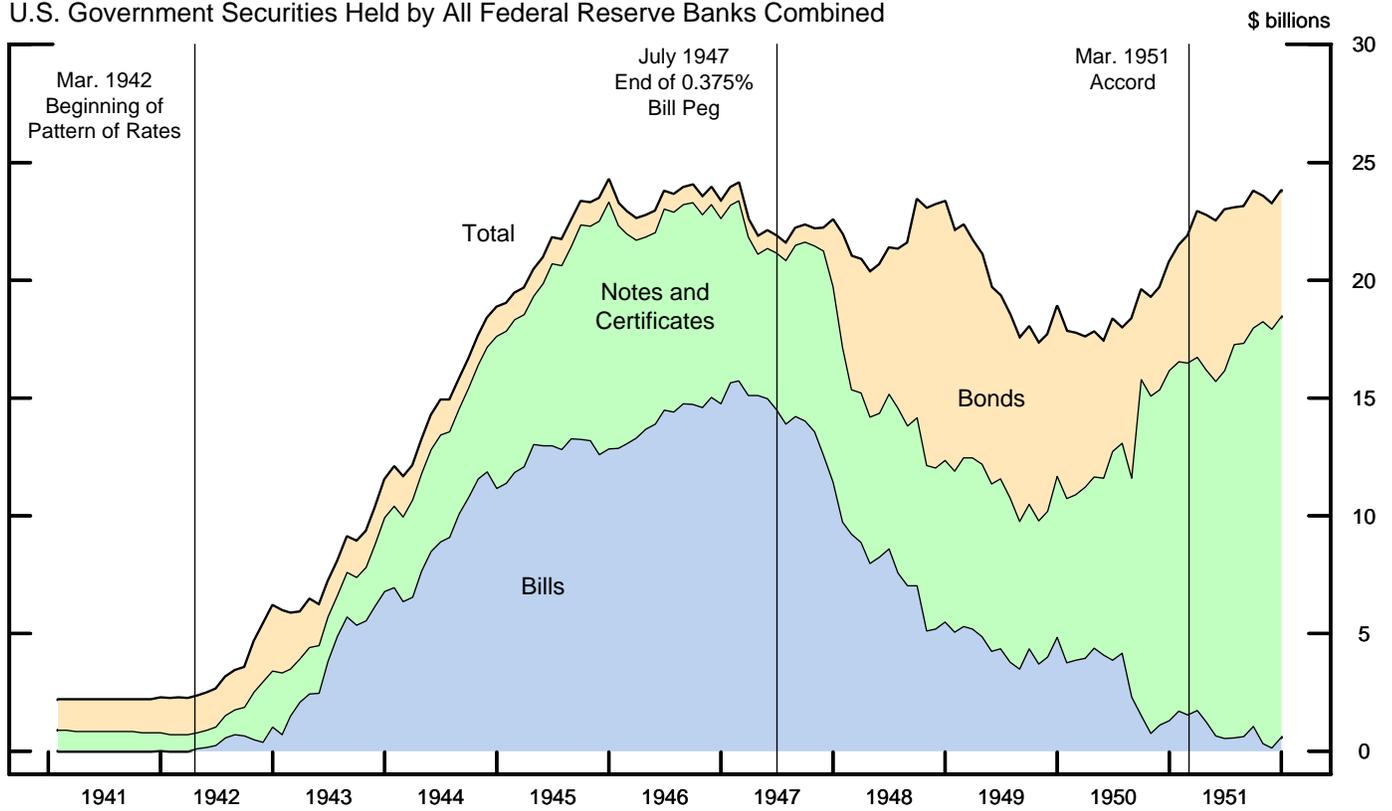
doing so would generate capital losses, which would in turn undercut the stability of the banking system. It was presumably with this in mind that the Treasury introduced a bond conversion program when the caps were dismantled in 1951, thereby insulating bondholders from the losses they would otherwise have experienced. A third issue is that because the direct management of the entire yield curve has a large and direct impact on the Treasury's financing costs, it increases the scope for conflict between the central bank and the fiscal authorities. Conflicts of this sort arose repeatedly during the pre-Accord period, and may have been a factor in prolonging the interest rate caps well after they had outlived their usefulness.

