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1 Was the Great Depression a Watershed for American Monetary Policy?

Charles W. Calomiris and David C. Wheelock

The Great Depression witnessed many substantial changes in the monetary policy environment of the United States. These changes included a relaxation of the gold standard, an opening of a new avenue for monetizing government debt, changes in the structure of the Federal Reserve System, and the birth of a new policy ideology that doubted the stability of private markets and prescribed government management of aggregate demand. Did these changes have lasting effects?

To address this question, we begin with a brief review of Federal Reserve policy before and during the Great Depression, which we compare with monetary policy since the depression. The legacy of the Great Depression is difficult to identify from immediate post–World War II policy outcomes because of the massive expansion of federal debt during the war and the Fed’s commitment to funding that debt at low cost during and well after the war. The period between 1934 and 1941 is thus especially important for gauging the effects on monetary policy of the cyclical downturn of 1929–33 and the institutional reforms it produced between 1932 and 1935. Moreover, 1934–41 was a period of transition for the international monetary regime and, thus, provides important evidence on the impact of changed international linkages on domestic monetary policy. Accordingly, we explore in some depth the monetary policy of 1934–41.

We discuss how the tools of Fed policy, but not its goals or tactics, changed in the mid-1930s. At the same time, we show how structural reforms weakened the Federal Reserve relative to the Treasury and removed a key limit on the monetization of government debt. While Fed policy goals and tactics did not

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change in the mid-1930s, the increased power of the Treasury to determine the direction of policy, along with the departure from gold and the new “technology” for monetizing government debt, produced a new (albeit small) inflationary bias in monetary policy that lasted until the Treasury–Federal Reserve Accord of 1951.

The second half of the paper focuses on the postwar era. The Fed regained some independence with the accord of 1951 and became increasingly aware of the inflationary potential of excessive monetary growth. The Fed failed to break with its traditional (predepression) operating methods, however, and the procyclical bias in these procedures—along with pressures to monetize government debt—explains how the Fed stumbled into an inflationary policy in the 1960s.

Such a policy could not have been sustained under the gold standard as it existed before the depression. Under that regime, an incipient excess supply of dollars would have produced gold outflows, signaling the need for monetary contraction. Under the new dollar standard of Bretton Woods, the inflationary bias in monetary policy remained latent until it had gathered substantial momentum. That momentum, in turn, caused the external imbalance that underlay the collapse of the Bretton Woods system in the 1970s and the abandonment of external constraints on domestic monetary policy. The most important legacy of the Great Depression for monetary policy was thus its initiation of America’s departure from the gold standard.¹

Thus the institutional changes occurring between 1932 and 1935 mattered in two ways. First, they had immediate consequences for monetary policy, largely via the temporary increase in the power of the Treasury. Second, depression-era changes removed preexistent checks on inflationary tendencies in monetary policy. These “latent” consequences became important in the 1960s.

Our analysis of the Fed’s powers, policy intentions, and effects relies as much on qualitative historical evidence—Federal Open Market Committee (FOMC) minutes and the like—as on statistical evidence of breaks or turning points in relevant time series. The two approaches are complementary. For example, statistical evidence is essential for documenting the timing of changes in free reserves, money, and inflation in the 1960s and the role of policy in producing inflation; but without qualitative evidence of policymakers’ intentions, it would be difficult to distinguish intended from unintended outcomes or to explain the timing of important statistical changes.

1. Our discussion is somewhat at odds with the counterfactual modeling of the gold standard by Bordo and Eichengreen (chap. 12 in this volume). As we will argue below, we believe that going off the gold standard in 1933 produced a fundamentally different, and more persistent, departure than going off the gold standard during wartime. Thus, while we believe that the United States probably would have left gold in 1941 even if it had remained on gold in 1933, we will argue that a hard-money standard would have been restored after the war and would have persisted long afterward.

A qualitative historical approach to identifying important turning points in policy is particularly useful for understanding the influence of latent institutional changes—those exerting their influence on policy outcomes only after long delays or under particular circumstances. For example, the long-run inflationary potential of the decoupling of the dollar from the gold standard that began in 1932 was not immediately visible in any data from the 1930s and became relevant later only under a particular combination of circumstances.

Our historical approach eschews purely theoretical analyses of Fed policy shifts based either on welfare economics or on political economy. While such considerations surely play a part in our history, we believe that the role of theory for understanding policy changes is limited. In many cases, the outcomes of policy are different from the intent of policymakers. While economic or political economic influences may shape the intent of policy, institutional constraints and mistaken beliefs of policymakers place a wedge between intents and outcomes. The origins of the inflation of the 1960s, for example, should not be traced to shifts in economic or political fundamentals affecting the taste for inflation. Nor was inflation an inevitable consequence of the departure from gold. Rather, it reflected the combination of economic circumstances, traditional (flawed) policy rules, new theories about the role of government in the economy, and the absence of gold standard discipline, which together produced an unintended inflation.

1.1 Monetary Policy during the Great Depression and Before

To gauge how the Great Depression might have altered monetary policy making, we first review monetary policy during the depression. By almost any measure, the monetary policy of 1930–33 was a disaster: the money supply and price level both fell by one-third, *ex post* real interest rates rose well into double digits, and banks failed by the thousands. How could the Fed have let this happen?

Explanations for the Fed's disastrous monetary policy during the Great Depression largely fall into two categories. One attributes policy failures to innocent mistakes or neglect, while the other contends that the Fed willfully engineered contractionary monetary policy to foster bureaucratic objectives, or in response to interest group pressure. Although some political scientists and public choice economists favor the latter explanation (e.g., Epstein and Ferguson 1984; Anderson, Shughart, and Tollison 1988), most economists and economic historians blame the Fed's policy on misguided policy rules, as well as on petty jealousies that limited the Fed's ability to respond decisively to rapidly changing conditions.

The most prominent explanation of Federal Reserve behavior during the Great Depression is that of Friedman and Schwartz (1963), who argue that a distinct shift in policy occurred with the death in 1928 of Benjamin Strong, governor of the Federal Reserve Bank of New York. Like Fisher (1935) before

them, Friedman and Schwartz (1963) contend that Strong understood how to employ the tools of monetary policy to minimize cyclical fluctuations in output and prices and to prevent or limit financial panics. His death created a void of both leadership and understanding that left the Fed unresponsive to financial crises, bank runs, and their contractionary effects.

Under Strong's leadership, the Fed had used the tools at its disposal to conduct an activist monetary policy aimed at both domestic and international objectives (Wheelock 1991). Large open market purchases and discount rate reductions in 1924 and 1927 were apparent attempts both to encourage domestic economic growth and to enable Great Britain to attract gold reserves. Open market sales and discount rate hikes in 1928 and 1929, on the other hand, were intended to discourage stock market speculation, which at least some Fed officials viewed as a manifestation of inflation.

On the surface, the Fed seems to have been less responsive to the depression than it had been to earlier, smaller, cyclical downturns. Although the Fed made some open market purchases and discount rate adjustments between 1929 and 1933, relative to the declines in output and prices these operations were small in comparison with those of the 1920s.

Despite the Fed's apparent lack of vigor between 1929 and 1933, however, some researchers argue that policy changed little, if at all, with Benjamin Strong's death (e.g., Wicker 1966; Brunner and Meltzer 1968; Wheelock 1991). Monetary policy between 1929 and 1933 appears largely consistent with the policy strategy Strong outlined in the 1920s (Wheelock 1991). That strategy used borrowed reserves and market interest rates as short-run control variables, or policy "instruments."² When member banks borrowed relatively little from Federal Reserve Banks or market interest rates were unusually low, Fed officials interpreted monetary conditions as "easy." Conversely, high levels of borrowed reserves or high interest rates signaled that money was "tight." Once the depression began, both borrowed reserves and interest rates fell sharply and generally remained low, giving Fed officials the impression that money was "cheap" and plentiful.³

Many economists have noted that rigid use of borrowed reserves or interest rates as policy instruments will cause the money supply to rise and fall procyc-

2. The use of open market operations for objectives other than to secure earning assets evolved in the early 1920s, but their use to manipulate instruments or operating targets, such as borrowed reserves, evolved only gradually as the Fed gained experience. Well into the depression, directions to the Fed's trading desk from the FOMC specified the dollar amounts of securities the desk was authorized to buy or sell. By 1932, however, discussion at FOMC meetings turned more toward the desired level of excess reserves and focused less on the specific dollar volume of securities to buy or sell. Later in the 1930s, the committee targeted yields on Treasury securities, as well as excess reserves.

3. Borrowed reserves increased markedly in the fourth quarter of 1931, when the United States suffered a large outflow of gold following Britain's abandonment of the gold standard. Fed officials understood that money was tight but did not make significant open market purchases. The Fed publicly justified its policy by a lack of gold reserves. Wicker (1966) argues that officials feared exacerbating gold outflows by pursuing "inflationist" policies.

clically because borrowed reserves and interest rates are positively correlated with economic activity. Moreover, Wheelock (1991) finds that the banking crises of 1929–33 made borrowed reserves an especially poor indicator of monetary conditions during the depression because the crises made banks reluctant to borrow. Although a few system officials questioned the reliability of borrowed reserves as a policy guide during the depression, the prevailing view was that monetary conditions were exceptionally easy and that the economy's failure to expand was not the fault of monetary policy. We cannot say for certain whether monetary policy would have been different between 1929 and 1933 had Benjamin Strong lived, but it does seem to have been consistent with Strong's response to business cycle downturns in 1924 and 1927 and with the guidelines for assessing the stance of monetary policy he had outlined.⁴ But no matter what one's view of the importance of Strong's death, this much is clear: if the Great Depression was a watershed for monetary policy, the reason was not that it made policy active or responsive to the business cycle, for the Fed had long had such a policy.

1.2 Institutional Changes of the 1930s

The year 1932 marked the beginning of a series of institutional reforms with potentially large consequences for monetary policy (table 1.1). Among the most significant were the Glass-Steagall Act of 1932, which permitted the Federal Reserve to use government securities to back its note issues; suspension of the international gold standard by executive order on 6 March 1933 (ratified by Congress on 9 March); the Thomas amendment to the Agricultural Adjustment Act of 1933, which, among other things, permitted the Federal Reserve to adjust commercial bank reserve requirements; the Gold Reserve Act of 1934, which authorized the president to fix the dollar price of gold and established the Treasury's Exchange Stabilization Fund; and the Banking Act of 1935, which markedly altered the structure of the Federal Reserve System and expanded the Fed's authority to adjust reserve requirements.

By permitting the backing of Federal Reserve note issues with U.S. government securities, the Glass-Steagall Act of 1932 removed an important constraint on discretionary monetary policy. The Federal Reserve Act (as amended in 1917) had required the Reserve Banks to maintain gold reserves equal to 40

4. We make no attempt here to consider all aspects of monetary policy between 1929 and 1933 or the extent to which it was consistent with Strong's policies. Meltzer, however, reaches many of the same conclusions about the failure of monetary policy during the Great Depression that we do, writing that "the main reason for the failure of monetary policy in the depression was the reliance on an inappropriate set of beliefs about speculative excesses and real bills. This set of beliefs, embodied in the Riefler-Burgess framework, directed attention to short-term market interest rates and member bank borrowing and encouraged their use as indicators of the magnitude and direction of monetary policy" (1994, 15). See Wheelock (1991) for analysis of the consistency issue, and the references therein for general histories of Federal Reserve policy during the 1920s and early 1930s.

Table 1.1 Key Institutional Changes in Monetary Policy during the Early 1930s

1932	<i>Glass-Steagall Act</i> (27 February): temporarily made U.S. government securities eligible collateral for Federal Reserve note issues, thereby expanding the Fed's ability to make open market purchases (made permanent in 1933); also temporarily relaxed rules on discount-window lending (extended in 1933, made permanent in 1935)
1933	<i>Emergency Banking Act</i> (9 March): ratified suspension of the gold standard <i>Thomas amendment to Agricultural Adjustment Act</i> (12 May): authorized the Fed to set reserve requirements; gave the president authority to require open market purchases by the Fed, and to fix the weights of gold and silver dollars <i>Banking Act of 1933</i> (16 June): enhanced Federal Reserve Board control of discount-window lending; made technical adjustments to Federal Reserve System organization
1934	<i>Gold Reserve Act</i> (30 January): authorized transfer of monetary gold stock to the U.S. Treasury; amended the president's authority to fix dollar prices of gold and silver; established the Exchange Stabilization Fund <i>Silver Purchase Act</i> (19 June): authorized the president to purchase and nationalize monetary silver; authorized limited Fed lending to industrial and commercial firms
1935	<i>Banking Act of 1935</i> (23 August): reorganized Federal Reserve's Open Market Committee and otherwise enhanced the authority of the Board of Governors of the Federal Reserve System relative to the Federal Reserve Banks; extended Fed authority to adjust member bank reserve requirements

percent of their note issues (and 35 percent of their deposit liabilities), with the remaining 60 percent in the form of either gold or "eligible paper," consisting mainly of commercial loans that banks could rediscount or sell outright to the Reserve Banks. The Federal Reserve Act authorized the Reserve Banks to purchase government securities but did not permit their use as collateral for Fed liabilities. The Glass-Steagall Act of 1932 expanded the definition of "eligible paper" to include U.S. government securities in the Fed's portfolio, thereby enhancing the Federal Reserve's ability to initiate transactions that monetized government debt.⁵ Although he lent his name to the enabling legislation, Carter Glass, who had sponsored the original Federal Reserve Act, apparently voiced considerable worry about the inflationary potential of permitting government obligations to serve as collateral for Federal Reserve notes

5. Previously, member commercial banks could use government securities as collateral for discount-window borrowing, and during World War I the Fed offered a preferential discount rate on such borrowing, with the effect of substantially monetizing the fiscal deficit. These transactions, however, were initiated by commercial banks, rather than by the Federal Reserve.

