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THE FEDERAL RESERVE BANK OF RICHMOND
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This paper will constitute one chapter in the forthcoming *Oxford Dictionary of American Economic History*

“Money, Banking, and Monetary Policy from the Formation of the Federal Reserve until Today”

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Abstract

The United States Congress created the Federal Reserve System in 1913. The System consists of the Federal Reserve Board in Washington, D. C.; 12 Federal Reserve Banks; and thousands of member commercial banks. This entry describes the evolution of the System and of monetary policy from its foundation through 2013.

Keywords: Federal Reserve, Financial Crises, Great Depression, Great Inflation, Fed-Treasury Accord, Banking, Great Moderation, Great Recession.

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1. Founding of the Federal Reserve

Our nation's founding fathers debated whether the United States should have a national bank. In 1791, Congress chartered the first Bank of the United States to handle the financial needs of the federal government and the credit and coinage of the nation. The charter expired after 20 years. Five years later, in 1816, Congress chartered a second Bank of the United States, whose charter also expired after two decades. When its charter expired, Congress failed to override President Jackson's veto of its rechartering. Congress could not agree on a successor because of disagreement about the government's role in money, banking, and financial regulation and about the states-rights issue of the desirability of a bank with nationwide powers (Jaremski and Rousseau, forthcoming; Timberlake 1993).

The Fed was founded in response to periodic banking crises and the recurrent financial instability that plagued the United States in the 19th century (Sprague 1910; Wicker 2000). The precipitating crisis emerged in 1907 with a severe financial panic that spread from the money-center of Manhattan throughout the nation. Congress took the first step toward reform in 1908 when it passed the Aldrich-Vreeland Act, which created the National Monetary Commission. The commission studied the monetary and banking systems of leading countries in Europe. Its final report focused on flaws in the dual-banking system with its federal and state chartering of banks. The letter transmitting the final report to Congress summarized 17 "principal defects in our banking system" (National Monetary Commission 1912, 6).

Thirteen of the 17 related to the fragility of the financial system. The first defect was the immobility of cash reserves in times of trouble. The fifth was the lack of an organization larger than a city clearing house that could coordinate actions "to prevent panics or avert calamitous disturbances affecting the country at large." The sixth was the lack of a lender of last resort, particularly one that could cover the entire country or shift reserves from one place to another to prevent "disastrous disruptions" of the payments system. The seventh was the lack of a lender of last resort that could deal effectively with international gold and currency flows during financial crises. The eighth through 12th pointed to the illiquidity of financial assets, particularly short-term commercial paper, in times of crisis and even during periods of normal seasonal flows. Most of these points related to risks posed by financial panics when in the absence of a lender of last resort commercial banks could not access reserves, sell assets, cooperate effectively, or counteract interregional and international flows.

Some of those institutional defects also prevented banks from meeting normal or unusual seasonal demands for cash and credit. This problem was the focus of the Commission's third and fourth points (as well as points eight through 14). They described the inelasticity of the money supply, whose supply did not respond to seasonal expansions and contractions of the economy. The inelasticity of the money supply stemmed in part from constraints on national bank-note issuance, which was capped as a fraction of national-bank capital. Moreover, the issuance of national bank notes was limited by the need for backing by a special series of U.S. government bonds.

The Commission highlighted another defect in the U.S. banking system. The payments system was fragmented and inefficient. The nation lacked efficient means of routing payments – particularly checks – from one region to another and for accommodating large, seasonal flows of funds between regions. Clearing checks could be slow and expensive. Many institutions charged fees for checks sent through the clearing system. These exchange charges provided substantial streams of revenue for many banks, particularly those operating in small towns and rural areas

(Gilbert 1998).

The Federal Reserve System was created in 1913 in order to solve the problems identified by the National Monetary Commission. The Federal Reserve would operate a universal and efficient payments system and promote a market for banks' short-term loans (banker's acceptances). Through discount window lending, it would create an elastic currency that would expand money and credit at seasonal peaks and more generally in response to the needs of business. The designers hoped to create a system that encompassed all commercial banks in the nation, but bowed to political realities, and continued the compromise between advocates of local and national regulation. (Table 1 provides a list of legislation affecting the Federal Reserve.)

The Federal Reserve System consisted of 12 Reserve Districts, each centered on a Reserve Bank, which acted as a reserve depository and regulator of credit conditions for its district. The Federal Reserve Board, located in Washington D. C., coordinated but did not control the activities of district-level reserve banks. Each Reserve Bank possessed authority to conduct discount window lending at its own discretion. Each one could purchase (or loan money on the security of) real bills, which were short-term commercial paper arising out of commercial transactions (Richardson and Troost 2009; Carlson, Mitchener, and Richardson 2011). At the time, Federal Reserve banks did not deal in overnight loans among private banks (federal funds) or U. S. government securities, which are the principal instruments used to implement monetary policy today. Arrangements to coordinate the activities of the regional Reserve Banks, for example, with respect to open market operations, developed only slowly over time.

The Federal Reserve Act required all nationally chartered banks to join the system, putting them under the authority of both the Federal Reserve and the Office of the Comptroller of the Currency. State-chartered banks and trust companies could also join but they had to subject themselves to Federal Reserve regulations such as minimum capital requirements and clearing checks at par, which many banks thought burdensome (Calomiris, Jaremski, Park, and Richardson 2015; White 1983). Motivated by a desire for less onerous reserve requirements and less stringent regulation, less than a third of state-chartered banks joined the Federal Reserve System. Most of the smaller banks remained non-members under the jurisdiction of state governments, which continued to be the principal regulators of financial activity, not only of commercial banks but also of insurance companies, trust companies, mutual savings banks, credit unions, mortgage originators, and building and loan associations (Komai and Richardson 2014). Eight states (Oklahoma, Texas, Kansas, Nebraska, South Dakota, Mississippi, North Dakota, and Washington) even experimented with state-run deposit insurance programs (Chung and Richardson 2006).¹

2. Real Bills as the Quicksand Foundation of Monetary Policy

Just as important as the creation of an elastic currency as a way of responding to bank panics was the belief that inelastic currency characteristic of the prior National Banking era produced an

¹ Standard references for the following history are found in Meltzer (2003, 2009) and Friedman and Schwartz (1963). See also Hetzel (2008, 2012), Myers (1970), Sumner (2015), and entries in the Federal Reserve System History Gateway <http://www.federalreservehistory.org/> .

excess of credit at times of low demand for credit and that excess spilled over into the speculative extension of credit. That speculation created asset bubbles, the inevitable collapse of which produced financial panic, recession, and deflation. The real-bills doctrine summarized these views. If the regional Reserve Banks made discount window loans based on real bills, which were debt instruments used to finance trade and the production of goods, credit would contract when it was not needed. Proportioning the extension of credit to productive uses in order to prevent speculative excess and decentralizing the location of reserves in order to prevent Wall Street from accessing them for speculation were two pillars intended to prevent financial panic and the resulting economic disorder (Hetzel 2015).