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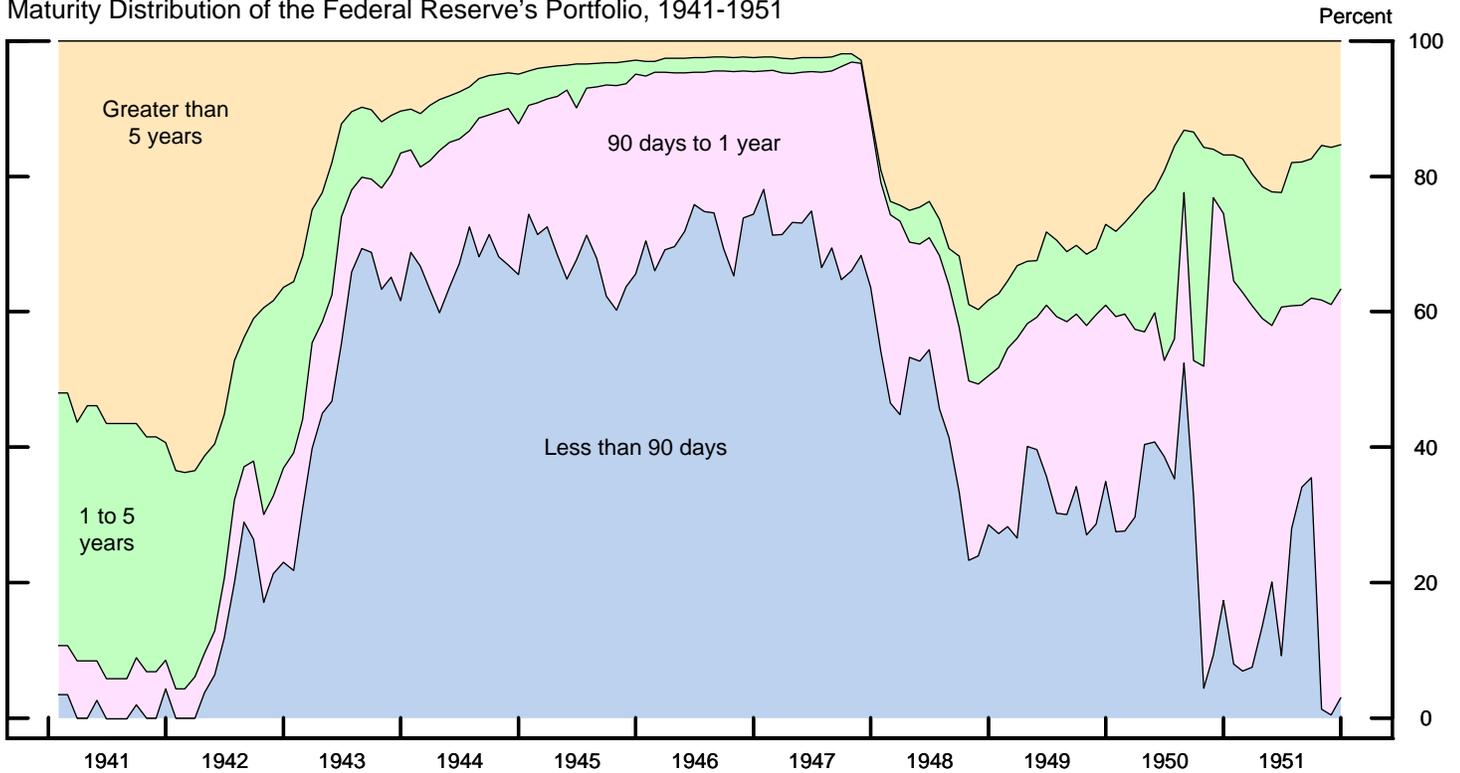
Chart 1
Federal Reserve System Holdings of Government Securities

U.S. Government Securities Held by All Federal Reserve Banks Combined



Source: Banking and Monetary Statistics, 1941-1970, Table 9.5(a).