(Chandler 1971, 189). We argue below that Glass was prescient in his concerns.⁶

Suspension of the gold standard removed another substantial barrier to discretionary monetary policy. Although the Gold Reserve Act of January 1934 restored gold convertibility for international payments to other gold standard countries, the gold standard imposed no constraint on money supply growth through the remainder of the 1930s. Countries that remained on the gold standard at their predepression par levels, such as France, tended to lose gold to the United States and other countries until finally devaluing or going off gold themselves. The coming war in Europe also precipitated gold flows to the United States. Thus, after 1933 the United States was never forced to restrict money growth or raise interest rates to protect its international reserves.

Before 1933, the Federal Reserve, like many central banks, failed to play consistently by the rules of the gold standard. The Fed sterilized gold flows, allowing offsetting changes in other components of bank reserves in the face of gold inflows or outflows. Twice, however, the Federal Reserve reacted to international gold flows in a manner consistent with restoring "external balance." On those occasions, between November 1919 and June 1920, and during September and October 1931, Fed officials believed that gold outflows threatened their own reserve position. On each occasion, the Fed increased its discount rate and maintained it at a high level until the crisis had passed, and each time the policy was sharply contractionary. The Fed clearly believed that the perceived long-term benefits of defending the gold standard were worth the short-term contractionary impact of a defense of their reserve position (Wheelock 1991).

The Roosevelt administration, by contrast, was willing to relax the gold standard to permit reflation. Roosevelt suspended gold payments by executive order on 6 March 1933, which the Emergency Banking Act ratified on 9 March. On 10 March Roosevelt prohibited private transactions in gold and foreign exchange unless licensed by the secretary of the treasury. On 5 April, Roosevelt ordered private individuals and banks to deliver their holdings of gold to Federal Reserve Banks for transfer to the U.S. Treasury and prohibited future use of gold for domestic transactions and private ownership of gold.

The Gold Reserve Act of January 1934 authorized the president to fix the dollar price of gold for international payments, which Roosevelt did at \$35 per ounce (in contrast to the previous parity of \$20.67 per ounce). The United States thus returned to the gold standard for the settlement of international payments with other countries also on the gold standard. The restored gold standard, however, differed fundamentally from the previous standard in the degree to which its operation was removed from private markets and placed

6. The Glass-Steagall Act of 1932 was intended as an expedient to ensure that sufficient Federal Reserve notes could enter circulation in an emergency. It was set to expire after one year but was made permanent in March 1933. The Glass-Steagall Act of 1932 should not be confused with the Banking Act of 1933, which is commonly referred to as the "Glass-Steagall Act."

under control of government authorities. Gold was no longer regarded as an absolute exogenous check on government manipulation of the supply of money. Under the weight of the Great Depression, the ideology of the gold standard, which viewed gold as fundamental to a country's economic prosperity, had cracked. Although the dollar remained linked to gold, the link was weakened and, perhaps more important, government authorities had demonstrated a willingness to manipulate the gold standard to limit the extent to which it would interfere with discretionary monetary policy. Thereafter, when the Fed's gold reserve requirement threatened to limit money supply growth, the reserve requirements were reduced and then eliminated with apparently little debate or fanfare.⁷ The gold standard as it existed after 1933 was thus fundamentally different from its precursor and foreshadowed the Bretton Woods gold standard that was to replace it after World War II.⁸

In addition to marking a fundamental shift in the degree to which gold served as a constraint on domestic monetary policy, the revaluation of gold in 1934 left the U.S. Treasury with a capital gain of some \$2.8 billion on its gold holdings. Under authority conveyed by the Gold Reserve Act of 1934, the Treasury used \$2 billion of its windfall to establish the Exchange Stabilization Fund: "For the purpose of stabilizing the exchange value of the dollar, the Secretary of the Treasury . . . is authorized . . . to deal in gold and foreign exchange and such other instruments of credit and securities as he may deem necessary."⁹

Although the operations of the Exchange Stabilization Fund during the 1930s had little effect on the quantity or growth of bank reserves, the size and open-ended authority of the fund was widely viewed as a threat to the Federal Reserve System and its ability to effect monetary policy. For example, Roy Young, then governor of the Federal Reserve Bank of Boston, argued that the Gold Reserve Act "gives the Secretary of the Treasury such powers, of a permanent nature, that he could nullify anything we [the Federal Reserve] could do" (quoted in Johnson 1939, 36). The *Commercial and Financial Chronicle* had a similar reaction: "The Reserve authorities have been reduced to shadowy nonentities, the Federal Reserve System having become simply an adjunct of the United States Treasury and the Federal Government, to do what they are told to do" (20 January 1934, 367).

In addition to the Exchange Stabilization Fund, authorities granted the president and treasury secretary included the right to "request" the Federal Reserve to use open market purchases to increase bank reserves by up to \$3 billion and,

7. E.g., the Fed's gold reserve requirement was reduced from 40 percent (against its note issues) and 35 percent (against deposits) to 25 percent in 1945. Foreshadowing the ultimate collapse of the Bretton Woods system, the reserve requirement against deposits was eliminated in 1965 and that against Federal Reserve notes was eliminated in 1968.

8. Friedman and Schwartz write that "perhaps the best description of the role of gold in the United States since 1934 is that, rather than being the basis of the monetary system, it is a commodity whose price is officially supported in the same way as the price of wheat, for example, has been under various agricultural programs" (1963, 472).

9. See Schwartz (1997) for a history of the Exchange Stabilization Fund.

if the Fed refused, to issue a commensurate amount of fiat currency. This power was granted by the Thomas amendment to the Agricultural Adjustment Act of 1933, which, along with the Silver Purchase Act of 1934, also authorized the purchase of silver and permitted the president to devalue the silver dollar. Between 1933 and 1938, the Treasury purchased 1.8 billion ounces of silver, thereby increasing bank reserves by \$1 billion (some 20 percent of the total increase in reserves during the period). Had the president chosen to devalue the dollar in terms of silver, the Treasury would have reaped a \$2.2 billion windfall on its silver holdings (Johnson 1939, 195–98). In summarizing the various new authorities given the administration, Johnson concludes, “The President could double or triple bank reserves, had complete discretion over the gold value—and consequently the foreign exchange value—of the dollar, and could establish bimetalism by proclamation, in other words, he could completely refashion the monetary system of the country, and the sole criteria required were his own subjective evaluations of the situation” (1939, 202). In the event, the president never invoked his authority to “request” Federal Reserve purchases or to devalue the silver dollar—he did not have to since Treasury pressure generally kept the Fed in line.

Organizational changes to the Federal Reserve System may have contributed to the Fed’s willingness to accept the Treasury’s desired monetary policy. The authors of the Federal Reserve Act agreed that the Federal Reserve System should not be a “central bank” on the European model, but a federal system of semiautonomous Reserve Banks with an overseeing board. Dissatisfaction with the subsequent performance of the Federal Reserve, both during the 1920s and during 1929–33, led to reforms that enhanced the authority of the Federal Reserve Board at the expense of the Reserve Banks. Marriner Eccles accepted the chairmanship of the Federal Reserve Board in 1933 with the understanding that he would have freedom to redesign the Federal Reserve System. His reforms included limits on the power of the Federal Reserve Bank of New York, which he viewed as an instrument of the private interests of New York bankers, and measures to ensure oversight and coordination of the activities of the regional Reserve Banks in pursuit of the national interest (Eccles 1966, 170–72).

Under Eccles’s plan, which the Banking Act of 1935 substantially brought into effect, the Board of Governors was given substantial control over open market operations and Federal Reserve Bank discount rates. The FOMC was reconstituted to include all seven members of the Board of Governors and just five of the twelve Reserve Bank presidents.¹⁰ The legislation thereby increased the authority and stature of the Federal Reserve officials located in Washington

10. The Banking Act of 1935 also changed the titles of the chief executive officers of the Federal Reserve Banks from the more prestigious “governor” to “president,” while discontinuing the Federal Reserve Board in favor of the Board of Governors, whose members all held the title “governor.” The Board of Governors was further authorized to approve the appointments of Federal Reserve Bank presidents and first vice presidents, and to generally supervise Reserve Bank operations.

and appointed by the president. On the other hand, it also sought to limit the influence of the president by removing the secretary of the treasury and comptroller of the currency as *ex officio* FOMC members. With his reforms, Eccles intended that monetary policy would be made by professionals whose allegiance was solely to the national interest. As we will discuss below, however, these changes increased political pressures on the Fed at the same time that establishment of the Exchange Stabilization Fund and other measures increased the administration's power to conduct monetary policy. Consequently, these reforms shifted power away from the Fed toward the Treasury and promoted an inflationary bias in monetary policy.

1.3 Monetary Policy after the Contraction

The Federal Reserve lay nearly dormant between April 1933 and February 1936, when the structural changes to the Federal Reserve System imposed by the Banking Act of 1935 took effect. Between April and December 1933, however, the Fed did buy nearly \$600 million of government securities, which, along with currency inflows, increased member bank reserves by some \$700 million. The Fed made no further changes to the size of its open market portfolio until 1937. The Fed also permitted discount-window loans outstanding to fall from some \$100 million at the end of 1933 to less than \$10 million at the end of 1934, where they remained for the rest of the decade.

Over time, Fed officials became increasingly concerned about substantial increases in bank reserves, especially excess reserves. During 1934 and 1935, gold inflows of some \$3 billion contributed to a doubling of member bank total reserves (from \$2.76 billion in January 1934 to \$5.72 billion in December 1935) and more than a tripling of excess reserves (from \$866 million to \$2.98 billion; Board of Governors of the Federal Reserve System 1943, 371). The buildup of excess reserves alarmed Fed officials, who feared that these "idle" balances might permit a wave of speculation and inflation.

Using its traditional tools the Fed would have reduced reserves (or slowed their rate of growth) by selling securities and raising the discount rate. But this was not feasible in the mid-1930s. A discount rate increase would have had no effect on reserves since discount-window borrowing already was trivial, even at a discount rate of just 1.5 percent. Similarly, by mid-1935, member bank excess reserves alone equaled the Fed's total security holdings, leaving the Fed unable to slow significantly the growth of total reserves through open market sales.

The Fed was given an important new policy tool, however, by the Thomas amendment to the Agricultural Adjustment Act of 1933, which permitted the Fed to alter member bank reserve requirements with the approval of the president. The Banking Act of 1935 broadened the Fed's authority by permitting the Board of Governors to alter reserve requirements within certain limits independently "in order to prevent injurious credit expansion or contraction." With

its traditional means of monetary control becoming ineffective, the Fed came to rely on reserve requirements for regulating the supply of money and credit. The system's first major policy initiative after 1933 was to increase reserve requirements in three steps in 1936 and 1937.

1.3.1 The Reserve Requirement Increases of 1936 and 1937

Alarmed at the sharp increase in excess reserves that had taken place since 1933, and viewing it as potentially inflationary, the Board of Governors increased required reserve ratios in August 1936, and again in March and May 1937. In total, the reserve requirements on time deposits were increased from 3 percent to 6 percent. Requirements on demand deposits were increased from 7, 10, and 13 percent to 14, 20, and 26 percent for country, reserve city, and central reserve city banks, respectively. The increases, according to the *Annual Report of the Board of Governors* for 1936, were intended to eliminate those excess reserves the board deemed "superfluous for prospective needs of commerce, industry, and agriculture, and, if permitted to become the basis of a multiple expansion of bank credit, might have resulted in an injurious credit expansion" (14).

We find certain aspects of monetary policy between 1936 and 1938 striking, both in how the practice of monetary policy had changed and in how it had not changed since 1933. Gold inflows had made the old tools of monetary policy—the discount rate and open market operations—ineffective, and so the Fed used its new tool—reserve requirements. In raising reserve requirements, however, the Fed sought to restore the effectiveness of the discount rate and open market operations: "With excess reserves reduced to a manageable figure, the Reserve System would be in a position to take prompt action to bring about current adjustments of the reserve position of member banks to credit needs by employing the more flexible instrument of open-market operations to ease or tighten conditions in the money market" (Board of Governors, *Annual Report* 1937, 5). In other words, by reducing the amount of excess reserves (and thereby increasing the Fed's security holdings relative to excess reserves), the Fed sought to make usable its traditional tools—open market operations and the discount rate—in the future if contractionary moves became desirable.

A second objective of the reserve requirement increases of 1936 and 1937 was to limit the banking system's ability to increase loans and deposits without Fed acquiescence. The Fed interpreted the excess reserves of commercial banks as largely superfluous balances with inflationary potential. The Fed wrote in its annual report for 1936 that "in raising reserve requirements it was not the intention of the Board to reverse the policy of monetary ease which has been pursued by the System since the beginning of the Depression" (Board of Governors 1936, 15). By reducing excess reserves, the Fed sought to move from a policy stance that it viewed as dangerously easy to one that was sufficiently easy to promote continued, but noninflationary, economic growth. From this perspective, the reserve requirement hikes of the mid-1930s are best

seen as an attempt by the Fed to prevent banks from being the engine of inflation and to return to a status quo in which its traditional rules of thumb and traditional policy tools could be used as before.