The doctrine of real bills encapsulated the fallacy on which the Federal Reserve as originally conceived rested. Its founders relied on the market to regulate the supply of money and credit subject to a discipline imposed by discount window lending that the extension of credit be for productive not speculative uses. They understood their need to limit the supply of money and credit only in terms of the allocation of credit to productive uses. The responsibility of the Fed was to prevent “inflation,” taken to mean an unsustainable increase in asset prices or asset bubbles.

The founders of the Fed understood nothing of the theoretical constructs of modern monetary theory. They lacked the concept of the price level as distinct from relative prices (nominal versus real) and any concept of the relationship between the price level and money creation. The purposeful control of money creation, referred to as “managed money,” carried the undesirable connotation of Greenbackism, the paper money created by the North in order to finance the Civil War. Through a breakdown in the international gold standard, World War I eliminated the nominal anchor (determinacy of the price level) provided by convertibility of paper money into gold. Fed policymakers did not understand their new responsibilities under the fiat money regime that replaced the international gold standard.

A. World War I and the 1920s

During World War I, the Fed remained legally on the gold standard. However, without the constraint of gold outflows reducing the monetary base (bank reserves and currency), monetary policy became subservient to wartime finance of government expenditures. Money creation was driven by maintenance of a discount rate that enabled banks to buy government debt at a fixed, low interest rate. Inflation followed. Policymakers believed that it originated in speculative excess in commodity markets. In 1919, when the Treasury again allowed the Fed regional Banks to control their discount rates, they responded by raising them. Monetary contraction and a sharp recession ensued. However, the recession was short-lived.

The Federal Reserve earned acclaim for America’s economic performance during the ensuing Roaring Twenties. By the mid-1920s, bankers, businessmen, and politicians concurred that the Federal Reserve had accomplished the goals set forth at its founding. Apart from the 1920-21 recession, economic growth had been rapid, interest rates had been stable, and financial crises had been contained. Since the founding of the Fed, recessions had been short and recoveries rapid. Gold reserves had risen. The Federal Reserve note (what we now call the dollar, but which in 1914 was one of many different dollars) had become one of the world’s leading currencies. The world economy, in contrast to the economy in the United States, had experienced a decade of doldrums following the First World War.

The Federal Reserve's apparent success led to the McFadden Act, which President Calvin Coolidge signed on Feb. 25, 1927 (Richardson, Gou, Komai, and Park 2013b). The Act extended indefinitely the original twenty-year charters of the Federal Reserve Banks. Unlike its predecessors, the Federal Reserve System became a permanent element of the United States financial and political system. However, commentators attributed its success in part to the willingness of the Fed to puncture the asset bubble that had formed after World War I. While bursting a speculative bubble would cause a painful liquidation of excessive debt, they believed that the sharp but short recession of 1920-21 had laid the groundwork for the sustained growth of the 1920s. Surely, they could repeat the experience when it came to deflating the equity bubble that formed on the New York Stock Exchange in the last part of the 1920s.

In the 1920s, families prospered. Automobiles, telephones, and other new technologies proliferated. The Roaring Twenties roared loudest and longest on the New York Stock Exchange. Ordinary men and women invested growing sums in stocks and bonds. A new industry of brokerage houses, investment trusts, and margin accounts enabled ordinary people to purchase corporate equities with borrowed funds. Purchasers put down a fraction of the price, typically 10 percent, and borrowed the rest. The stocks that they bought served as collateral for the margin loans. Borrowed money poured into equity markets, and stock prices soared. Share prices rose to unprecedented heights. The Dow Jones Industrial Average increased six-fold from 63 in August 1921 to 381 in September 1929 (Bureau of the Census 1975).

American economist Irving Fisher took note of how for the first time in world history corporations had begun to utilize science and technology in order to innovate in a systematic way. With unfortunate timing, after equity prices peaked, he proclaimed, "stock prices have reached 'what looks like a permanently high plateau.'" ² Where Fisher saw a future of innovation and prosperity, in a term common at the time, leaders of the Federal Reserve saw only "financial debauchery." They decided to deflate the presumed asset bubble on the New York Stock Exchange.

In the 1920s, the regional Fed Banks controlled the marginal cost of funds to banks through banks' borrowing from the discount window. With these discount-rate/borrowed-reserves procedures, the cost of funds depended upon the level of the discount rate plus a nonpecuniary surcharge that came from the administrative cost (heightened supervision) imposed on banks by the Fed for any but very short-term borrowing. The Federal Reserve Banks raised the cost of borrowing by both raising their discount rates and the administrative cost of borrowing. The Reserve Banks began moving up their discount rates in January 1929, with the New York Fed discount rate rising from 3.5 percent to 6 percent in September 1929. Urged on by the Federal Reserve Board, the

² Irving Fisher's quote appeared in the *New York Times* on Oct. 16, 1929, p. 8. Fisher made the comment in a speech at the monthly dinner of the Purchasing Agents Association at the Builders Exchange Club, 2 Park Avenue. At the time, Fisher was one of the nation's most well-known and widely quoted economists. His comments came in response to a prediction on Sept. 5 at the Annual National Business Conference by rival financial prognosticator Roger Babson that "sooner or later a crash is coming, and it may be terrific." Babson's comment was followed by a sharp decline in stock-market prices known as the Babson break. Fisher reiterated his faith in the stock market in a speech before the District of Columbia Bankers Association on Oct. 23.

regional Banks denied requests for credit from member banks, which it presumed financed speculative purchases of stocks on margin (Miller 1935).