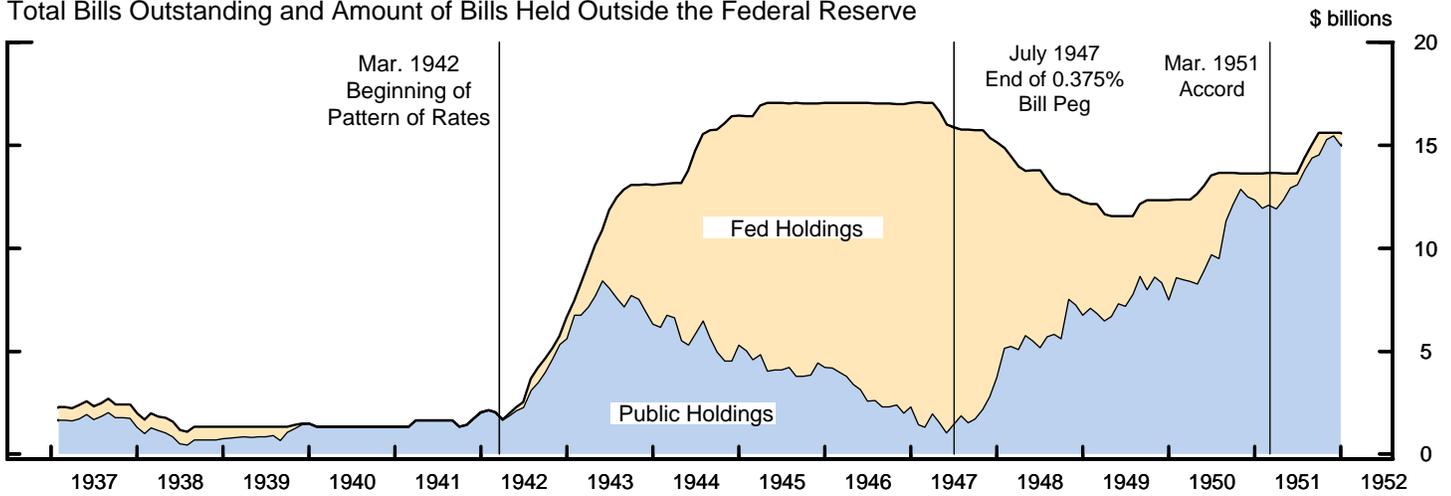
Maturity Distribution of the Federal Reserve's Portfolio, 1941-1951



Source: Banking and Monetary Statistics, Table 9.5(b).

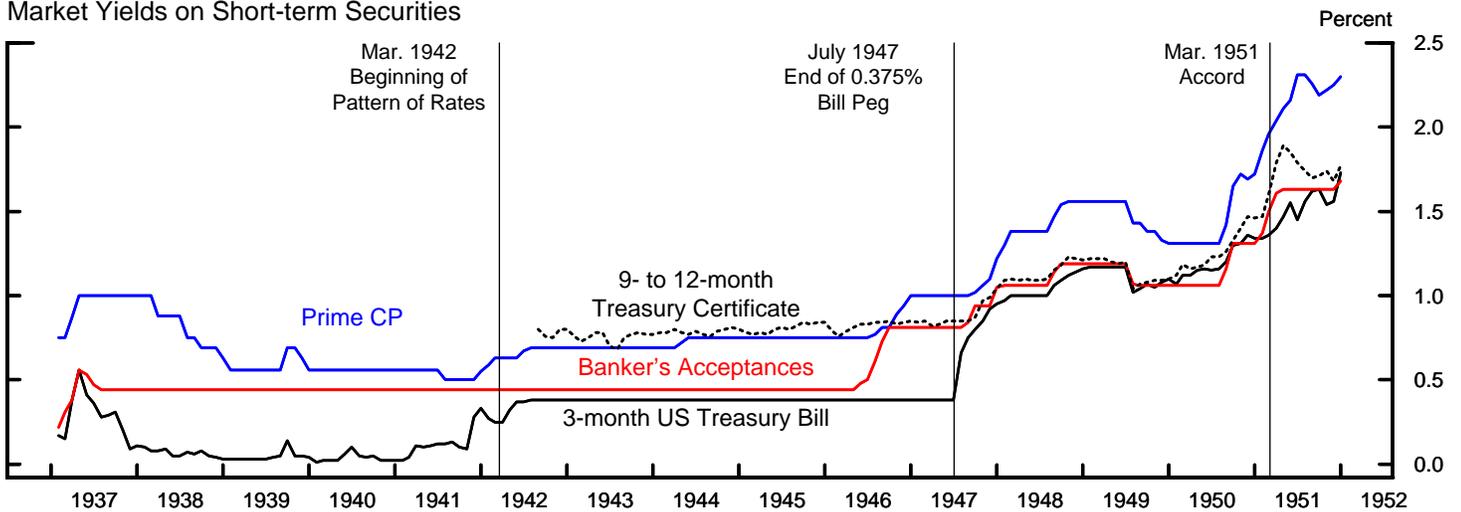
Chart 2
The Treasury Bill Market and Short-term Interest Rates