The Fed's policy was similar to previous policies in two respects. First, Fed officials judged the stance of monetary policy with the same indicator—free reserves (excess less borrowed reserves)—that they had used to gauge monetary conditions during the early 1930s and before. Second, in seeking to prevent inflation (which they defined broadly to include “speculation”), policymakers were influenced by a view that excessively easy monetary policy in the 1920s had fueled financial speculation and produced the stock market crash and depression. Extreme proponents of this view held that the Fed should withdraw credit during recessions so as to discourage renewed speculation or inflation and hasten a process of liquidation that they deemed a prerequisite of recovery. Although a majority of Fed policymakers, both during 1929–33 and later, decided to encourage economic recovery by promoting monetary ease, the “liquidationist” view undoubtedly influenced the ultimate outcome of Fed deliberations both early in the depression and after 1935.

1.3.2 The Free Reserves Policy Guide

Throughout the 1920s and 1930s the Fed used free reserves as its main guide to monetary conditions. Free reserves is the difference between excess and borrowed reserves, but because banks held little or no excess reserves before the depression, officials spoke of monetary conditions in terms of borrowed reserves. For example, in 1926, Benjamin Strong suggested that

as a guide to the timing and extent of any [open market] purchases which might appear desirable, one of our best guides would be the amount of borrowing by member banks in principal centers. . . . Our experience has shown that when New York City banks are borrowing in the neighborhood of 100 million dollars or more, there is then some real pressure for reducing loans, and money rates tend to be markedly higher than the discount rate. . . . When member banks are owing us about 50 million dollars or less the situation appears to be comfortable, with no marked pressure for liquidation. (Quoted in Chandler 1958, 239–40)

The Fed's lack of vigor in responding to the depression between 1929 and 1933 was largely consistent with the policy guidelines Strong outlined. Member bank borrowed reserves plummeted during 1930 and 1931, and again after gold outflows and the banking panic in the fourth quarter of 1931 had subsided. In addition, for the first time, banks accumulated significant excess reserves. Some system officials argued that monetary conditions had been made too easy—that the Fed was pushing reserves on a saturated market and thereby delaying needed and inevitable economic adjustments.

Free reserves continued to serve as the Fed's principal indicator of monetary conditions in the mid-to-late 1930s, though because banks borrowed almost

no reserves after 1933, monetary conditions were measured in terms of excess reserves. At an FOMC meeting in September 1937, E. A. Goldenweiser, the Fed's chief economist, recalled Strong's rule of thumb that monetary conditions were neutral when New York City banks were borrowing \$50 million of reserves from the Fed. Now, Goldenweiser claimed, a neutral policy stance was achieved when New York City banks held \$250 million of excess reserves and all banks held \$700–\$800 million of excess reserves (FOMC, *Minutes* 11 September 1937).¹¹ Goldenweiser's redefinition of monetary neutrality to be a free reserve position of New York banks some \$300 million higher than in the past undoubtedly reflected the experience of intervening years, including, perhaps, an understanding that banks held excess reserves as a long-run portfolio choice (compensating for a decline in bank capital). Free reserves, however, remained the metric for judging monetary conditions. Total reserves, the monetary base, the money supply, and real interest rates were scarcely considered.

1.3.3 The "Liquidationist" Policy View

The Fed's use of free reserves as its principal policy guide during 1936 and 1937 was consistent with previous policy. We also find precedent in the claim of many policymakers during 1936 and 1937 that excess reserves were superfluous, even dangerous. Between 1930 and 1933, some Fed officials argued that monetary conditions were excessively easy—that money was even "sloppy." Chandler (1971) describes two schools of thought prevailing among system officials in the early 1930s. One school, which Chandler terms the "accommodationists," believed that during a recession the Fed should accommodate recovery by promoting monetary ease, defined as low interest rates and little discount-window borrowing. The other school, termed the "liquidationists," believed that monetary ease interfered with recovery by delaying inevitable adjustments of prices, wages, and resource utilization that are necessary before a sustainable recovery can begin. Between 1930 and 1933, Fed officials rarely debated whether monetary conditions could be described as "easy" but frequently considered whether monetary ease was the appropriate policy to follow.

Proponents of the liquidationist view tended to blame the depression on financial speculation that, they argued, the Fed had supported with easy money policies during recessions in 1924 and 1927. As Adolph Miller, a member of the Federal Reserve Board, put it, open market purchases had been made in 1927 during "a time of business recession. Business could not use and was not asking for increased money at that time" (Miller 1931, 134). It was commonly believed, both within and outside the Fed, that the volume of Federal Reserve

11. The *Minutes of the Federal Open Market Committee* are not verbatim transcripts, but rather summaries of the discussion, sometimes with attribution and sometimes not. For exposition, when we quote directly from the *Minutes*, we put such text in quotation marks and attribute the text to the individual referred to in the *Minutes*. It may be, however, that the quote is not the exact statement of the individual.

credit outstanding would be appropriate if extended only at the initiative of commercial banks in the rediscount of short-term commercial paper (the “real bills doctrine”). Accordingly, Fed credit should contract during recessions, when the demand for commercial loans fell and thus when banks required fewer reserves. This explains why officials of the Federal Reserve Bank of Richmond responded as follows to a question from the Senate Banking Committee in 1931 about the system’s open market purchases in 1924 and 1927: “We think United States securities should not have been purchased in these periods, and the aim should have been to decrease rather than augment the total supply of Federal Reserve credit” (U.S. Senate 1931, 817). Like Miller, these officials believed that open market purchases supplied reserves that were unneeded to support productive loans and, hence, fueled the speculation that ultimately and inevitably led to a crash and depression.¹²

Opponents of open market purchases during the depression often warned that not only would monetary ease prolong the downturn but it might reignite speculation. For example, Frederic Curtis, chairman of the Federal Reserve Bank of Boston, opposed open market purchases “on the ground that they were likely to feed the stock market rather than the bond market” (quoted in Friedman and Schwartz 1963, 373). And James McDougal, governor of the Federal Reserve Bank of Chicago, warned that if open market purchases did not reignite stock market speculation, they might fuel speculation “in some other direction” (371). Still another view was put forward by the governor of the Federal Reserve Bank of Philadelphia at a meeting of the FOMC in September 1930:

We believe that the correction must come about through reduced production, reduced inventories, the gradual reduction of consumer credit, the liquidation of security loans, and the accumulation of savings through the exercise of thrift. These are slow and simple remedies, but just as there is no “royal road to knowledge,” we believe there is no short cut or panacea for the rectification of existing conditions. . . . We have been putting out credit in a period of depression, when it is not wanted and could not be used, and will have to withdraw credit when it is wanted and can be used. (Quoted in Chandler 1971, 137)

The views of Miller, McDougal, and other liquidationists did not dominate the Fed during the 1930s, but they were heard and probably kept the system from responding more vigorously to the depression.

Many of the most vocal critics of easy money policies in the 1920s, such as Miller, were no longer in the system in 1936 and 1937, when reserve requirements were being debated. Still, the view remained among policymakers that

12. Although today many of the liquidationist arguments may seem strange, under the gold standard the price level tended to be stationary, and thus, there is logic in the view that an inflation would be followed at some point by deflation, and the greater the inflation, the deeper the deflation.

the depression had been in large part caused by financial speculation and the stock market crash. Many officials believed that the Fed was too slow to check speculation in 1928 and 1929, and the consequences of not reacting quickly and decisively to nip speculation in the bud was one lesson these individuals took from the depression. This view might explain why in January 1937 Goldenweiser advocated further increases in reserve requirements, despite noting that unemployment remained high. He argued that it was better to check “unsound and speculative situations” in their early stages while control is still possible, with now being that time (FOMC, *Minutes* 26 January 1937). The board gave a similar explanation for the timing of the reserve requirement increases in its annual report for 1937: “Notwithstanding the fact that recovery was far from complete and that there was still a large amount of unemployment, boom conditions were developing in particular industries and boom psychology began to be manifested” (Board of Governors 1937, 2).

To summarize, we find that the Fed’s methods of interpreting the stance of its policy, as well as the fears policymakers had about potential future financial speculation and inflation, changed little between the two halves of the 1930s. In each period, Fed officials sought to achieve a degree of monetary ease that would promote economic recovery but not reignite the sort of inflation or speculation that they thought might hasten another collapse. In 1926, Strong advocated a borrowed reserves total of \$50 million as an appropriate free reserves target during a recession. His replacement at the New York Fed, George Harrison, advocated a target for excess reserves of \$250 million at a meeting of the FOMC in July 1932 (cited in Chandler 1971, 200). And, finally, at a FOMC meeting in March 1937, Marriner Eccles argued that \$500 million of excess reserves would make “ample funds available for legitimate business use” (FOMC, *Minutes* 15 March 1937). The target level was thus changed from time to time, but never the fundamental policy framework. We conclude therefore that the first major policy initiative following the revamping of the gold standard regime and the restructuring of the Federal Reserve System between 1933 and 1935 reflected remarkably little change in the Fed’s goals or tactics.

1.3.4 The Recession of 1937 and 1938

The doubling of reserve requirements between 1936 and 1937 suggests the absence of an inflation bias in monetary policy and even raises the question of whether the Great Depression created a *deflationary* bias—an excessive concern with containing speculation that inspired contractionary policy in 1936 and 1937. We think that such a view is not warranted by the intent or consequences of Fed actions in those years. The Fed was willing to double reserve requirements when the unemployment rate was well over 10 percent and the price level and real output stood far below their 1929 levels, but the Fed did not see itself as initiating a contraction of credit. Rather it sought to prevent a future expansion of credit that threatened to bring inflation and also derail eco-

nommic recovery. Even after reducing excess reserves by some \$2 billion, the Fed believed that monetary conditions would remain easy, with ample reserves available to support continued economic growth.¹³

A recession did follow the reserve requirement increases, however, and the Fed received considerable criticism from both contemporaries and more recent analyses of monetary policy. For our purposes, the Fed's intent and its perceptions of policy are more important than the impact of the reserve requirement increases, although elsewhere we argue that the reserve requirement increases of 1936 and 1937 did not precipitate the recession of 1937 and 1938 (Calomiris and Wheelock 1996; see also Frost 1971; Currie 1980; Calomiris and Wilson 1996).

1.3.5 Treasury Pressure and an Easing of Policy in 1937 and 1938

We have argued that Federal Reserve policy in 1936 and 1937 did not reflect a major change in system goals or targets. Nevertheless, New Deal reforms enhancing the administration's ability to influence monetary policy affected Federal Reserve behavior in the 1930s and, in concert with fundamental changes in the gold standard, undermined stationarity of the price level over the long term. The Banking Act of 1935 removed the secretary of the treasury from the Federal Reserve Board but gave the newly formed Board of Governors majority control of the FOMC. Previously, the 12 Reserve Bank presidents had formed the FOMC and the board's role had been limited to an ambiguous supervisory role. The Banking Act of 1935 put control over open market policy in the hands of officials appointed by the president. Furthermore, only those members of the Federal Reserve Board who had been Roosevelt appointees were placed on the new Board of Governors.

The new FOMC structure was a compromise between Eccles's original plan, under which open market policy would have been vested solely in the Board of Governors, and that of Carter Glass, who argued that open market operations should remain the province of the Reserve Banks. Treasury Secretary Morgenthau favored the ultimate outcome, intending thus to weaken Eccles and the Fed. Referring to the Fed's structure before 1935, Morgenthau concluded in a diary entry that "the way the Federal Reserve Board is set up now they can suggest but have very little power to enforce their will. . . . [The Treasury's] power has been the Stabilization Fund plus the many other funds that I have at my disposal and this power has kept the open market committee in line and afraid of me." Favoring the new makeup of the FOMC committee, Morgenthau wrote in his diary, "I prophesy that . . . with the seven members of the Federal Reserve Board and the five governors of the Federal Reserve

13. Friedman and Schwartz reach a similar conclusion: "Even so drastic a use of that new power [over reserve requirements] does not contradict the view that the Federal Reserve System was following a largely passive policy. The rise in reserve requirements was not imposed primarily to affect current conditions but to enable the System to control future developments it feared might be set in train by the large excess reserves" (1963, 517).

Banks forming an open market committee, that one group will be fighting the other and that consequently they will not be able to do anything constructive, and that therefore if the financial situation should go sour the chances are that the public will blame them rather than the Treasury” (quoted in Blum 1959, 352).

Regardless of how the Federal Reserve System was organized, the Treasury had the power to intimidate the Federal Reserve into carrying out the administration’s policies. By 1936, Morgenthau believed strongly in sterilizing gold inflows to have a weapon to offset outflows should they occur. When Eccles and Morgenthau clashed over whether sterilizing operations should be done at the initiative of the Treasury or the Federal Reserve, Eccles was forced to back down when it became clear that the Treasury had the means and the political capital to conduct policy as it saw fit (see Blum 1959, 360–67).¹⁴

The Banking Act of 1935 eliminated a provision imposed by the Thomas Amendment of 1933 requiring presidential approval of changes in commercial bank reserve requirements. Still, prior to increasing reserve requirements in 1936 and 1937, the Fed consulted President Roosevelt and Treasury Secretary Morgenthau about possible reserve requirement changes.¹⁵ The administration was not pleased, however, with the apparent impact of those increases on the market for government securities and pressured the Federal Reserve into undertaking offsetting open market operations and ultimately reversing a portion of the reserve requirement increase. The Treasury’s new monetary clout set the stage for a decade of explicit Treasury dominance of monetary policy and an even longer period in which its objective of “maintaining stability” of government securities prices remained an important goal of monetary policy.