The Fed's actions ended the speculative fever. The epic boom ended in a cataclysmic bust. Investors began selling madly (Richardson, Gou, Komai, and Park 2013c). Share prices plummeted. On Black Monday, Oct. 28, 1929, the Dow declined nearly 13 percent. On the following day, Black Tuesday, the market dropped nearly 12 percent. By mid-November, the Dow had lost almost half its value. The slide continued through the summer of 1932, when the Dow closed at 41.22, its lowest value of the 20th century and 89 percent below its peak. The Dow did not return to its pre-crash heights until November 1954.

Funds that fled the stock market flowed into New York City's commercial banks. These banks also assumed millions of dollars in stock-market loans. These sudden surges strained banks' balance sheets. As deposits increased, banks' reserve requirements rose; but banks' reserves fell as depositors withdrew cash, banks purchased loans, and checks (the principal method of depositing funds) cleared slowly. The outflows left many banks short of reserves.

To relieve the strain, the New York Fed purchased government securities on the open market, expedited lending through its discount window, and lowered its discount rate. It assured commercial banks that it would supply the reserves they needed. These actions increased total reserves in the banking system, relaxed the reserve constraint faced by banks in New York City, and enabled financial institutions to remain open for business and satisfy their customers' demands during the crisis. The actions also kept short-term interest rates from rising to disruptive levels, which had occurred historically during financial crises and helped to contain the crisis in the short run. The stock market collapsed, but commercial banks near the center of the storm remained in operation (Friedman and Schwartz 1963). At the time, however, the New York Fed's actions were controversial. The Board and several reserve banks complained that the New York Fed exceeded its authority (Carlson, Mitchener, and Richardson 2011).

The New York Fed was also under attack for fostering the presumed speculative stock market bubble by having lowering its discount rate from 4 to 3 ½ percent in summer 1927 in order to help Britain return to the gold standard. In this environment, the Reserve Banks lowered their discount rates only gradually in order not to revive speculation. The governors of the regional Banks, who were imbued with real-bills views, followed only partially the New York Fed's discount rate reductions. By September 1931, the discount rate in New York had declined to 2 percent while the average discount rate at the other Reserve Banks averaged 2 ¾ percent. In the 1920s, the governor of the Federal Reserve Bank of New York, Benjamin Strong, had been the dominant figure in the Federal Reserve System. He died in October 1928. Friedman and Schwartz (1963, 411 – 419) argued that had Strong lived he would have prevented what started as a regular recession from becoming the Great Depression (see also Hetzel 1985).

B. The Great Depression and the Failure of Policy

What later became known as the Great Depression began in August 1929 when the economic expansion of the Roaring Twenties ended (Richardson 2013b). A series of financial crises punctuated the economic contraction. They started with the stock market crash in 1929 and continued with regional banking panics in 1930 and 1931, and a series of national and international financial crises from 1931 through 1933 (Richardson 2013a; Wicker 1996). In the United States, the

downturn hit bottom in March 1933 when the commercial banking system collapsed and President Roosevelt declared a national banking holiday. The Federal Reserve's interest-rate increases, which brought down the stock market, had international repercussions. Because of the international gold standard, the Fed's actions forced foreign central banks to raise their own interest rates in order to prevent gold outflows. The resulting tight-money policies tipped economies around the world into recession. International commerce contracted, and the world economy entered into depression (Eichengreen 1992; Friedman and Schwartz 1963; Jalil 2012).

In summer 1931, financial panic, which had previously been regional in character, spread. Currency outflows forced banks into the discount window and raised the cost of funding through increased administrative pressure. Deflationary monetary policy in the United States as well as in France, which had returned to gold at an undervalued exchange rate in 1928 and which sterilized the resulting gold inflows, produced capital outflows from Germany. The resulting deflation forced an effective end to the gold standard in Germany through exchange controls (Hetzel 2002). In September 1931, Britain also left the gold standard. In response to gold outflows from New York banks, the Reserve Banks raised their discount rates, with rates both in New York and the other Banks reaching 3.5 percent in January 1932.

In spring and summer 1932, the Fed conducted open market purchases. It acted in response to pressure from Congress, which in early 1932 had passed legislation allowing the Fed to use government securities as backing for Federal Reserve notes (Richardson, Gou, Komai, and Park 2013a). Given the Fed's borrowed-reserves/discount-rate operating procedures, the increases in reserves lowered the cost of borrowing to banks. However, the reduction in the cost of funds was limited because, apart from a slight reduction, the regional Reserve Banks left their discount rates unchanged. The open market purchases were highly controversial. The natural concomitant to real bills was an aversion to anything suggestive of "managed money." Advocates of purposeful money creation designed to end deflation earned the derisive moniker of "inflationists." In early 1933, fear that newly elected president Franklin Roosevelt would abandon the gold standard caused renewed gold outflows and monetary contraction. A suspension of deposit withdrawals from banks starting in Michigan led to a cascade of state suspensions culminating in the March 1933 Bank Holiday, which suspended deposit withdrawals nationwide. As part of the holiday, Roosevelt took the country off the gold standard through an embargo on the export of gold.

The Depression lasted a decade. Unemployment soared and families suffered. Marriage rates fell. Why did the leaders of the Federal Reserve System allow the financial and economic system to collapse? A principal reason that Congress created the Federal Reserve was to act as a lender of last resort. Why did the Federal Reserve fail in this fundamental task? As explained below, no answer to this question is possible without an understanding of the structure of the Federal Reserve. Even more fundamental, it is important to understand the motivations of policymakers stemming from their desire to prevent a return of the speculative excess whose collapse they held responsible for the Depression.

At the start of the Depression, the Federal Reserve's decision-making structure was decentralized and often ineffective. Each district had a governor and a board that set the discount rate on borrowing subject to approval of the Federal Reserve Board in Washington. (In 1935, the title of the heads of the regional Reserve Banks was changed from "governor" to "president.") The Board lacked the authority and tools to act on its own and struggled to coordinate policies across districts. The individuals comprising the Board understood the need for coordination; frequently

corresponded concerning important issues; and established procedures and programs, such as the Open Market Investment Committee, to institutionalize cooperation. But when the governors of the regional Reserve Banks disagreed, districts could and sometimes did pursue independent and contradictory courses of action.

The Federal Reserve's leaders disagreed about the best response to banking crises. Some governors subscribed to a doctrine similar to Bagehot's dictum, which says that during financial panics central banks should loan funds to solvent financial institutions beset by runs. Most subscribed to the real bills doctrine. This doctrine indicated that central banks should supply more funds to commercial banks during economic expansions when individuals and firms demanded additional credit to finance production and commerce and less during economic contractions when demand for credit contracted. The real bills doctrine did not definitively describe what to do during banking panics, but many of its adherents considered panics to be symptoms of economic contractions when central bank lending should contract credit.