Total Bills Outstanding and Amount of Bills Held Outside the Federal Reserve



Source. Banking and Monetary Statistics, 1914-1941, Tables 146 and 91, and Banking and Monetary Statistics, 1941-1970, Tables 13.2 and 9.5

Market Yields on Short-term Securities



Source. Banking and Monetary Statistics, 1914-1941, Tables 120 and 122, Banking and Monetary Statistics, 1941-1970, Tables 12.5 and 12.7.

Short-term Private Interest Rate Spreads Over 3-month Treasury Bill

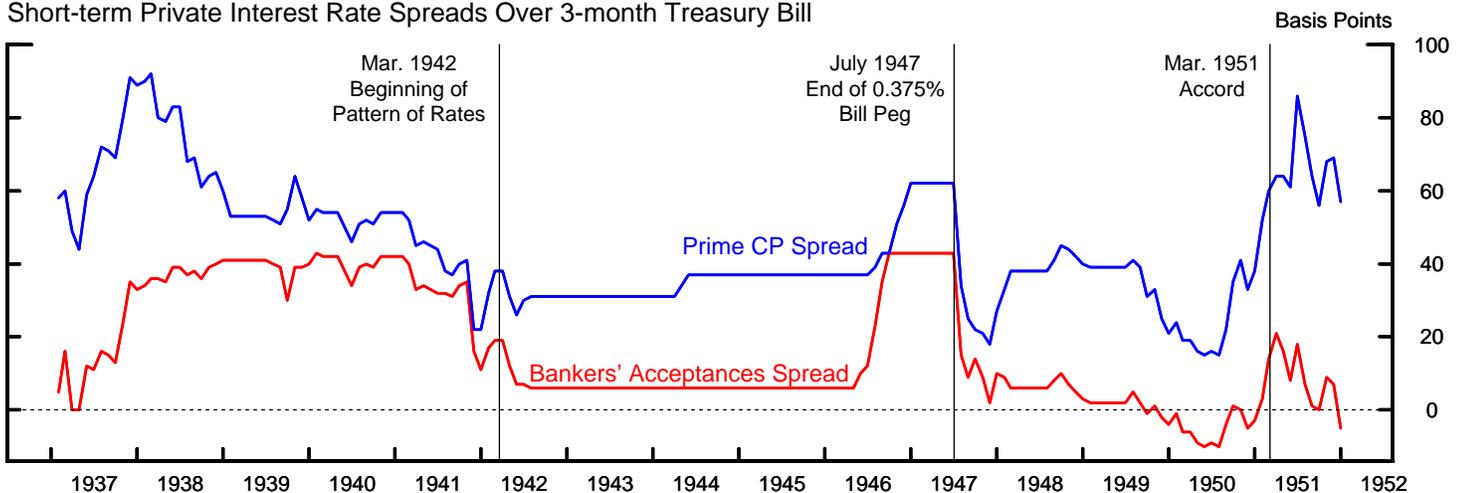
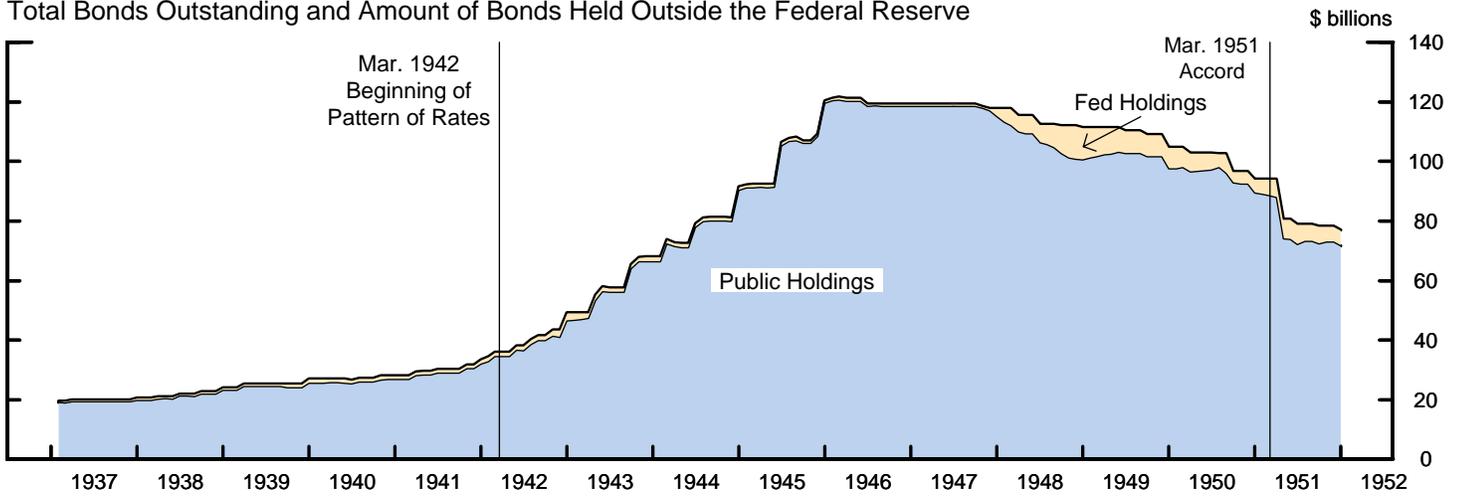