Following the Fed’s doubling of reserve requirements, Secretary Morgenthau increasingly sought to influence the conduct of monetary policy. At a meeting of the FOMC Executive Committee on 13 March 1937, Chairman Eccles reported that Morgenthau had expressed displeasure about a decline in government bond prices following the 1 March increase in reserve requirements and wanted to know how the Fed intended to rectify the situation. Eccles also reported Morgenthau as saying that the Treasury stood ready to use the Exchange Stabilization Fund, or possibly end its sterilization of gold inflows, to raise bond prices (FOMC, *Minutes* 13 March 1937). Although members of

14. Ordinarily, the Treasury paid for its gold purchases by transferring funds from its Federal Reserve accounts to those of member commercial banks, the effect being to increase aggregate commercial bank reserves. The Treasury could prevent an inflow from affecting reserves, i.e., “sterilize” it, by simultaneously transferring funds from its accounts with commercial banks to those it held with the Federal Reserve. Alternatively, the Treasury could reduce reserves by issuing new debt to the public.

15. Whether Roosevelt and Morgenthau had approved reserve requirement changes is unclear. Some accounts state that they had, while Blum writes that Morgenthau “was taken by surprise on July 15 when he picked up the morning paper and read that the Board of Governors had increased requirements 50 percent” and subsequently had a “blistering” conversation with Eccles about it (Blum 1959, 356–57).

the FOMC agreed that “the drop in prices in the bond market was in the nature of a natural adjustment which was due primarily to non-monetary causes” (FOMC, *Minutes* 13 March 1937, 2), the FOMC Executive Committee met with Morgenthau and assured him of their desire to maintain an “orderly” market for government securities while not pegging prices at specific levels.

On 15 March, the full FOMC met to review the economic outlook and discuss Morgenthau’s criticism of Fed policy. The committee agreed to authorize open market purchases to preempt more invasive action by the Treasury, though Eccles felt that excess reserves remained “ample for legitimate business use” (FOMC, *Minutes* 15 March 1937, 7).¹⁶ Midway through the meeting, Morgenthau telephoned Eccles to find out what the FOMC had decided to do, and Eccles reported that the committee had voted to maintain an orderly market for government securities and make additional open market purchases in the event of an “emergency.”

Over the subsequent week, and under continuing pressure from Morgenthau, Eccles changed his mind. He now regarded previous policy as having been inappropriate and argued that reserve requirement increases had been responsible for declines in government bond prices. Although absent from a meeting of the FOMC Executive Committee on 23 March, Eccles communicated his desire to buy government securities because their yields were “quite out of line” with reasonable levels. Other members of the Executive Committee disagreed, however, deciding that the situation was not an “emergency” and therefore did not meet the criterion established at the 15 March FOMC meeting for increasing the system’s portfolio. A majority of the Executive Committee also argued that open market purchases simply were not needed.

At the FOMC meeting of 3 April, Eccles relayed Morgenthau’s continued displeasure with weakness in the government bond market. He indicated that Morgenthau had requested the cancellation of the third increase in reserve requirements, set for 1 May, and had threatened to sterilize \$500 million of gold, thereby increasing commercial bank reserves by that amount. Morgenthau also indicated, however, that the Treasury would not act if the Fed bought securities in the open market.

Eccles proposed that the Fed make the open market purchases Morgenthau wanted, claiming that the increases in required reserve ratios had “drastically” reduced excess reserves and that “it would take the banks some time to accus-

16. Suggesting the tone of Morgenthau’s meetings with Eccles, Morgenthau claims to have told Eccles at one point that

the President suggested that I should say to the Federal Reserve: “Now Congress gave you the job of managing the money market and that is your responsibility. You muffed it. You haven’t done it. You have not maintained an orderly market, and this thing is getting steadily worse. . . . Now I, Henry Morgenthau, Jr., talking for the U.S. Government, serve notice on the Federal Reserve Board that I ask you to do what Congress has given you the power to do, namely, to increase your portfolio. If you don’t do it, the Treasury will step in. . . . We are putting you on notice.” (Quoted in Blum 1959, 373–74)

tom themselves to operating with a smaller amount of excess reserves, as evidenced by the fact that they had sold earning assets rather than reduce their balances with correspondents" (FOMC, *Minutes* 3 April 1937, 7). Eccles went on to argue that open market purchases were justified because the government securities market had been "disturbed" by the increases in reserve requirements.

As the FOMC continued to discuss open market policy and the advisability of proceeding with the third increase of required reserve ratios, their meeting was twice interrupted by calls from Secretary Morgenthau inquiring about the committee's decisions. Following the second call from Morgenthau, a meeting of the FOMC Executive Committee and Morgenthau was arranged for that evening.

The FOMC reconvened on Sunday 4 April, at which time Eccles reported that Treasury Secretary Morgenthau had requested that the Fed support bond prices and stated that the Treasury would take action if the Fed's moves failed to stabilize the market for government securities. Eccles proposed to the FOMC that open market purchases be used to increase the excess reserves of member banks by as much as \$250 million but argued that the board should go forward with plans to increase required reserve ratios on 1 May. Majorities of the FOMC and Board of Governors agreed with these proposals. For Eccles and Morgenthau, the prime motivation for this policy was not a fear of economic contraction, but rather a perceived need to support the price of government securities at a time when the Treasury had a continuing need to float debt. Monetary policy had thus become an instrument of Treasury debt management.

By its 11 September meeting, the FOMC recognized that the economy was slowing, which policymakers attributed to an unusually large seasonal downturn rather than to a recession. Goldenweiser forecast that the excess reserves of New York City banks would soon decline to zero and suggested that a target of \$250 million of excess reserves might be appropriate to maintain a neutral monetary policy. After reviewing their options, the committee agreed that Eccles would propose a policy to Morgenthau in which the Treasury would sterilize gold and the Fed would purchase securities. At a continuation of the FOMC meeting on 12 September, Eccles reported Morgenthau's enthusiasm for the plan, whereupon it was agreed that the Fed would purchase up to \$300 million of securities in conjunction with a sterilization operation of \$300 million by the Treasury.

The Fed's close cooperation with (or capitulation to) the Treasury continued over the autumn and into early 1938. At a meeting of the FOMC on 21 April 1938, Eccles indicated that the Board of Governors had agreed to lower reserve requirements as part of an administration plan for economic stimulus (which also involved sterilization of gold). Goldenweiser explained that the result of the joint action would be to restore excess reserves to a level above where they had been when the first increase in reserve requirements was made in

1936, but at that time the economy had been “booming,” while now there was a “depression” with no end in sight (FOMC, *Minutes* 21 April 1938, 10).

As the details of monetary policy discussions during the mid-to-late 1930s make clear, the Fed faced considerable pressure from the Treasury. Removal of the treasury secretary from the Federal Reserve Board did not eliminate administration influence on monetary policy, while the restructuring of the FOMC probably increased such influence. Perhaps the clearest indication of how this affected policy is revealed by the views of George Harrison, president of the Federal Reserve Bank of New York, who headed the FOMC before 1935 and became its vice chairman in 1935. Between 1930 and 1933, Harrison frequently favored more expansionary open market operations than were accepted by the full committee. During 1936 and 1937, he often disagreed with Eccles and other FOMC members who favored a more conciliatory response to the treasury secretary's call for using open market operations to stabilize the government securities market. Then, during 1938 and 1939, Harrison again disagreed when a majority of the FOMC so feared the appearance of tightening that they opposed letting the Fed's portfolio decline as securities matured. We believe that Harrison's shift from being an FOMC “dove” to being a committee “hawk” reflected not a change in his views, but rather changes in committee membership caused in large part by the restructuring of the Federal Reserve System.

Administration pressure on the Fed also helps explain a shift in the focus of monetary policy away from the markets for private securities, such as commercial paper and bankers acceptances, toward the market for government securities. The depression brought a decline of private economic activity and increased government spending that made the market for government securities larger, both in absolute terms and relative to private markets. More important, the Glass-Steagall Act of 1932 and the absence of a gold standard constraint left monetary policy free to monetize government debt, while diminished Federal Reserve independence made monetization more likely to occur. In effect, deficit monetization was the outcome of the Fed's new policy of stabilizing government securities prices during the late 1930s. The maintenance of high bond prices then became the only policy objective during World War II.

1.4 Federal Reserve Monetary Policy and the Accord

With American entry into World War II, the Federal Reserve announced that it would peg the yield on Treasury bills at 3/8 percent and maintain ceiling yields on government securities of longer maturities of up to 2.5 percent on bonds. The Fed stood ready to buy securities without limit to maintain this pattern of rates, and by June 1946 the system held 85 percent of all outstanding Treasury bills (Federal Reserve *Bulletin*, December 1948, 1400).

The Fed ended its T-bill yield peg in mid-1947 but continued to maintain

ceiling yields on other government securities. Between 1947 and 1949, the Fed was able to maintain this policy without excessive growth of bank reserves or the money supply, but by 1950 inflationary pressures caused the Fed to question the wisdom of holding government security yields artificially low. The Treasury, however, remained firmly committed to funding government debt issues at low cost, a commitment that only hardened with growing tensions in Korea.

Increased government spending, full employment, and the necessity of furnishing bank reserves at an increasingly rapid rate to maintain ceiling yields on government securities prompted concern at FOMC meetings in 1950. On several occasions, the Fed communicated to Treasury officials its view that the Treasury should seek “nonbank” sources for funding their debt issues. In reply, the secretary of the treasury always made clear his view that the Fed’s support of government securities prices was crucial to the financing of federal government spending. Fed officials became increasingly frustrated with Treasury intransigence, and some argued that it was time for the Fed to act independently. For example, at a FOMC meeting on 18 August 1950, Marriner Eccles, who had been replaced as chairman of the Board of Governors in 1948 by Thomas McCabe, argued that he “felt it was time the System, if it expected to survive as an agency with any independence whatsoever, should exercise some independence” (FOMC, *Minutes* 18 August 1950, 12).

On 21 August, the FOMC took Eccles’s advice and decided to allow a rise in short-term interest rates along with a one-quarter percentage point increase in the discount rate to 1.75 percent. This infuriated the Treasury as the Fed’s action came during a major debt-refunding operation. Treasury Secretary John Snyder described the resulting decline in demand for government debt as “a significant financial failure for the Federal Government” (Snyder 1969, 3051). In subsequent FOMC meetings, Fed officials debated whether to continue to buck Treasury policy, with McCabe telling the committee on 11 October that they faced “one of the most important decisions [the FOMC] had been called upon to make” (FOMC, *Minutes* 11 October 1950, 5–6). The Fed continued to argue with Treasury officials that rapid growth of bank reserves and money would cause inflation and do more harm to the market for government securities (via the Fisher effect) than modest increases in market yields attendant on the withdrawal of Fed price support. These arguments fell on deaf ears.

As the treasury secretary’s account of the struggle makes clear, the Treasury and the Fed disagreed about the potential problems of continuing securities price support and the likely consequences of removing Fed support. The Treasury interpreted the Fed’s statements of concern about inflation as a desire to pursue contractionary monetary policy and, in effect, raise real interest rates. The Fed’s main concern, however, was less the current money supply than the money supply process. The Fed felt that automatic conversion of Treasury securities into money at a fixed price would lead to an unsustainable process

of monetization and inflation, which ultimately would lead to higher nominal interest rates.¹⁷

The impasse finally came to a head early in 1951. Following a meeting with the FOMC on 31 January, President Truman issued a statement that the FOMC had agreed to cooperate fully with the Treasury to maintain the current level of interest rates. In fact, the FOMC had made no such commitment. According to the internal Fed account of the meeting, except for asking for the Fed's assurance that it shared his goal of maintaining confidence in the government's credit, Truman seemed unconcerned about minor fluctuations in bond prices (FOMC, *Minutes* 31 January 1951).¹⁸ The White House press release, however, stated that the Fed had agreed to hold government security prices at their current levels as long as international tensions remained high.

Fed officials were much distressed by the White House account of their meeting with the president and again communicated to Treasury officials that the best way to protect the creditworthiness of the government was to prevent inflation. Fed protests led to the formation of a joint Fed-Treasury committee to work out their differences on policy matters. In early March 1951, the Treasury and the Fed reached an agreement, the "accord," which explicitly recognized the Fed's independence and allowed some freeing of government security yields to find their market levels. The Fed's vague commitment to "support" the government securities market suggests that the Fed gave up little to win its independence.

Underlying the Fed's new independence was the growth in its balance sheet and a consequent reduction in the potential importance of Treasury threats. Open market purchases during World War II and in the postwar period had given the Fed considerable scope to alter the level of bank reserves, with Federal Reserve credit outstanding rising from some 16 percent of total member bank reserves in January 1941 to well in excess of total reserves by war's end. Thus, the accord may have merely reflected the Fed's power to forge a more independent policy whether or not the administration approved.

The agreement, however, was not entirely one sided. Coincident with the accord, the Truman administration informed Thomas McCabe, chairman of the Fed's Board of Governors, that he was no longer "effective," in effect calling for his resignation. McCabe's replacement was William McChesney Martin, who had been the Treasury's chief negotiator on the accord. Moreover, as we will show, throughout the 1950s and 1960s the Fed accepted the Treasury's call for low and stable yields on government securities as one objective of its discretionary monetary policy.

17. This discussion draws on Krooss (1969, 3026–71). For a theoretical discussion of the Fed's concerns, see Eichengreen and Garber (1991).

18. According to this account of the meeting, Truman had explained how, as a young veteran of World War I, he had been forced to cash in his Liberty Bonds at 80 cents on the dollar to buy necessities, and "he did not want the people who hold our bonds now to have done to them what was done to him" (FOMC, *Minutes* 31 January 1951, 24–25).