All Fed policymakers believed that the discount window should be reserved for the short-term liquidity needs of banks, not to address insolvency. They saw banks needing extended assistance as insolvent because of speculative lending for long-term capital projects. In this spirit, Eugene Meyer, chairman of the Board of Governors from September 1930 to May 1933, became chief of the Reconstruction Finance Corporation. It made equity investments in banks and thus kept the Fed out of providing aid to banks considered insolvent (Todd 1996).

Policymakers also defended the gold standard by raising interest rates and reducing the supply of money and credit in response to gold outflows in fall 1931 and early 1933. Herbert Hoover's secretary of Treasury, Andrew Mellon, who served on the Federal Reserve Board, advocated the "liquidationist" approach. Central banks should stand aside while insolvent financial institutions failed. This pruning of weak institutions would produce a healthier economy by eliminating speculative "imbalances." These intellectual tensions and the Federal Reserve's ineffective decision-making structure made it difficult, and at times impossible, for the Fed's leaders to take effective action.

Among leaders of the Federal Reserve, differences of opinion existed about whether to help and how much assistance to extend to financial institutions that did not belong to the Federal Reserve (Richardson and Troost 2009; Van Horn and Richardson 2009). Some leaders thought aid should only be extended to commercial banks that were members of the Federal Reserve System. Others thought member banks should receive assistance substantial enough to enable them to help their customers, including financial institutions that did not belong to the Federal Reserve, but the advisability and legality of this pass-through assistance was the subject of debate.

These differences of opinion plus the belief in the real bills doctrine combined to create a highly contractionary monetary policy. Friedman and Schwartz (1963), as well as subsequent authors like Bordo and Wheelock (2013), characterized this failure as a "sin of omission" caused by the Fed's failure to prevent widespread bank failures. Hetzel (2012) characterized it as a "sin of commission" caused by a policy of maintaining a high marginal cost of borrowing from the discount window produced by a fear of reviving the speculation, the collapse of which was the presumed cause of the Depression. From the fall of 1930 through the winter of 1933, the money supply (M2) fell by nearly 30 percent. Monetary contraction reduced average prices by an equivalent amount. This deflation increased debt burdens; distorted economic decision-making; reduced consumption;

increased unemployment; and forced banks, firms, and individuals into bankruptcy.

C. Reovery and Relapse

By 1933, there was a widespread association between deflation and depression. By going off gold, Britain had stabilized its economy. Abandoning the gold standard with the start of the Roosevelt administration changed the expectation of deflation to inflation and lowered real (inflation-adjusted) interest rates previously elevated by expected deflation. In summer 1933, output recovered rapidly. However, recovery boosted profits but lowered real wages as deflation turned into inflation in June 1933. Concerned about the unequal distribution of the gains from recovery, the Roosevelt administration began to intervene in labor markets to force up wages.

Industrial production rose 51 percent from March 1933 to August 1933. It then fell back and did not reach the earlier peak until January 1935. Given the association of deflation and recession, the Roosevelt administration wanted to raise prices but it had no conception of the difference between the price level and relative prices. The National Industrial Recovery Act, which passed in June 1933 with the practical effect of cartelizing industry, epitomized intervention in markets in order to raise “prices.” Authors like Peter Temin and Barrie Wigmore (1990), and Gauti Eggertsson (2008) attributed the recovery to the change in expectations, while authors like Milton Friedman and Anna Schwartz (1963), Harold Cole and Lee Ohanian (2004), and Scott Sumner (2015) attributed the initial stalling out of the recovery to an exogenous increase in costs and prices.

Roosevelt and his Treasury secretary, Henry Morgenthau, took control of monetary policy away from the Fed as part of a program to remove control over monetary policy from Wall Street banks. Also, by the spring of 1933, the Fed’s procedures for controlling the cost of funds to banks had broken down. As noted earlier, those procedures worked by forcing banks to obtain the marginal dollar of financing through recourse to the discount window. However, by spring 1933, banks had accumulated sufficient amounts of excess reserves to avoid recourse to the discount window apart from some frictional borrowing. Starting with the Roosevelt administration, the Federal Reserve Banks held steady their asset portfolio, which by then consisted mainly of government securities, with the intention of not interfering with Treasury debt operations.

Monetary policy then became the gold policy of the Roosevelt administration. The intention was to depreciate the dollar in terms of gold in order to raise the dollar price of internationally traded goods like agricultural products (Richardson, Gou, and Komai 2013c). Initially, that policy amounted to a commodity-price stabilization scheme designed to increase the dollar price of gold but with no implications for the monetary base. Output faltered after summer 1933, and in January 1934 Congress set a dollar peg for gold of \$34 an ounce (Richardson, Gou, and Komai 2013b). At that price, the dollar was undervalued (U. S. goods underpriced). As a result, and increasingly as a consequence of political turmoil in Europe, gold flowed into the United States. The Fed monetized the inflows. Bank reserves and the money stock climbed steadily and a sustained economic recovery ensued.

D. The Evolution of Tools and Sturcture

Under the original Federal Reserve Act, each regional Reserve Bank could operate independently with the discount rate as the chief instrument of policy. In the 1920s, individual Reserve Banks experimented with open market purchases and soon discovered the need to coordinate

them in order to regulate national conditions in the money market. In 1922, some of the Reserve Banks began voluntarily to coordinate open market operations. In 1930, the 12 regional Banks voluntarily formed the Open Market Policy Committee, which operated in consultation with the Federal Reserve Board in Washington. That existing decentralization of authority, however, led to persistent conflict with the Federal Reserve Board in Washington. The Banking Act of 1935 consolidated power within the Federal Reserve System in the Board of Governors, which had seven governors appointed by the President and only five voting regional Reserve Bank presidents. The new Federal Open Market Committee held the power to conduct open market operations (Richardson, Gou and Komai 2013a).