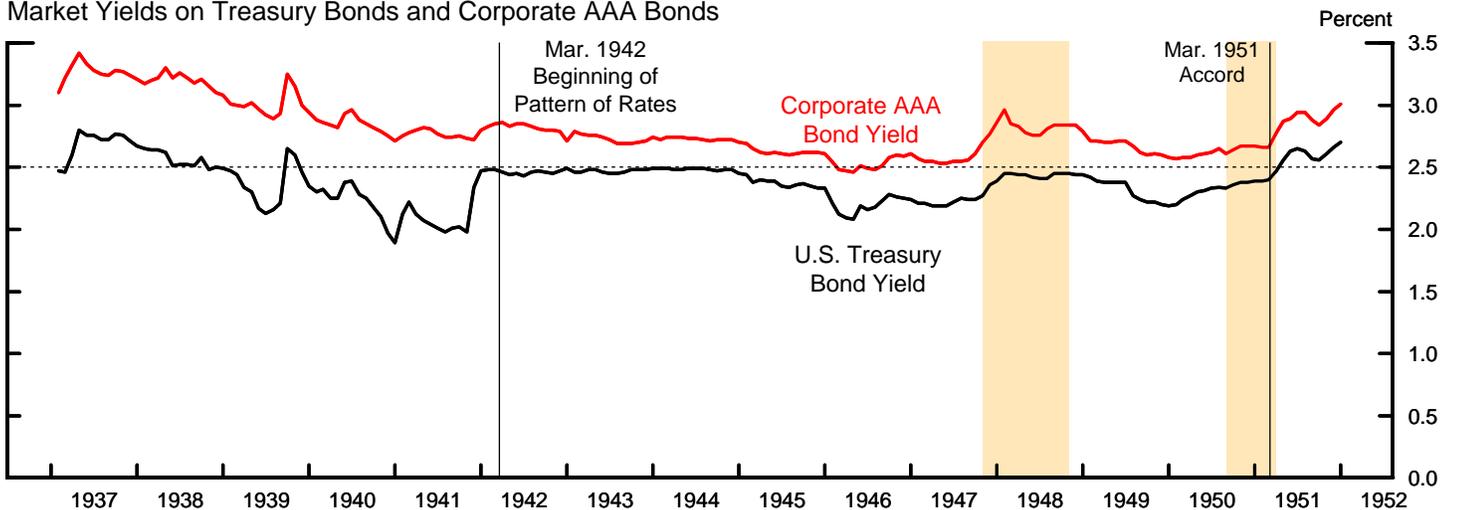
Chart 3
The Treasury Bond Market and Long-Term Interest Rates