In the postaccord period, however, FOMC discussion and policy statements came to place increased emphasis on the growth of reserves and money, which Friedman and Schwartz (1963, 628) refer to as a “near-revolutionary” change in system policy (see also Ahearn 1963). Perhaps this development came in recognition of how rapid increases in bank reserves and the money supply can cause inflation, or with the Fed’s desire to make clear its intention to forge an independent policy. But, immediately after the accord, the Fed also sought to restore the workability of the policy strategies that had guided system operations in the 1920s. As we will show, during the 1950s the focus of monetary policy targeting moved increasingly away from the behavior of total reserves and the money supply and toward the cost and availability of credit. Thus, despite new appreciation of the relationship between growth rates of the money supply and price level, monetary policy during the 1950s and 1960s was largely consistent in terms of goals and strategies with the Fed’s long-standing behavior. That policy, pursued in a post-1933 environment of weakened political independence, a large outstanding government debt, a relaxed gold constraint, and the new Keynesian ideology, accounts for the inflationary burst that began in the mid-1960s.

1.5 Did the Great Depression Cause the Great Inflation?

We now explore the fundamental causes of the accelerating inflation of the 1960s and 1970s. We place special emphasis on two aspects of the monetary regime: (1) the Fed’s operating strategy, which tended to exacerbate, rather than counteract, movements of the price level, and (2) the absence of effective long-run constraints on monetary policy, which allowed errors in operating strategy to persist.

The Fed’s operating strategy, which used free reserves and nominal short-term interest rates as policy instruments, was *not* significantly altered by the Great Depression. But the tolerance for long-run policy errors as a result of relying on that operating strategy had increased. Most important, the international monetary regime changed substantially both during the 1930s and after World War II.

The gold standard provided a source of discipline on monetary policy, which helped ensure long-run stability of the price level. Monetary policy that was inconsistent with the long-run maintenance of price stability would cause an outflow of gold. If gold outflows were not halted by contractionary policy, ultimately the monetary authority would have to abandon gold convertibility. Under the Bretton Woods dollar standard, inflationary monetary policy that was not consistent with a long-run fixed exchange rate could (and did) continue for decades before finally producing the inevitable collapse.

Expanded power to monetize government debt also contributed toward inflation in the long run. The Glass-Steagall Act of 1932 relaxed a key constraint on money supply growth by permitting the partial backing of Federal Reserve

liabilities with government securities. Although a gold reserve requirement remained, the new authority in effect promoted monetization of government debt. This encouraged increases in government deficits and their monetization, as government officials pressured the Fed to maintain low yields on government securities.

Even after the accord, the Fed continued to place a great deal of emphasis on maintaining “stability” in the market for government securities, which translated in practice into monetizing the deficits of the 1950s and 1960s. We argue that the history of deficits and Fed reactions to them during the 1950s and 1960s is at least consistent with the view that money supply growth, and perhaps the deficits themselves, would have been lower if the Fed had lacked the power to monetize government debt.

Two other byproducts of the Great Depression also helped to remove long-run constraints on inflationary monetary policy. The diminution of the Federal Reserve’s political independence and a concomitant increase in the power of the Treasury contributed to the policy of deficit monetization by giving greater influence to Treasury objectives in Fed policy making. Another outcome of the depression was a new macroeconomic ideology that called for the active use of fiscal and monetary policy to achieve full employment and maximum growth of real output.

Our argument that the institutional and ideological legacy of the Great Depression mattered for the history of postwar inflation presumes an implicit counterfactual argument—that similar changes would not have come about in the absence of the depression. Counterfactual institutional history is treacherous ground, and reasonable people can differ about what the world would have looked like by the 1960s if the depression had not occurred. Nevertheless, we believe that the depression produced unique changes that would not have taken place otherwise.

While one could plausibly argue that the gold standard would have been suspended during World War II (as in previous wars) even in the absence of the depression, that is largely beside the point of our argument. Wars had always produced *temporary* departures from fixed exchange rates, but the end of wars have brought a return to fixed exchange regimes (Calomiris 1991; Bordo and Kydland 1995). The international departure from gold in 1931 and 1933 was unique because it was associated with a growing belief that the gold standard was a pernicious institution that had contributed to the severity of the depression. The depression produced not only a departure from gold but a departure from the classical ideology of gold. The ideology of gold—including the view that long-run price stability warranted the sacrifice of control over short-run macroeconomic fluctuations—had withstood over a century of peacetime recessions and wartime inflations but now crumbled under the unprecedented economic collapse of the 1930s. In its place, the new Keynesian ideology of government intervention to manage business cycles would now reign. Thus, the depression can be credited with producing a *permanent* departure from a hard-money standard that would not have occurred otherwise.

Similarly, it is likely that permanent monetization of deficits would not have been produced by World War II alone. No doubt special temporary laws or other measures would have produced wartime monetization during World War II, as in World War I. But the expansion in the Fed's power to monetize deficits in 1932 was important because it did not originate in war and thus would not disappear with the end of war. It reflected a new view that monetary powers should be broadened *permanently*—a view that reflected the perceived need to strengthen the Fed's hand against deflation.

Finally, it seems unlikely that the diminution of Fed power that was produced by the 1935 restructuring of the Fed would have occurred without the Great Depression. Major restructurings of institutions are typically byproducts of a crisis mentality—the perception that something is drastically wrong. Absent the depression, we doubt it would have been so easy for the Treasury and the president to obtain their new powers over monetary policy.

In the remainder of this section we first document the return to the Fed's traditional operating strategy after the accord. Then we show how the absence of long-run constraints on policy allowed the Fed to stumble into the unintended inflationary surge of the 1960s.

1.5.1 A Return to Traditional Instruments: Interest Rate and Free Reserves Targeting

Following the accord, the Fed placed new emphasis on the growth of bank reserves and money supply as sources of inflation, in both public statements and internal discussion. In formulating an operating strategy in the postaccord era, however, the Fed returned once again to a strategy of using open market operations to affect the level of discount-window borrowing and excess reserves. In the Board of Governors' annual report for 1953, the Fed stated that “during the preceding two years, the Federal Reserve has moved toward greater reliance on influencing the cost, availability, and supply of credit through the discount mechanism, that is by making it necessary for member banks to borrow from the Federal Reserve Banks a portion of the additional reserves required to meet credit growth. This mechanism limits credit expansion, puts pressure on banks, and makes them more responsive to changes in the discount rate” (quoted in Ahearn 1963, 122). And, the April 1953 Federal Reserve *Bulletin* indicated that “open market operations and the discount rate are again being used . . . as twin reserve banking measures. . . . Open market operations can be employed when needed to condition the current tone in credit markets and the general availability of credit. By these operations the Federal Reserve can tighten or ease the pressure on member bank reserve positions and thus cause banks to borrow or enable them to reduce borrowings at the Reserve Banks. Subsequently, this tightness or ease is transmitted and magnified in money and credit markets” (quoted in Ahearn 1963, 123).

These statements are virtually identical to operating guidelines explained by Benjamin Strong and other Fed officials in the 1920s. For example, in testimony in 1926, Strong indicated that “it is a more effective program . . . to

begin to sell our government securities. It lays the foundation for an advance in our discount rate. . . . The purchase of securities eases the money market and permits the reduction of our discount rate" (Strong 1926, 332–33). Moreover, "the influence of the reserve banks upon the volume of credit is . . . felt not directly, but indirectly through the member banks. The reserve banks do not 'push' credit into use" (468).

Winfield Riefler, who was to be the FOMC secretary during the 1950s, explained how the Fed could affect monetary conditions by influencing the volume of discount-window borrowing: "Various monetary factors—such as gold movements, changes in currency demand, and open-market operations by the Reserve Banks . . . determine the volume of indebtedness [of member banks to the Reserve Banks]. . . . And changes in this indebtedness appear to be the initiating force in corresponding changes in money rates" (1930, 27). According to this view, banks are reluctant to borrow from the Reserve Banks, and when forced to borrow, banks will sell securities, call loans, and otherwise reduce credit. Strong argued that "experience in the past has indicated that member banks when indebted to the Federal Reserve Bank of New York . . . constantly endeavor to free themselves from the indebtedness, as a consequence such pressure as arises is in the direction of curtailing loans" (quoted in Chandler 1958, 239). The similarity of these views with those outlined by Fed officials in the 1950s illustrates that at an operational level, monetary policy was little changed between the 1920s and 1950s. As in the 1930s, Federal Reserve officials in the 1950s sought to make operational the tools and strategies the Fed had used in the 1920s. Their goal was to reestablish a regime in which free reserves served as the operating target, with market interest rates and the availability of credit being the intermediate objectives of policy.

At FOMC meetings in early 1952, one topic of discussion was how to define monetary policy "neutrality." The definition of a neutral policy put forward at the meeting of 21 April was a policy "under which System operations endeavor to maintain a situation where there is a moderate amount of borrowing at the Federal Reserve Bank [*sic*]" (FOMC, *Minutes* 21 April 1952, 15–16). New York Fed President Allen Sproul went on to argue that "a borrowing level of \$400 million and a high level of excess reserves was not the same as an equal amount of borrowing with no excess reserves" (16). In other words, the key variable to focus on was not discount-window borrowing, but rather the difference between excess reserves and borrowed reserves, that is, free reserves. As Fed Chairman Martin put it, free reserves "had to be used as an indication, for that was the framework within which the [FOMC] Account Manager had to work" (FOMC, *Minutes* 6 May 1958, 52).

By early 1953, the Fed had become sufficiently concerned about inflation to increase the discount rate for the first time since 1950 and to carry out open market transactions to reduce free reserves. Despite the accord, Fed officials remained sensitive to the administration's desire to keep the rates on government securities relatively low and stable, particularly near issuing dates. Gen-

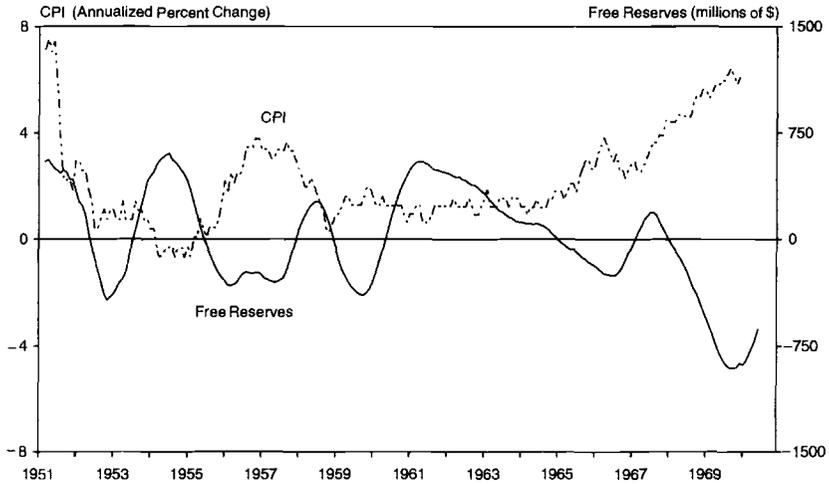


Fig. 1.1 Free reserves and inflation

Source: Board of Governors of the Federal Reserve System.

erally, the Fed sought to avoid substantial fluctuations in T-bill yields as issue dates approached, a policy officials referred to as maintaining an “even keel.” At the 6 January 1953 FOMC Executive Committee meeting, policymakers decided to tighten, however, even though a Treasury issue was forthcoming. Chairman Martin argued for this policy because he saw “danger signs of speculation . . . not least of which was activity in the stock market itself” (FOMC, *Minutes* 6 January 1953, 5–6). How reminiscent this was of policy during 1928 and 1929, and again during 1936 and 1937, when the Fed also manipulated free reserves to quell perceived speculation.

The behavior of free reserves throughout the 1950s and 1960s is consistent with its use by the Fed in response to large movements in prices and real output. For illustration, we plot in figure 1.1 the growth rate of the consumer price index (CPI) and the level of free reserves (both smoothed using a 13-month centered moving average filter) from the accord (March 1951) through 1969. The Fed acted to increase free reserves in 1954 when industrial production declined and the price level held constant. Free reserves were brought down as the economy recovered and inflation rose. Free reserves were increased in 1958 with another cyclical downturn, lowered in 1958 and 1959, and increased during the recession of 1960.

During the 1960s, free reserves generally fell, with two notable exceptions (see fig. 1.1). Those exceptions were the rises between 1966 and 1967 and between 1969 and 1970. The latter reflected the Fed’s response to a distinct slowing of economic activity. The 1966 increase reflected the Fed’s response to a “credit crunch,” which, according to some Fed critics (including President

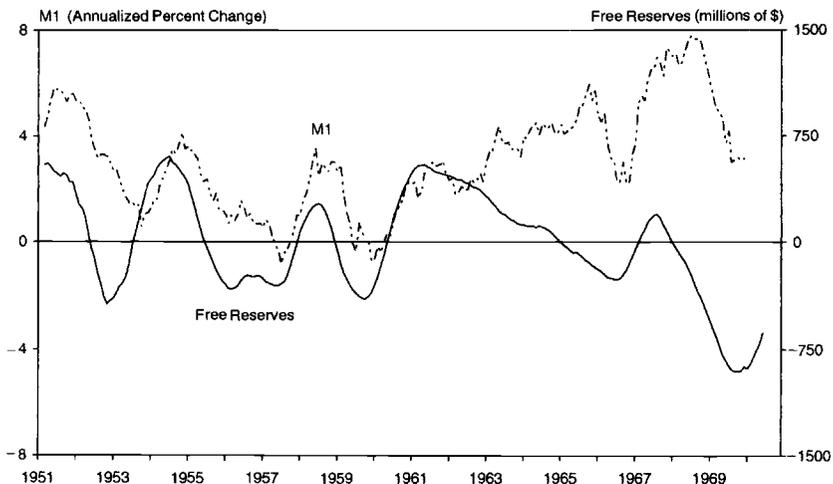


Fig. 1.2 Free reserves and money supply growth

Source: Board of Governors of the Federal Reserve System.