As the economy recovered from the March 1933 trough, the FOMC again became increasingly concerned about speculation. In June 1936, the victory of the Popular Front in France increased gold inflows into the United States. The new chairman of the Board of Governors, Marriner Eccles, was a Roosevelt confidante. Eccles convinced Roosevelt that as a safeguard against the speculative extension of credit, the Fed should again conduct monetary policy using its pre-March 1933 procedures. These discount-rate/borrowed-reserves procedures caused the cost of funds to banks to increase as banks made additional loans through the associated increased borrowing at the discount window. However, to revive these procedures, the Fed had to force banks into the discount window again. To do that, between August 1936 and May 1937, it initiated a series of increases in required reserves in order to reduce excess reserves while the Treasury sterilized (prevented monetization) gold inflows. Banks responded by selling government securities in order to rebuild reserves. The money stock contracted and the economy again went into recession.

3. Creation of a Modern Central Bank, a Burns Detour, and the Volcker-Greenspan Era

A. The Treasury-Federal Reserve Accord and William McChesney Martin

In spring 1942, after the entry of the United States into World War II in December 1941, the Fed committed to pegging the three-month Treasury bill rate at .375 percent and placed a cap of 2 percent on the yield of government bonds. With the end of the war, the Fed felt politically constrained to continue the peg especially because of the widespread expectation that the Depression would return with the end of wartime military expenditures. The Korean War, which began in June 1950, pushed the Fed into confrontation with the Truman administration over the rate peg.

When the Chinese entered the Korean War in November 1950, World War III appeared imminent. Driven by the prospect of wartime shortages, commodity price inflation soared. President Truman, who held populist views about money, expected the Fed to continue the rate peg in order to limit the cost of Treasury debt. However, World War II had changed the views of Fed policymakers. The real bills doctrine held that the market should determine the credit extension of banks disciplined by central bank restrictions that proportioned credit extension to the legitimate needs of business. If banks lent in excess of those legitimate needs, the result would be “inflation,” an unsustainable increase in prices of goods and assets that inevitably would collapse.

But wartime inflation had not arisen from speculative excess. Moreover, after the war, the price level did not collapse along with the economy. Inflation had instead arisen from a demand for resources in excess of the economy’s productive capacity. Control of that excess demand required control of bank credit extension, which required central bank, not market, control of bank reserves—a control impossible with an interest rate peg. Wartime inflation meant the return of the controls

abhorrent to Fed policymakers. Helped by the break between Congress and the administration over the firing of General McArthur, the Fed won a dramatic showdown with President Truman. To the consternation of Truman, William McChesney Martin, who replaced Thomas McCabe as Board chairman and who had negotiated the Treasury-Fed Accord for the Treasury, turned out to be a pillar of Fed independence (Hetzel and Leach 2001a).

Martin, working with his aid Winfield B. Riefler, created the modern central bank. From March 1933 through the Accord in March 1951, the Fed had not conducted monetary policy. Not only did Martin have to invent monetary policy from scratch, he had to do so without advice from academia. The Keynesian consensus assumed the irrelevance of monetary policy. Prolonged high unemployment in the Depression seemed to demonstrate the failure of the price system. Exhibit number one was the failure of low interest rates (a low price of credit) to revive the economy. In contrast, the low unemployment during World War II seemed to demonstrate the efficacy of deficit spending for controlling aggregate demand.

The procedures Martin termed “lean-against-the-wind” developed over time. The Fed reinstated its borrowed-reserves/discount-rate procedures but within the post-World War II consensus that gave government responsibility for economic stabilization. The FOMC began to move short-term interest rates procyclically (in line with strength or weakness in the economy) with the intention of controlling the quantity of bank credit, not its allocation to productive uses. Martin instituted the policy of bills only while developing the “depth, breadth, and resilience” of the government bond market. That is, the New York Desk conducted open market operations only in short-term government securities while leaving bond yields to be determined by the market. Martin watched bond yields for evidence of inflationary expectations. Concern for inflationary expectations replaced concern for speculative excess (Hetzel and Leach 2001b).

“Lean-against-the-wind with credibility” (LAW with credibility) entailed moving the funds rate away from its prevailing value in a measured, persistent fashion in a way that offset sustained deviations in the rate of growth of output from potential (sustained changes in the rate of resource utilization). Policymakers watched the behavior of bond rates for evidence that markets believed that changes in short-term rates would cumulate to the extent necessary to maintain price stability. “Lean-against-the-wind” developed in response to the 1953-54 recession. “With credibility” developed in response to the belief that the inflation that emerged in 1956 resulted from raising rates too slowly in the recovery from the 1953-54 recession (Hetzel 2008).

At the end of 1958, the Bretton Woods system became operational when member countries other than the United States restored convertibility on current account. The late 1940s devaluations of other member countries had left the dollar overvalued, and in 1959 gold outflows strengthened (Bordo 1993). Supported by the Treasury, the Fed raised rates early in 1959 at the start of the recovery and kept them at cyclically high levels in 1960 as the economy went in recession.

The first five post-World War II recessions exhibited diverse monetary origins. The 1949 and 1953 recessions occurred in the context of expectations formed in the gold standard in which deflation followed inflation. Two inflation shocks arose after the war. The first happened with the end of wartime price controls and the second with the intensification of the Korean War in fall 1950. In each case, when the inflation had passed, the expectation of deflation emerged. With minimal change in nominal interest rates, the real rate of interest rose sharply and recession ensued. The 1960 recession followed contractionary monetary policy intended to defend the dollar price of gold—the

nominal anchor in the Bretton Woods system.

The 1957 recession proved paradigmatic. In response to rising inflation, the FOMC raised rates steadily until the economy weakened and then imparted inertia to downward movements in rates while the economy continued to weaken. FOMC communication concentrated on packaging individual policy actions in the context of the contemporaneously most pressing problem for the economy while avoiding the language of trade-offs. Effectively, however, the FOMC was attempting to create a controlled, negative output gap in order to bend down inflation. In language anachronistic to the period, it was attempting to exploit a Phillips curve trade-off.

By the early 1960s, the Fed had restored price stability and the long-term price stability of a commodity standard seemed in place. With the presidential election in 1960 of John Kennedy, little changed for monetary policy. Although the Walter Heller Council of Economic Advisers wanted a monetary policy that would accommodate an expansionary fiscal policy aimed at rectifying what it viewed as the chronic underutilization of resources, the Douglas Dillon Treasury was concerned with maintaining the strength of the dollar. Kennedy, who wanted to avoid having a dollar crisis added to the Cuban missile crisis, supported the Treasury and the Fed.