Total Bonds Outstanding and Amount of Bonds Held Outside the Federal Reserve



Source. Banking and Monetary Statistics, 1914-1941, Tables 146 and 91, and Banking and Monetary Statistics, 1941-1970, Tables 13.2 and 9.5.

Market Yields on Treasury Bonds and Corporate AAA Bonds



Source. Banking and Monetary Statistics 1914-1941, Table 128 and Banking and Monetary Statistics 1941-1970, Table 12.12.

Note: Shading denotes periods during which the Federal Reserve was defending the rate caps by purchasing bonds.

Corporate AAA Bond Spread Over Treasury Bond

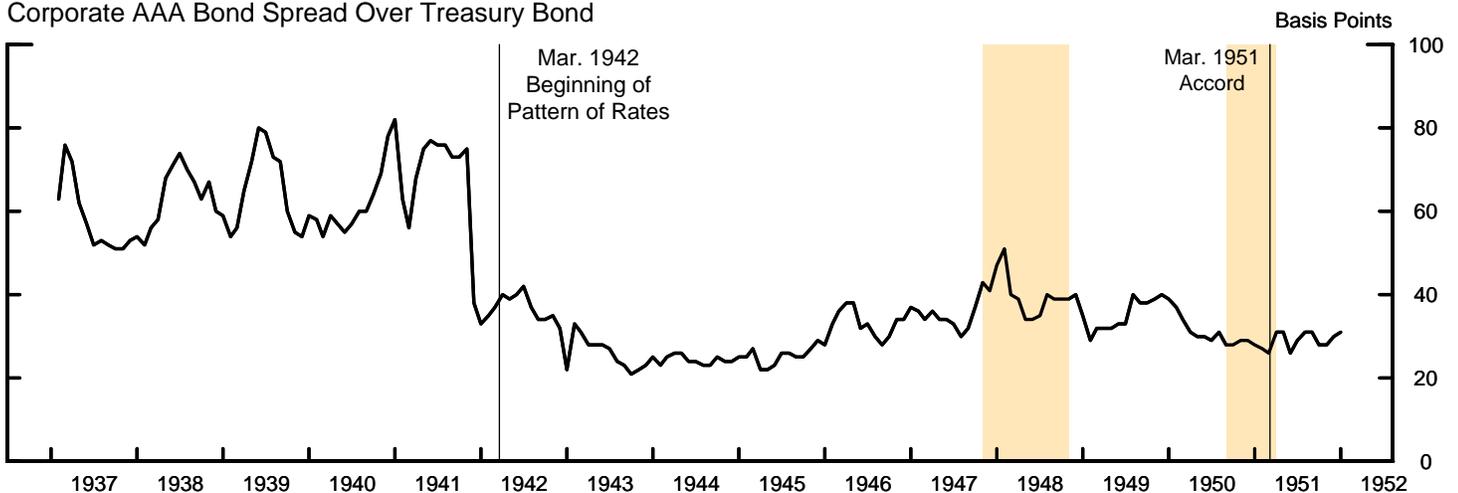
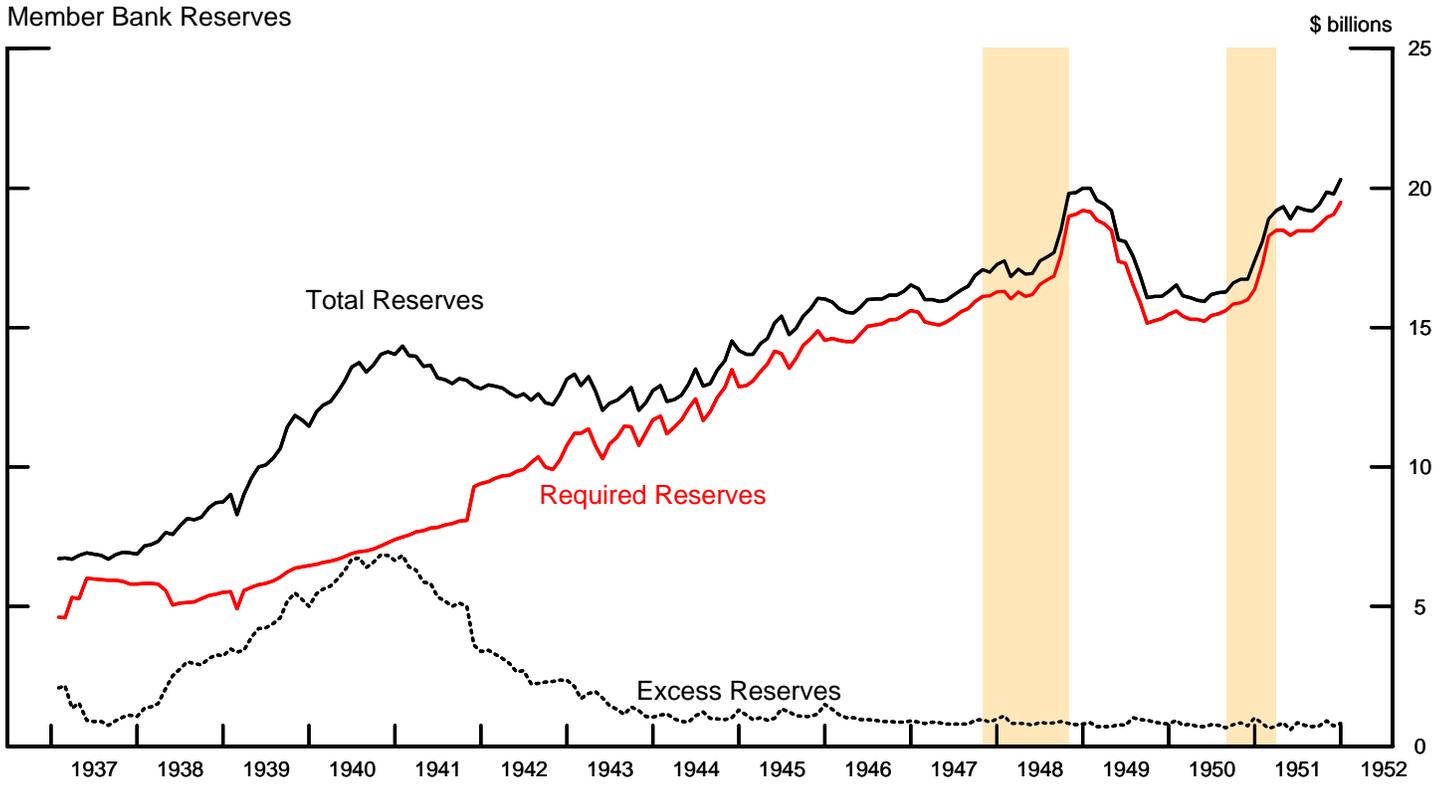
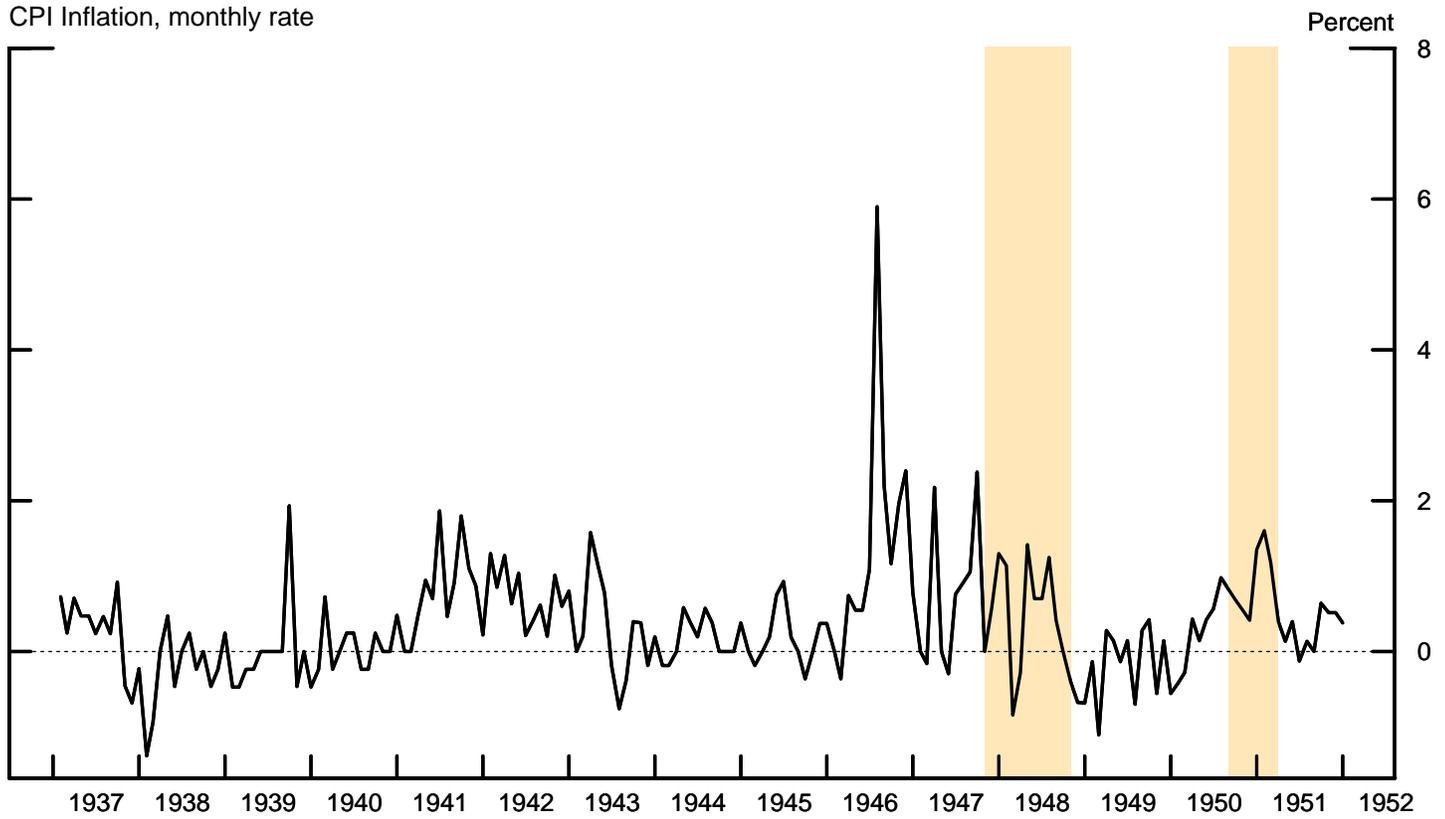


Chart 4
Total and Excess Reserves of Member Banks



Source: Banking and Monetary Statistics, Table 10.2. Note: Shading denotes periods during which the Fed was defending the rate caps by purchasing bonds.

Chart 5
Inflation Rate, 1937-1951



Source. Ibbotson SBBI 1990 Yearbook, page 161, Exhibit A-14. Note. Shading denotes periods during which the Federal Reserve was defending the rate caps by purchasing bonds.