Johnson), had occurred because of an excessively tight monetary policy. More important, however, than these fluctuations were the declining trend of net free reserves and the rising trend of interest rates. These trends created the impression within the Fed that monetary policy was neutral or contractionary—that the Fed was “leaning against the wind”—when in fact policy was quite inflationary.

Academic critics of the Fed, especially monetarists, argued that monetary policy was inflationary because the money supply growth rate generally accelerated over the decade. Figure 1.2 shows that the growth rate of demand deposits and currency held by the public (M1), accelerated during the 1960s even as the level of free reserves declined.¹⁹

By 1965, inflation had risen to 4 percent, and Fed officials considered anew the stance of policy. At the FOMC meeting of 12 October, Chairman Martin expressed considerable worry about inflation but argued against a tighter policy: “With a divided [open market] committee and in the face of strong Administration opposition he did not believe it would be appropriate for him to lend his support to those who favored a change in policy now” (FOMC, *Minutes* 12 October 1965, 69).

By the November FOMC meeting, Martin was even more convinced that “the country was in a period of creeping inflation . . . and the balance of payments situation would be benefited by more restraint in the overall economy. In short, he thought the economy was growing too fast at the moment”

19. Meigs (1962) and Brunner and Meltzer (1964) were among the earliest critics of the free reserves interpretation.

(FOMC, *Minutes* 23 November 1965, 85). On 5 December, the Federal Reserve discount rate was increased from 4 percent to 4.5 percent.

Had the Fed finally moved to stop inflation? Not according to one member of the Board of Governors, Sherman Maisel, who argued the following in May 1966:

When members looked at total reserves or nonborrowed reserves, either of which he took to be the principal measure of the [open market] committee's actions, they must be appalled at the committee's results. . . . In the five months since December 1 [1965], the committee had poured more reserves into the banking system than were furnished in the entire previous year. In fact . . . since December 1, the total increase in reserves had been larger than in any full year since 1951. . . . These results did not accord with either the committee's intent, its statements or sound policy. . . . The committee apparently had followed sub-goals such as feel of the market, net [free] reserves, or the need to offset shocks, and as a result it had moved in a direction opposite to its real policy aim. (FOMC, *Minutes* 10 May 1966, 62–63)

Martin responded to this criticism with the view that “he did not think the committee should be too dissatisfied with monetary policy because of the recent trends in banking aggregates. . . . The Committee should not press too hard in the belief that monetary policy alone could achieve price stability. . . . Perhaps all members of the Committee—and he included himself—tended to think at times that monetary policy could do more than it in fact could.” Interestingly, Martin also expressed the “hope that the System would not find itself in the position of having raised the discount rate after the crest of the cycle had been passed. If it did, it was likely to bear all the blame for subsequent developments.” Martin went on to recall the Fed's moves to tighten policy in 1957, and how the subsequent recession had been blamed on the Fed. Martin then cautioned that “he thought the committee should bear that in mind” (FOMC, *Minutes* 10 May 1966, 94–95).

As Maisel succinctly explained to the FOMC in May 1966, the inflationary surge had been the result of poor targeting rules, not an inflationary intent by the Fed. Fed officials believed they were pursuing appropriate policies to contain inflation and assist in maintaining equilibrium in the balance of payments but had stumbled into inflation because of their attachment to free reserves targeting and misinterpretation of rising interest rates.

Despite the forceful arguments of Maisel and a few other members of the FOMC, the Fed did not reject the use of free reserves as its operating target (or nominal interest rates as a policy guide).²⁰ In our view, the acceleration of

20. The Fed never used a free reserves operating target mechanistically—discretion always was important, and by the late 1950s, doubts about the reliability of free reserves led the Fed to adopt a more eclectic approach to policy. Much as the Fed appears to be groping for policy guides today, in the 1960s Fed policymakers discussed an array of potential candidates, settling on none as paramount. This lack of specificity is reflected in a discussion between a Reserve Bank president and the FOMC account manager in 1959. The president remarked that he “did not know precisely

inflation in the mid-1960s cannot be attributed plausibly to perceived or actual shifts in the Fed's taste for inflation. Clearly, the FOMC did not intend to increase inflation when it permitted the money supply to rise before 1965, or when it stepped once again on the monetary gas peddle in 1967. Declining levels of free reserves during the 1960s reflected Fed efforts to prevent inflation. Similarly, it is important to note that nominal interest rates rose sharply, roughly doubling from 1962 to 1966. The inflationary surge of the mid-1960s thus was not the consequence of a rigid adherence to a nominal interest rate target like that of the World War II era.²¹

How much of the onset of the Great Inflation of the 1960s and 1970s can be attributed to the impact of the Great Depression? As we have shown, the depression was not a watershed in terms of the Fed's fundamental objectives and targeting strategy. Under Benjamin Strong's leadership, by 1924 the Fed was using open market operations and discount rate adjustments to pursue both domestic and international goals. At an operational level, the Fed targeted the borrowed reserve positions of member banks and judged the stance of its policy by the levels of member bank borrowing and market interest rates. Over time, the Fed became more cognizant of the behavior of the supply of money, but throughout the 1950s and 1960s it never rejected free reserve or interest rate targeting in favor of a monetary aggregate operating strategy. Consequently, as in the 1920s and early 1930s, in the 1950s and 1960s monetary policy tended to exacerbate swings in economic activity and the price level, which explains to a great extent how the Fed "stumbled" into an inflationary monetary policy during the early 1960s.

1.5.2 The New International Monetary Regime

The Bretton Woods system represented a substantially new international monetary regime in which excessive U.S. money growth (and concomitant external imbalance) could continue for several years. Had the Fed been subject

what was meant by an even keel policy. Should it be measured by net free reserves, net borrowed reserves, the feel of the market, or the intuition of the Account Manager?" The manager replied that he "thought it was a mixture of the things [the president] had mentioned" (FOMC, *Minutes* 5 May 1959, 45). On another occasion, Chairman Martin argued that when carrying out policy, "reference should be made primarily to the color, tone, and feel of the [government securities] market . . . rather than to a specific level of free reserves" (FOMC, *Minutes* 11 September 1962, 48).

21. We differ with Goodfriend (1991), who argues that the Fed used free reserves to disguise its true policy of controlling interest rates during both the 1920s and in the postaccord era. Free reserves was regarded by Fed officials as their appropriate operating target and also as a useful independent signal of conditions in the money market. Goodfriend is correct, however, that the Fed's policy regime was fundamentally nonmonetarist and permitted money supply growth to exacerbate fluctuations in the growth rate of nominal GDP. Another view, offered by Chari, Christiano, and Eichenbaum (1996), is that the inflationary surge was the product of self-fulfilling expectations of higher inflation by the public in an interest rate targeting regime. This seems implausible, however, because of Caskey's (1985) finding that public perceptions of inflation persistently lagged actual inflation during the 1960s and 1970s. In other words, in the mid-1960s, expected inflation remained consistently lower than actual inflation.

to the discipline of the gold standard as it existed before 1933, inflationary money growth could not have continued for so long, and it would not have been possible for the Fed to stumble into the inflation of the 1960s.

The Bretton Woods system operated as a set of gold-dollar fixed exchange rate standards. The system began in 1946 and came fully into place as a worldwide monetary system in 1959. Under the Bretton Woods system, the United States was the only country that maintained a commitment to convertibility into gold, via the “gold window.” Other countries pegged their currencies to the dollar. Bretton Woods was thus like the interwar gold exchange standard in that most countries held their international reserves in the form of the currency of the country or countries at the core.²² The mechanism for maintaining gold convertibility under Bretton Woods, however, was fundamentally different from that of the interwar gold exchange standard. It was this mechanism that explains how inflation could persist in the United States during a period in which a fixed exchange rate between the dollar and gold was maintained.

Neither the interwar gold exchange standard nor the Bretton Woods system was a pure gold standard—both permitted some discretion. Under Bretton Woods, however, the mechanism by which the balance of payments exerted discipline on central banks was largely removed from private markets and given to central banks themselves. This mechanism reflected a fundamental shift in ideology, from one that saw maintaining gold convertibility as paramount for long-run prosperity to an ideology that viewed fixed exchange rates and gold convertibility as desirable but not so important as to warrant the sacrifice of short-term economic stability in defense of the international system. Discretionary monetary policy—“managed money”—was permitted under Bretton Woods to a degree never before achieved under a gold standard.

Under Bretton Woods, a balance-of-payments deficit (surplus) for the United States would be reflected in a buildup (contraction) of foreign central bank holdings of U.S. dollars, unless the foreign central banks and the United States exchanged dollars for gold. The Bretton Woods system imposed only limited constraints on member countries (including the United States) to pursue monetary and fiscal policies that were consistent with a long-run commitment to a fixed exchange rate. While foreign central banks could have enforced monetary discipline on the United States by converting dollars into gold, in practice they refrained from doing so until 1965, when the French began to convert dollars into gold in the face of large and persisting American balance-of-payments deficits. By that time, a large dollar imbalance had been created by expansionary U.S. monetary policy. The relative world supplies of gold and dollars trended in opposite directions over this period, and clearly a fixed dollar-gold exchange rate was not sustainable under these circumstances. In

22. Redish (1993) argues that Bretton Woods was thus an “extension” of the interwar gold standard, which, in turn, was one step on a long path delinking the world’s currencies from gold (with Bretton Woods being the last). See Bordo and Eichengreen (1993) and Eichengreen (1992) for comprehensive treatments of the evolution of the Bretton Woods system.

the event, the Bretton Woods system collapsed from 1971 to 1973 following closure of the gold window on 15 August 1971.

As we have seen, the Fed's reaction to domestic inflation, persistent U.S. balance-of-payments deficits, and French demands for redemption of dollars caused only a brief interruption in the upward trend in money supply growth in the mid-1960s. Bordo (1993, 57) argues that part of the reason for the Fed's lack of sustained vigor was the widely held belief that the Bretton Woods system could be sustained without monetary discipline. Influential economists argued that monetary expansion could continue, while the balance-of-payments problem could be addressed by other policies (Bordo 1993, 58–59; Yeager 1976, 567–76).

Federal Reserve officials became increasingly concerned about the balance of payments in the late 1950s. But Fed officials were also wary of combating a balance-of-payments deficit with policies that might interfere with other goals. For example, Alfred Hayes, president of the Federal Reserve Bank of New York, argued that “I would think it unwise to let the gold outflow itself affect our monetary policy directly, i.e., in the way of using a tightening move directed specifically toward stemming the flow and unrelated to domestic economic developments” (FOMC, *Minutes* 10 November 1958, 14–15). On another occasion, a Reserve Bank president expressed concern about the balance-of-payments deficit but was reluctant to advocate a tighter policy for fear of disrupting the market for government securities: “Generally, he felt that the course of monetary policy should be moving toward a more restrictive posture. At the same time, he was quite concerned about the rate picture in the government securities market and the problems facing the Treasury in the future” (FOMC, *Minutes* 5 May 1959, 34). This reluctance to face squarely gold outflows and a balance-of-payments deficit stands in marked contrast to the Fed's swift reaction to gold outflows in 1931. At that time, Fed officials agreed that maintaining convertibility of the dollar into gold at a constant price was fundamental to long-run economic stability, and they were willing to tighten monetary policy in the middle of a depression in order to preserve the international monetary regime. By contrast, in the 1950s and 1960s, Fed officials viewed the balance of payments with concern but hesitated to make it the sole, or even the primary, focus of policy. This change in philosophy, attaching less importance to the gold standard rule and more to discretionary policy was an important legacy of the Great Depression.

Although Fed officials were unwilling to tighten sufficiently to arrest the balance-of-payments deficit, they did see the deficit as influencing their ability to promote domestic economic activity. Chairman Martin, for example, argued that “if the Federal Reserve got the reputation of following a cheap money policy just for the sake of doing so, people abroad would be encouraged to think the System was not concerned with the balance of payments or the soundness of the dollar” (FOMC, *Minutes* 13 December 1960, 40). Martin also ar-

gued that “the balance of payments problem . . . was a vital factor in the unemployment situation. Foreign capital was finding the United States less and less attractive, there were pressures for movement of capital abroad, and this was having a deleterious effect on employment in this country” (FOMC, *Minutes* 6 March 1962, 56).

Martin often spoke of the international payments deficit as the most important problem facing the Fed. As often, however, he seems to have found excuses for not taking stronger action. For example, in November 1964 Martin expressed a preference for a tighter policy because of the worsening balance-of-payments deficit and the potential for increased inflation. He was unwilling, however, to advocate a tightening without broad committee support. Martin also pointed out that a new Treasury issue was forthcoming, which generally called for an even keel policy. Reflecting the frustration of pursuing multiple objectives with a single tool, New York Fed President Hayes then complained that “there seemed never to be a right time to make a difficult decision, and that the need for maintaining an even keel during Treasury financings inhibited action by the Committee much of the time” (FOMC, *Minutes* 10 November 1964, 82).