The tumultuous events that followed with the accession of Lyndon Johnson to the presidency after the assassination of Kennedy in fall 1963 changed dramatically the political landscape. With the 1964 election of Johnson as president and with a democratic majority in Congress, the passage in early 1964 of the Kennedy tax cuts created pressure on the Fed not to “thwart the will of the political system” by offsetting the fiscal stimulus with higher interest rates. In the last half of the 1960s, social cohesion fractured over anti-Vietnam War protests, urban riots, and growing militancy in the civil rights movement. A political consensus emerged for the need for low unemployment as a social balm. What the political system demanded, Keynesian economics promised to supply.

Inflation began to emerge toward the end of 1965. In 1966, the Fed responded by tightening monetary policy as in 1957. However, in 1967, it backed off with fateful consequences. An increasingly Keynesian Board of Governors and staff found attractive the menu of outcomes promised by Keynesian economics based on the presumed optimal mix between fiscal and monetary policy. Easy monetary policy and tight fiscal policy promised the right amount of aggregate demand with moderate interest rates conducive to investment and supportive of housing. Encouraged by the Gardner Ackley Council of Economic Advisers, Martin bargained with the administration and the Congress using the promise of lower interest rates in return for a tax increase.

However, the difficulty of finding agreement between President Johnson and Wilbur Mills, chairman of the House Appropriations Committee, over expenditure cuts delayed passage of a tax increase until June 1968. By then, monetary policy had been expansionary for four years and inflation rose to 6 percent in 1970. In 1969, Martin attempted to return to price stability through contractionary monetary policy, but his time ran out. In February 1970, Arthur Burns became FOMC chairman.

B. Arthur Burns and the Great Inflation

Walter Heller had succeeded in giving the country a numerical target for unemployment of 4 percent. The question was what would be the cost in terms of inflation of this full employment. At the time, observations of paired values of inflation and unemployment, known as the Phillips curve,

formed a downward sloping pattern. This relationship promised 4 percent unemployment with only moderate inflation. However, in 1970, the combination of 6 percent inflation and 6 percent unemployment emerged. This combination created a political and economic tsunami. The Keynesian consensus coalesced around cost-push inflation as the explanation for the existence of inflation at what was widely assumed to be excess unemployment. The monopoly power of unions and large corporations had shifted the Phillips curve upward. The restriction of aggregate demand would control inflation but at the cost of socially wasteful and politically unacceptable unemployment. Incomes policy and in the limit wage and price controls would deal directly with the source of the problem—market power (Hetzel 2013a).

Arthur Burns was the most prominent advocate of price controls. He saw the hydra-headed monster of inflation everywhere except in monetary policy. Like Keynesian economists, he believed that inflation had to be cost-push not demand-pull because of its coexistence with 6 percent unemployment. Burns's most basic explanation for inflation was that the welfare state had removed the discipline on the price and wage demands of special interests because the government committed to preventing inflationary pressures from causing unemployment. Burns had said that he could not use monetary policy to lower unemployment without an incomes policy. In August 1971, Richard Nixon gave Burns the controls he had asked for (Hetzel 1998). Under the assumption that the Fed confronted cost-push pressures and a wage-price spiral driven by expectations unfettered by monetary policy, the spirit of monetary policy became a period-by-period choice of how much inflation to accept in order to avoid a politically unacceptable level of unemployment (Burns 1979). Burns believed that the country required an additional instrument in the form of price controls in order to achieve a politically acceptable balance between inflation and unemployment.

Burns saw himself as the country's foremost inflation fighter. When he felt that President Nixon could not make controls work when Watergate began to threaten his presidency, he made monetary policy restrictive. When President Ford rejected renewal of authority for controls, Burns pursued a restrictive monetary policy. When Burns ceded chairmanship of the FOMC to G. William Miller in early 1978, inflation was again rising. Prompted by the depreciation of the dollar, Miller pursued a restrictive policy in fall 1978. However, in December 1978 another oil price shock commenced. Faced with forecasts of recession and backed by a thoroughly Keynesian Board, Miller backed off from increases in the funds rate. As inflation rose, inflationary expectations became unhinged. Financial markets ceased seeing increases in inflation as transitory. Instead, expected inflation moved higher in line with actual inflation. The last vestiges of the stable nominal anchor created under a commodity standard and Bretton Woods disappeared.

C. Volcker and Greenspan: Return to nominal expectational stability

Paul Volcker became FOMC chairman in August 1979. Volcker had worked at the New York Desk in the 1950s and had been Treasury undersecretary for international affairs at the Treasury in the 1960s where he had been charged with overseeing the Bretton Woods system. Volcker had a bedrock belief in the importance of a stable foreign exchange value of the dollar and the role played by expectations. With a Treasury committed to floating exchange rates, Volcker pursued external stability of the dollar through internal stability.

Volcker understood that the 1970s policy of aggregate-demand management intended to produce a "low" unemployment rate by allowing a moderate amount of inflation had lost its ability to engineer such a trade-off. Each recovery had ratcheted upward the level of inflation. By summer

1979, markets associated expansionary monetary policy with higher inflation. Volcker understood the necessity of recreating nominal expectational stability independent of the phase of the business cycle and of transitory fluctuations in inflation. Initially, he committed the Fed to controlling inflation through achievement of substantive money targets, that is, targets not subject to base drift as actual inflation exceeded targeted inflation.

Because of the interest sensitivity in money demand introduced by the deregulation of interest rate ceilings on bank deposits in 1981, by behaving countercyclically, money started giving inappropriate signals about the desirable direction of interest rates. During the recovery from the 1981-82 recession, the Fed moved to create a stable monetary regime with a nominal anchor that did not derive from a monetary target. It moved to a rule committing it to maintenance of nominal expectational stability. It did so by challenging the bond market vigilantes. Despite declining inflation and cyclically high unemployment, when bond rates rose in May 1983 and again in March 1984, the FOMC raised its funds rate target. After a long detour that began with the Lyndon Johnson administration and continued in the Burns-Miller years, the Fed returned to the LAW with credibility procedures pioneered by Martin.

However, when James Baker replaced Donald Regan as Treasury secretary, Volcker could make the external value of the dollar an objective. The results were the September 1985 Plaza Accord and the February 1987 Louvre Accord. In return for promising to reduce its deficit, the United States asked Germany and Japan to stimulate their economies. The Fed then felt concerned that increases in the funds rate would serve as an excuse to those governments to raise rates. Monetary policy turned expansionary in the developed economies.