Fed officials also understood that the balance-of-payments deficit stemmed from differences in the macroeconomic policies of different countries. At an FOMC meeting in 1959, a Fed staff member reported that “the net result of attempts in this country to validate our wage and price policies through monetary expansion could succeed only if we could inflate the whole world.” The staff member went on to argue that expansionary monetary and fiscal policy could “price United States’ goods out of world markets” because officials of other countries, notably Germany and the Netherlands, surely would not permit inflation in their domestic prices (FOMC, *Minutes* 5 May 1959, 14). The same official, however, was unwilling to blame monetary policy alone for the balance-of-payments deficit. In arguing that gold outflows “call for a generally restrictive credit policy . . . more effective corrections . . . would be moves to reduce the budgetary deficit and the checking of price rises due to wage and other cost increases” (FOMC, *Minutes* 21 October 1958, 17–18).

The Fed’s unwillingness to tighten sufficiently to stem the balance-of-payments deficit led it to consider other actions it might take. One of the earliest of the policies intended to restore external balance was Operation Twist—an attempt to twist the term structure of interest rates, to keep short-term interest rates high enough to attract foreign capital while keeping long-term interest rates low enough to favor domestic expansion. This unsuccessful policy is now a popular textbook example of government failure to understand the concept of arbitrage in financial markets.

In fact, Fed officials were skeptical about Operation Twist from the beginning. Martin, for example, believed that “when an attempt was made to determine the short rate against the long rate except for a very short period of time,

the System would be in trouble” (FOMC, *Minutes* 22 November 1960, 42). Nevertheless, Martin believed that the tactic was worth trying (see FOMC, *Minutes* 20 August 1963, 58).

Another Fed initiative to combat the balance-of-payments deficit and the weak dollar was direct intervention in foreign exchange markets. The Gold Reserve Act of 1934, which established the Treasury’s Exchange Stabilization Fund, had been interpreted by counsel to the Board of Governors as precluding Federal Reserve intervention in foreign exchange markets, except as agent for the Treasury. In 1961, the Fed reconsidered the efficacy of intervention and whether it had the legal standing to intervene on its own. This time, the board’s counsel argued that the Fed did have the right to intervene. Concern on the part of individual FOMC members, however, led the Fed to seek the advice of the Treasury and the banking committees of Congress. The treasury secretary wrote to the FOMC that “it is surely a proper central banking function to engage in temporary operations that will help to buffer and moderate tendencies toward volatile flows of funds” (FOMC, *Minutes* 19 December 1961, 85–86). With that endorsement, the FOMC began its independent intervention in foreign exchange markets.

Other policies intended to correct international payments imbalances without slowing domestic activity included new agreements with foreign central banks to forebear from demanding gold, the issuance of foreign-currency-denominated U.S. bonds (“Roosa bonds”), requests of early repayment by foreign governments of debts to the U.S. government, the removal of interest rate ceilings on U.S. bank time deposits, capital outflow constraints imposed in the United States, and changes in U.S. tax treatment of foreign earnings. Balance-of-payments deficits continued, however, and the long-term feasibility of the existing dollar-gold standard increasingly became a mathematical improbability.

Such delay could not have happened under the classical gold standard. That system imposed strict limits on the ability of central banks to ignore external imbalance in the interest of internal growth. It is true that limited and temporary sterilization of gold outflows was possible under the classical gold standard, and there is some evidence that central banks resisted the so-called rules of the game (by which is meant a policy of reinforcing rather than sterilizing the effects of short-run gold flows on money). Nevertheless, a sustained outflow of reserves over the years was not feasible under the discipline of the gold standard. Under Bretton Woods, by contrast, the absence of market-determined gold flows deprived the Fed of an early warning sign of unsustainable money policy and enabled greater monetary policy discretion.

1.5.3 Stabilization of Government Security Prices

Although important, the Fed’s flawed policy framework and the absence of gold standard discipline cannot account entirely for the monetary policy outcomes of the 1960s and 1970s, especially for the Fed’s unwillingness to quell

inflation once it had clearly begun. Another contributor to these outcomes, which did represent a break with predepression policy, was the Fed's policy of stabilizing the prices of government securities. This policy was begun in the mid-1930s, became the sole objective of policy during World War II, and continued even after the 1951 accord. The effect of this policy in the 1960s was the partial monetization of that decade's growing fiscal deficits.

The Federal Reserve System was established with two guiding principles—the gold standard and a theory of banking that later became known as the real bills doctrine. Although Federal Reserve Banks were permitted to buy U.S. government securities, the extension of Federal Reserve credit was limited by their holdings of gold and short-term commercial securities acquired mainly by making discount-window loans.²³ Hence, the Federal Reserve Act implicitly limited the extent to which federal debt could be monetized. The Fed first departed from real bills principles during World War I, when it encouraged banks to buy government securities by offering to lend them reserves against their security holdings at a rate that guaranteed the banks a profit. During the war, however, the Fed always held sufficient gold to back its liabilities. Another apparent departure from real bills principles came when the Fed made open market purchases of government securities in the 1920s, but again, the Fed's gold and commercial paper reserves were never jeopardized.

The Glass-Steagall Act of 1932, however, constituted a fundamental departure from the principles underlying the Federal Reserve Act by expanding the permissible assets backing Fed liabilities to include government securities. That legislation, and its permanent replacement in 1933, substantially weakened the checks on Federal Reserve monetization of government debt. As we have seen, the Fed came under considerable pressure to maintain low yields on government securities in the mid-1930s, and this policy became paramount during World War II.

Whether or not the Fed's policy of maintaining ceiling yields on federal government debt during World War II was justifiable, the Fed's continuing commitment to stabilization of government securities prices after the 1951 accord is puzzling. While the Fed had agreed as part of its accord with the Treasury to "maintain an orderly market" for government securities (Krooss 1969, 3056), such a vague commitment had no real force. Furthermore, in contrast to the 1930s, the Fed was sufficiently large by the 1950s to easily offset any interventions by the Treasury, thus removing any credible threat by the Treasury to force the Fed's hand.

23. The Federal Reserve was founded in part to provide a mechanism for increasing and decreasing the supply of bank reserves and currency in response to fluctuations in the needs of banks for accommodating the demands of their customers for loans and currency. The real bills doctrine holds that when banks restrict their lending to short-term commercial notes, the supply of credit will be sufficient but not inflationary. Thus, the extension of Federal Reserve credit on the basis of the rediscount of commercial paper will ensure the noninflationary accommodation of credit demand associated with real economic activity. See Wheelock (1991) and the references therein for additional detail about the founding principles of the Fed.

What then accounts for the Fed's continuing commitment to support government securities prices in the postaccord period? Part of the answer lies in the magnitude of Treasury borrowings in the early 1950s, which coincided with the Korean War. The burden of the war grew in the years immediately following the accord. While national security expenditures accounted for only 33 percent of the federal budget in 1950, they reached 67 percent in 1952 (Blum et al. 1973, 726). It would have been tantamount to "unpatriotic" for the FOMC to have completely neglected the government's financing needs at this time of fiscal strain. President Truman made clear to FOMC members his view of their responsibilities in a meeting with them on 31 January 1951: "The President emphasized that we must combat Communist influence on many fronts. He said one way to do this is to maintain confidence in the government's credit and in government securities" (FOMC, *Minutes* 31 January 1951, 24). As during World War II, Fed officials undoubtedly believed that the national interest would be served by easing the government's debt management problems during the Korean conflict.

Perhaps similar thinking about the role of monetary policy during armed conflicts partly explains the Fed's bond price stabilization policy during the Vietnam War. Some evidence of this is revealed by meetings between Fed and Treasury officials about securities markets in conjunction with the war's escalation. For example, in describing a 1965 meeting between Fed officials and Paul Volcker, then deputy undersecretary of the treasury for monetary affairs, the Fed's account manager reported that the Fed had not been asked to peg the prices of government securities but nevertheless to lend general market "support" (FOMC, *Minutes* 10 October 1965, 26).

The view that Korea and Vietnam contributed to deficit monetization, however, does not imply that monetization was an unavoidable outcome of those wars. The scale of the wars was probably not great enough to have produced special wartime monetary powers (deficit monetization or the suspension of the gold standard). If those powers had not been in place prior to the wars (as a consequence of depression-era changes), monetization of government debt might have been largely avoided.

Furthermore, in the absence of an automatic mechanism for monetizing deficits, the Johnson administration likely would have felt more pressure to choose between war expenditures and Great Society programs. It is possible that both the Korean and Vietnam eras would have seen shrinkage in non-war-related federal expenditures if the post-World War II regime had been characterized by a return to the gold standard and the absence of Fed authority to monetize deficits.

The desire to placate the Treasury by maintaining low and stable yields on government securities, especially during wartime, was only one reason the Fed continued to attempt to manipulate government securities prices. A second reason, revealed in the minutes of FOMC meetings during the 1950s and 1960s, was that Fed officials viewed the market for government securities as inher-

ently inefficient or unstable. Not only was the policy of even keel near dates of new Treasury issues accepted virtually without question, but Fed intervention seems to have been widely viewed as necessary to preserve stability in the market. Later, a similar view was taken toward the foreign exchange market. While no direct reference is made in the minutes to the experience of the depression, we wonder whether the view that financial markets were inherently unstable and market prices were in need of “management” was itself in part a reaction to the depression.²⁴

1.5.4 A Diminution of Federal Reserve Independence and a New Economic Ideology

Although some New Deal legislation expanded the scope of Federal Reserve powers, other legislation served to lessen the Fed’s independence. We have argued that diminished political independence contributed to the refocus of monetary policy toward the stability of the government securities market in the 1930s. Although the accord restored a measure of independence to the Fed, the Fed remained under pressure to keep market yields on government securities low and to attempt to engineer higher output and employment in the near term, even at the expense of higher inflation down the road (e.g., see De Long 1995). A monetary policy framework that interpreted rising nominal interest rates as evidence of tighter monetary policy, coupled with pressure to fund federal government borrowing at the lowest possible cost, caused monetization of government debt. Over time, this produced higher inflation.

24. The use of monetary policy to stabilize the market for government debt represented one sharp departure from the Fed’s founding principles and the policies it pursued before 1933. A second departure, also first appearing with the Glass-Steagall Act of 1932, involved collateral requirements for discount-window loans and, later, the uses of Federal Reserve credit. In line with real bills principles, the Federal Reserve Act restricted the collateral for discount-window loans to high-quality, short-term commercial loans. In relaxing the collateral provisions, first in 1932, and then by subsequent legislation during 1933–35, Congress accepted the argument that many banks with sound assets had been denied access to the discount window because they had lacked eligible collateral and that this had worsened the banking collapse and depression. In addition, it was widely believed that inadequate access to credit had forced the bankruptcy of many firms, and so the Fed was authorized to lend directly to individuals, partnerships, and corporations and to make industrial advances of up to five years. Although these lending provisions have never resulted in large extensions of Federal Reserve credit, they represented a fundamental break with the principles underlying the Federal Reserve Act as it was originally conceived.

The expanded scope for Federal Reserve lending reflects a view that legal restrictions had limited the Fed’s ability to protect the banking system from collapse during 1929–33. In essence, the Fed had failed to act as lender of last resort, and relaxed discount-window borrowing rules were one attempt to ensure that the Fed would not fail again in its responsibilities for lack of legal authority. In recent years, the Fed has shown considerable willingness to act in the name of preserving financial stability. Examples include its guarantees of liquidity to banks to preserve stability of the commercial paper market in the wake of Penn Central’s default in 1970, and of financial markets in general following the stock market collapse of 1987. Whether or not such interventions constitute appropriate lender-of-last-resort behavior or are otherwise socially justifiable (for opposing views, see Schwartz 1992; Calomiris 1994), the Fed seems unlikely to allow a collapse of the financial system on the scale of the Great Depression without exerting considerable effort to prevent it.

By reducing the role of Federal Reserve Bank presidents in favor of the Board of Governors, the Banking Act of 1935 may have contributed to the system's willingness to stabilize the yields of government securities and certainly subjected the Fed to greater political pressures. Did this make the Fed more willing to attempt fine-tuning operations or to accept higher inflation over the long term in exchange for faster real growth and higher employment in the near term? Or was that policy choice more the product of Keynesian ideology, which prescribed interest rate manipulation to promote growth and employment objectives?

Others have written extensively on the new economic ideology born of the Great Depression and associated with Keynes, which increasingly dominated policy discussions, both within and outside the Federal Reserve during the 1960s (e.g., De Long 1995). This macroeconomic paradigm held that monetary policy could increase output and employment without producing inflation so long as resources were not fully employed. Some proponents acknowledged that expansionary monetary policy might increase the rate of inflation but argued that modest inflation was an acceptable cost of faster growth and higher employment. For example, Fed governor Maisel argued that "there is a trade-off between idle men and a more stable value for the dollar. A conscious decision must be made as to how much unemployment and loss of output must be made in order to get smaller price rises" (Maisel 1973, 14).

Another cornerstone of the Keynesian ideology was that inflation was not always the product of monetary policy. As Maisel puts it, "Some price increases originate on the cost side or in particular industries. These cannot be halted by monetary policy" (1973, 14). Accelerating inflation in the late 1960s and early 1970s, he argues, was caused by "government deficits; . . . speculative investment in plant, equipment, and labor by business corporations; . . . use of economic power to raise wages and profits. . . . But most significant were the government deficits" (Maisel 1973, 12). Although not all economists or policymakers held these views, enough did to influence monetary policy. Even today, high-ranking officials of the Federal Reserve System contend that monetary policy can and should be used to maintain full employment (e.g., Blinder 1996).

The Great Depression clearly influenced mainstream economic thought in the 1960s, especially among key economic policy advisors. Lucas writes that one of the "the main features of the Keynesian Revolution and the neoclassical synthesis into which it evolved in the United States . . . [was] the onset of the Great Depression and the consequent shift of attention from explaining a recurrent pattern of ups and downs to explaining an economy apparently stuck in an interminable down" (1980, 704). Even though much of today's mainstream theory rejects many Keynesian ideas, according to Lucas, the Great Depression continues "to defy explanation by existing [new] economic analysis" (1980, 706). For macroeconomics, and to some extent for macroeconomic policymakers, the Great Depression was a watershed.

1.5.5 The Final Depression Legacy: Disinflation in the 1980s and Price Targeting in the 1990s

We have argued that various legacies of the Great Depression were important in allowing the Fed's traditional (and flawed) operating strategy to produce the inflationary surge of the 1960s and 1970s. These include the permanent collapse of the gold standard, debt monetization powers, the decline in Fed independence, and a new macroeconomic ideology that regarded financial markets as unstable and government intervention as desirable. We would emphasize that these various legacies were not equally important in explaining the origins of inflation or its persistence. With respect to the origins of inflation, the collapse of the gold standard was central. By itself, a change in macroeconomic thought could not have changed monetary policy fundamentally, nor could reduced Federal Reserve independence or even the opening of an explicit avenue of debt monetization. The *necessary* condition that made these other influences important was the replacement of the interwar gold standard with the Bretton Woods system, which allowed price-level drift that otherwise would have been impossible.²⁵

While the collapse of the gold standard was essential in the origins of inflation, other legacies of the depression were probably more important for explaining the persistence of inflationary policy in the late 1960s and 1970s. That postponement of disinflation until the 1980s imposed large costs on the economy. As Goodfriend (1993) emphasizes in his discussion of the disinflation of the early 1980s, the costs of avoiding inflation are much lower than the costs of disinflating when the central bank's commitment to end inflation lacks credibility. As Caskey (1985) has shown, inflationary expectations during the late 1960s and early 1970s were consistently below actual inflation. Caskey explains that fact in the context of a Bayesian model of inflation expectations. He argues that the public was slow to grasp the change toward inflation bias in monetary policy. He finds that the public's view of the Fed's reaction function significantly lagged the actual changes because learning about central bank intentions takes time. From that perspective, the Fed probably could have reduced inflation in the 1960s at little cost, relative to the costs borne from 1980 to 1982.

The inflation of the 1960s and 1970s, and the economic costs of disinflation in the 1980s, have undermined some of the legacies of the depression. In this sense, the consequences of the institutional legacies of the depression have weakened the long-run (future) importance of the institutional and ideological

25. Unlike Bordo and Eichengreen (chap. 12 in this volume) we do not believe that, in the absence of the depression and the Bretton Woods system, the gold standard would necessarily have collapsed permanently during the postwar period as the result of gold scarcity. Many other counterfactual outcomes seem as plausible to us—including the adoption of bimetallic or symmetrical standards, or other methods for reestablishing a balance between the real reserves of nations adhering to a hard-currency standard and the real supply of reserves.

changes wrought in the 1930s. Clearly, the new emphasis on price stability as a central *short-run* concern for monetary policy in the 1990s is something of a throwback to the predepression gold standard. One also sees a rebirth of “long-run” thinking in macroeconomics, including a new emphasis on the need for credibility in long-run control of deficits and in deficit monetization. Even the “cleansing benefits of recessions” is enjoying a rebirth in macroeconomics. Thus, looking forward to the twenty-first century, it may be that the influence of the depression—especially the potential inflation bias produced by depression-era policies—may lie more in the past than in the future.

On the other hand, despite the current vigor of the anti-inflation hawks and the decline in the ideological legacy of the Great Depression, it is possible to argue that the most important legacy of the depression remains intact—the destruction of international monetary linkages has not been undone or replaced with new constraints on discretionary policy.²⁶ The lack of an institutional check on discretionary money supply growth suggests that inflation bias may again be latent, waiting to reemerge to finance the widely predicted explosion of government deficits in the twenty-first century.

1.6 Conclusion

The Great Depression brought little change in Fed thinking about the appropriate goals, targets, and instruments of domestic monetary policy. At least as late as the 1960s, Fed behavior was much like that of the 1920s. The free reserves operating framework, which included the use of nominal interest rates as a policy guide, contributed both to the economic collapse of the depression and to the inflation of the 1960s and 1970s. In this sense, the Great Depression did not change monetary policy.

The Great Depression did result in important institutional and ideological changes, however, and these changes made possible the sustained inflation of the 1960s. The fundamental change was the abandonment of the interwar gold standard and its subsequent replacement by the Bretton Woods dollar system. The Fed had carried out a discretionary monetary policy during the 1920s and early 1930s under the interwar gold exchange standard. Gold, however, remained an important barrier to discretion—a barrier that Fed officials were unwilling to breach, even as the economy collapsed in 1931. A new political regime was required, first to devalue, and ultimately to replace the interwar gold standard with the Bretton Woods system.

Under Bretton Woods, monetization of government debts and Keynesian policy experiments could take place without the swift disciplinary response of

26. In contrast to the United States, some countries have adopted new institutional restraints on discretionary policy, such as legislated mandates on central banks to limit price-level fluctuations. The European Monetary Union, with its common currency, can also be viewed as a fundamental institutional change designed to prevent discretionary monetary policy at the level of the individual country.

gold outflows. Once inflation appeared, policymakers lacked the willingness to disinflate. This unwillingness stemmed in part from the Fed's reduced independence, the continuing role of money supply growth as an instrument of government debt management, and new economic views about the causes of inflation and the appropriate role of monetary policy in the economy. Given the persisting fiscal deficits of the postwar era and the new institutional environment, born of the Great Depression, Bretton Woods was doomed and a great inflation was almost inevitable.

One legacy of the Great Depression—the dominance of Keynesian macroeconomic theory among professional economists—has now faded. Although some policymakers remain enamored with the possibility of using monetary policy to increase economic growth, such views no longer have the professional respectability that they had during the 1960s. Moreover, the high inflation of the 1970s made both policymakers and their economic advisors wary of policies that might ignite another inflationary spiral. Still, the permanent absence of a “nominal anchor” for the dollar provides an enduring legacy of uncertainty about the long-run path of monetary policy in the twenty-first century.

References

- Ahearn, Daniel S. 1963. *Federal Reserve policy reappraised, 1951–1959*. New York: Columbia University Press.
- Anderson, Gary M., William F. Shughart, and Robert D. Tollison. 1988. A public choice theory of the Great Contraction. *Public Choice* 59 (October): 3–23.
- Blinder, Alan S. 1996. On the conceptual basis of monetary policy. Remarks at the Senior Executives Conference of the Mortgage Bankers Association, New York, 10 January.
- Blum, John M. 1959. *From the Morgenthau diaries: Years of crisis, 1928–1938*. Boston: Houghton Mifflin.
- Blum, John M., Edmund S. Morgan, Willie Lee Rose, Arthur M. Schlesinger, Jr., Kenneth M. Stamp, and C. Vann Woodward. 1973. *The national experience: A history of the United States*, 3d ed. New York: Harcourt Brace Jovanovich.
- Board of Governors of the Federal Reserve System. Various years. *Annual report of the Board of Governors*. Washington, D.C.: Board of Governors of the Federal Reserve System.
- . 1943. *Banking and monetary statistics, 1914–41*. Washington, D.C.: Board of Governors of the Federal Reserve System.
- Bordo, Michael D. 1993. The Bretton Woods international monetary system: A historical overview. In *A retrospective on the Bretton Woods system: Lessons for international monetary reform*, ed. Michael D. Bordo and Barry Eichengreen, 3–98. Chicago: University of Chicago Press.
- Bordo, Michael D., and Barry Eichengreen, eds. 1993. *A retrospective on the Bretton Woods system: Lessons for international monetary reform*. Chicago: University of Chicago Press.

- Bordo, Michael D., and Finn E. Kydland. 1995. The gold standard as a rule: An essay in exploration. *Explorations in Economic History* 32 (October): 423–64.
- Brunner, Karl, and Allan H. Meltzer. 1964. *The Federal Reserve's attachment to the free reserves concept*. Staff Analysis, House Committee on Banking and Currency, 88th Cong., 2d sess.
- . 1968. What did we learn from the monetary experience of the United States in the Great Depression? *Canadian Journal of Economics* 1 (May): 334–48.
- Calomiris, Charles W. 1991. The motives of debt-management policy, 1790–1880. *Research in Economic History* 13: 67–105.
- . 1994. Is the discount window necessary? A Penn Central perspective. *Federal Reserve Bank of St. Louis Review* 76 (May/June): 31–55.
- Calomiris, Charles W., and David C. Wheelock. 1996. The neutrality of reserve requirement changes in the 1930s. New York: Columbia University. Manuscript.
- Calomiris, Charles W., and Berry Wilson. 1996. Bank capital and risk management: The 1930s scramble to shed risk. New York: Columbia University. Manuscript.
- Caskey, John. 1985. Modeling the formation of price expectations: A Bayesian approach. *American Economic Review* 75 (September): 768–76.
- Chandler, Lester V. 1958. *Benjamin Strong: Central banker*. Washington, D.C.: Brookings Institution.
- . 1971. *American monetary policy, 1928–1941*. New York: Harper and Row.
- Chari, V. V., Lawrence J. Christiano, and Martin Eichenbaum. 1996. Expectation traps and discretion. NBER Working Paper no. 5541. Cambridge, Mass.: National Bureau of Economic Research.
- Currie, Lauchlin B. 1980. Causes of the recession. *History of Political Economy* 12 (Fall): 316–35.
- De Long, J. Bradford. 1995. America's only peacetime inflation: The 1970s. Berkeley: University of California. Manuscript.
- Eccles, Marriner S. 1966. *Beckoning frontiers*. New York: Knopf.
- Eichengreen, Barry. 1992. *Golden fetters: The gold standard and the Great Depression, 1919–1939*. New York: Oxford University Press.
- Eichengreen, Barry, and Peter M. Garber. 1991. Before the accord: U.S. monetary-financial policy, 1945–51. In *Financial markets and financial crises*, ed. R. Glenn Hubbard. Chicago: University of Chicago Press.
- Epstein, Gerald, and Thomas Ferguson. 1984. Monetary policy, loan liquidation, and industrial conflict: The Federal Reserve and the open market operations of 1932. *Journal of Economic History* 44 (December): 957–83.
- Federal Open Market Committee (FOMC). Various issues. *Minutes of the Federal Open Market Committee*. Washington, D.C.: Federal Reserve System, Federal Open Market Committee. Internal document.
- Fisher, Irving. 1935. Testimony before the House Banking and Currency Committee. *Banking Act of 1935*. 74th Cong., 1st sess.
- Friedman, Milton, and Anna J. Schwartz. 1963. *A monetary history of the United States, 1867–1960*. Princeton, N.J.: Princeton University Press.
- Frost, Peter A. 1971. Banks' demand for excess reserves. *Journal of Political Economy* 79 (July/August): 805–25.
- Goodfriend, Marvin. 1991. Interest rates and the conduct of monetary policy. *Carnegie-Rochester Conference Series on Public Policy* 34 (spring): 7–30.
- . 1993. Interest rate policy and the inflation scare problem: 1974–1992. *Federal Reserve Bank of Richmond Economic Quarterly* 79 (Winter): 1–24.
- Johnson, G. Griffith. 1939. *The Treasury and monetary policy, 1933–1938*. Cambridge, Mass.: Harvard University Press.
- Krooss, Herman E., ed. 1969. *A documentary history of banking and currency in the United States*, vol. 4. New York: McGraw-Hill.

- Lucas, Robert E. 1980. Methods and problems in business cycle theory. *Journal of Money, Credit, and Banking* 12 (November, pt. 2): 696–715.
- Maisel, Sherman J. 1973. *Managing the dollar*. New York: Norton.
- Meigs, A. James. 1962. *Free reserves and the money supply*. Chicago: University of Chicago Press.
- Meltzer, Allan H. 1994. Why did monetary policy fail in the thirties? Pittsburgh: Carnegie-Mellon University. Manuscript.
- Miller, Adolph. 1931. Testimony before the Senate Banking and Currency Committee. *Operation of the national and Federal Reserve banking systems*. 71st Cong., 3d sess.
- Redish, Angela. 1993. Anchors away: The transition from commodity to fiat money in Western economies. *Canadian Journal of Economics* 26 (November): 777–95.
- Riefler, Winfield W. 1930. *Money rates and money markets in the United States*. New York: McGraw-Hill.
- Schwartz, Anna J. 1992. The misuse of the Fed's discount window. *Federal Reserve Bank of St. Louis Review* 74 (September/October): 58–69.
- . 1997. From obscurity to notoriety: A biography of the Exchange Stabilization Fund. *Journal of Money, Credit, and Banking* 27 (May): 135–53.
- Snyder, John W. 1969. Annual Treasury report on the events leading to the accord of 1951 and on the Treasury's monetary powers, 1951. In *Documentary history of banking and currency in the United States*, vol. 4, ed. Herman E. Krooss, 3026–71. New York: McGraw-Hill.
- Strong, Benjamin. 1926. Testimony before the House Banking and Currency Committee. *Stabilization*. 69th Cong., 1st sess.
- U.S. Senate. 1931. *Operation of the national and Federal Reserve banking systems*. 71st Cong., 3d sess.
- Wheelock, David C. 1991. *The strategy and consistency of Federal Reserve monetary policy, 1924–1933*. Cambridge: Cambridge University Press.
- Wicker, Elmus. 1966. *Federal Reserve monetary policy, 1917–1933*. New York: Random House.
- Yeager, Leland B. 1976. *International monetary relations: Theory, history and policy*, 2d ed. New York: Harper and Row.

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