In August 1987, Alan Greenspan replaced Paul Volcker as FOMC chairman. In October 1987, the stock market crashed. Concerned for the economy, the FOMC lowered the funds rate. In the event, the economy grew strongly in early 1988. Volcker had lowered inflation to 4 percent. Greenspan, who had the objective of returning to price stability, confronted rising inflation. From 6 ½ percent in February 1988, Greenspan raised the funds rate to 9 7/8 percent in May 1989. The economy entered into recession after July 1990. During the ensuing “jobless recovery,” concerned about the reappearance of inflationary expectations, Greenspan lowered the funds rate only as bond rates declined.

In fall 1993, the economy strengthened and bond rates rose. In 1994, the economy grew strongly. From 3 percent in 1993, the FOMC raised the funds rate to 6 percent in early 1995. It raised the funds rate preemptively in that inflation was declining. That decisiveness cemented credibility for the Volcker-Greenspan regime based on nominal expectational stability.

In September 1998, in response to the Asian and Russian debt crisis, the FOMC lowered the funds rate based on a prediction that external weakness would cause domestic weakness. Instead, the economy grew strongly and the FOMC, behind the curve, started raising rates only in June 1999. By 2000, the unemployment rate had fallen to 4 percent. Associated with this mini go-stop monetary cycle, equity prices rose and fell dramatically. The economy experienced a mild recession and another “jobless” recovery weak by historical standards.

Figure 1 shows the price level and the ratio of the monetary aggregate M2 to real output (GNP or GDP). It records the outcome of the different monetary policies of the Fed. Significant price rises show the low interest rate policies and inflation of World War I and World War II, as well

as the Great Inflation of the late 1960s and 1970s when policy attempted to provide for a low, stable rate of unemployment with a politically acceptable amount of inflation. Figure 1 also shows the relative low price rises for the 1920s and for the period following the Volcker disinflation in the early 1980s. In January 2012, the FOMC set an inflation target of 2 percent. Starting in 2009, inflation regularly came in below target. With the end of the decline in oil prices and the appreciation of the dollar, the general expectation on the part of the FOMC was that inflation would return to target.

4. What Caused the Great Recession?

Different explanations can account for the same facts. The choice of explanations, however, is relevant because they possess different implications for the policies implemented and that shape future events. Historically, the default explanation of recession builds on the idea of an unsustainable accumulation of imbalances. They arise from market power in the form of herd behavior of investors that drives asset prices to unsustainable levels. An increase in debt feeds these speculative bubbles. More generally, market power whether in the form of monopolies that drive prices up or in the form of investor mania overwhelm the stabilizing properties of the price system. In the real bills variant of the speculative-imbalance story, the genesis of recessions originates with the Fed. It pushes interest rates down to an excessively low level and the resulting cheap credit spills over into speculative uses.

This version of the Great Recession starts with the FOMC's reduction of the funds rate to 1 percent in June 2003. In a giant carry trade, low interest rates encouraged the financing of long-term, illiquid assets with short-term borrowing. Atif Mian and Amir Sufi (2010a, 2010b, 2011) have developed one variation on this theme. Housing construction is too small a part of the economy to cause a recession. Mian and Sufi instead emphasized the boom and bust behavior of house prices and attributed the Great Recession to retrenchment by credit-constrained households placed "under water" by a decline in house prices. From 1997Q1 to 2007Q1, house prices rose 92 percent as measured by the FHFA index, which is relevant to their story because it excludes wealthy households not credit constrained. From the 2007Q1 peak in house prices until the business cycle peak of 2007Q4, house prices fell 1.4 percent.

Another version follows Gary Gorton (2010), who emphasized funding interruptions in the "shadow banking system" in which hedge funds, mutual funds, and investment banks used commercial paper to fund long-term, illiquid asset portfolios. Banks set up Structured Investment Vehicles (SIVs) to hold the AAA-rated tranches of subprime mortgages. In August 2007, cash investors, who invest funds short term, began to question the AAA rating of these assets. When the cash investors stopped buying the commercial paper of the SIVs, banks took the mortgages onto their own balance sheets. Banks experiencing funding difficulties borrowed from the Federal Home Loan Bank System. The event significant enough to have disrupted financial intermediation, however, occurred more than a year later on Sept. 15, 2008, with the Lehman bankruptcy.

That bankruptcy broke the decades-long tradition of regulators not allowing leveraged financial institutions to fail with losses to uninsured creditors, apart from failures of small community banks. Faced with the unexpected retraction of the financial safety net, cash investors ceased financing financial institutions with opaque, illiquid, long-term assets and turned to Treasury securities, conservatively managed banks, and the too-big-to-fail banks. FOMC Chairman Bernanke and Treasury Secretary Geithner moved quickly to preempt any fallout from a credit channel, that is, from a disruption to financial intermediation. Using a multiplicity of new lending facilities and the extension of deposit insurance, the Fed, Treasury, and the FDIC all attempted to undo this

rearrangement in funding. The Federal Reserve bailed out American International Group and Citibank. It created a number of vehicles to take over funding from the institutions abandoned by the cash investors.

These vehicles included the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), the Commercial Paper Funding Facility (CPFF), the Money Market Investor Funding Facility (MMIFF), and the Term Asset-Backed Securities Loan Facility (TALF). For example, TALF supported issuance of asset-backed securities collateralized by student loans, auto loans, credit card loans, and loans guaranteed by the Small Business Administration. The Fed also expanded existing programs: the term auction facility (TAF), which made long-term discount window loans to banks, and the Treasury Securities Lending Facility (TSLF), which lent securities to investment banks. Borrowing from these facilities produced a tremendous expansion of the Federal Reserve's balance sheet.

By summer 2008 and before the Lehman bankruptcy, the world had already entered into a deep recession, although that news became known only in early October given the lags in reporting on GDP. The arrival of that news then coincided with the flight of the cash investors to safe havens and the multiplicity of programs undertaken by the Fed, the Treasury, and the FDIC designed to undo that flight. The result was to create a presumption that the Great Recession resulted from a disruption to financial intermediation. That disruption originated presumably in a boom-bust cycle in housing made possible by the excessive risk-taking of large Wall Street banks and securities firms. However, it is important to remember that the programs detailed above only preempted the operation of a credit channel. In themselves, they did not provide evidence of a failure of financial intermediaries to get funds to credit-worthy borrowers with viable investment projects. In recession, borrowers want to pay down debt for fear that an interruption of cash flows will lead to bankruptcy. To date, there has not been research demonstrating that a credit channel exacerbated the Great recession. Jimenez et al (2010) illustrates the kind of research required.

A final version of the Great Recession fits the pattern of the 1957, 1970, 1973, 1981, and 1990 recessions. Concerned about inflation, prior to the cyclical peaks in these recessions, the FOMC raised the funds rate steadily until the economy weakened and then imparted inertia into downward movements in the funds rate. Although the FOMC does not use the language of trade-offs, it departed from the LAW with credibility rule in order to create a negative output gap. Unlike these earlier recessions, the high headline inflation in the Great Recession was not due to prior expansionary monetary policy but rather to a prolonged inflation shock that originated in the increased worldwide demand for commodities, especially by China. The inflation shock started in summer 2004 and peaked in summer 2008. Core inflation, as opposed to headline inflation, however, remained near 2 percent. In the spirit of the baseline rule that allows the price system to set relative prices, as explained by Aoki (2001), the Fed should have allowed the commodity price shock to pass through into headline inflation. In order to facilitate the required change in relative prices, the FOMC should have focused on stabilizing inflation in the "sticky-price" sector, that is, among firms that set prices for multiple periods.

The inflation shock reemerged in 2010 as the world economy was recovering. Stability in nominal GDP growth reflected the negative output gap required in order to limit the increase in headline inflation. As in earlier recessions, inflation, both headline and core, declined. Plausibly, the sacrifice ratio measuring the associated loss in output from reducing inflation was higher in the Great Recession than in previous recessions. The reason was that, given Fed credibility, the decline in

inflation occurred without a corresponding decline in expected inflation.

In December 2008, the FOMC lowered its funds rate target to a range of 25 basis points above zero. It then developed a system of forward guidance that communicated to the market its best estimate of the date of and conditions for liftoff of the funds rate from the zero lower bound (ZLB). These procedures were qualitatively like the earlier procedures. With its earlier procedures, the outcome of the FOMC's rule was a change in the funds rate target accompanied by communication to the markets about the likely persistence in those changes. With forward guidance, the FOMC communicated the likely persistence in the ZLB target. Quantitative easing counteracted the message of pessimism implicit in a long-delayed liftoff by conveying a "whatever it takes" commitment to the recovery despite the limitation imposed by the ZLB.

5. Tools and Rules

The central bank is unique in that it has a monopoly on control of the monetary base (currency held by the public and the reserves that banks hold with it) and as a consequence on control of the money stock. The central bank could exercise direct control over the monetary base or bank reserves. As noted above, in the period from March 1933 through 1941, the FOMC allowed capital flows into the United States to determine bank reserves as a consequence of its peg of the gold price of the dollar. With those operating procedures, reserve requirements can affect the monetary base as happened with the increases in reserve requirements in 1936 and 1937. Otherwise, the Fed has always used an interest rate as the instrument of monetary policy. The interest rate is a price—the price of a dollar today in terms of a dollar tomorrow. It follows that the monetary base is determined through the derived demand of the public for the money stock given the interest rate target. Monetary policy then concerns the rule the central bank follows in order to discipline that demand. The optimal rule, and in particular the rule that provides for price stability, depends upon the structure of the economy and the nature of the price level. The enduring controversy over monetary policy reflects the ongoing controversy over how to characterize these fundamental economic phenomena.

Although the funds rate is the policy instrument in itself, it is just the overnight rate of interest that banks pay to borrow from each other. As an overnight rate, it is inconsequential. Monetary policy is then the rule (reaction function) that the FOMC communicates to financial markets about how it moves the funds rate in response to incoming information about the economy. Monetary policy, understood as this rule, affects the economy through the way in which it affects the term structure of interest rates, that is, the entire distribution of interest rates by term to maturity. In order for monetary policy to be stabilizing, the rule must condition the term structure to respond to incoming "news" (new information) on the economy in such a way that all the movement is in the real (inflation-adjusted) term structure and none in inflation premia. Such behavior requires that the rule provide for a stable nominal anchor (make the price level well-defined) and allow the price system to work in an unhindered way. That is, it must allow market forces to determine the real interest rate and by extension other real variables like the unemployment rate. For example, when the economy weakens (rates of resource utilization decrease), the term structure of interest rates declines in advance of movements in the funds rate. The converse statement holds for a strengthening economy (rates of resource utilization increase).

Operating procedures, that is, the procedures for controlling the funds rate, have changed over time. Prior to the financial turmoil in fall 2008, the FOMC instructed the New York Desk to

undertake open market operations in order to maintain the funds rate on target. It drained reserves (sold securities) when the funds rate fell below target and added reserves (bought securities) when the funds rate climbed above target. In October 2008, the Fed began to control the funds rate by paying interest on the reserves that banks hold with it (IOR, or interest on reserves). It also set the discount rate somewhat above the IOR rate. No bank would lend in the Fed funds market at a rate below IOR nor borrow at a rate above the discount rate.

IOR gave the FOMC the ability to increase bank reserves through open market purchases without pushing down the funds rate. In a series of programs to buy government securities and mortgages known as quantitative easing, the FOMC increased the size of the System's portfolio threefold after summer 2008. In effect, IOR sterilized the additional reserves by causing banks to want to keep them on deposit with the Fed. In December 2008, the FOMC lowered the funds rate to a range from zero to 25 basis points (25 one-hundredths of a percentage point). An interest rate of zero is known as the zero lower bound because individuals will simply hold cash at lower interest rates. For that reason, and because of an unwillingness to charge banks for holding reserves with the Federal Reserve Banks, the FOMC turned to quantitative easing as the practicable alternative to lowering the funds rate to stimulate economic activity. It also used the language of "forward guidance" in order to convey to financial markets its intention to keep the funds rate near the zero lower bound for an extended period, thereby lowering the term structure of interest rates. The FOMC has announced that as it engages in the process of raising the funds rate it will continue with IOR. It can then avoid having to sell the Treasury securities and mortgages in its portfolio, instead letting them run off and reducing reserves only as they mature.

6. The Fed, Financial Markets, and Financial Regulation

The modern Fed's role as a regulator of financial institutions emerged from the reforms of the 1930s. When Congress created the Fed, it had intended that all commercial banks would join the Fed System. The Fed was not to regulate institutions involved with what the Federal Reserve Act labelled speculative investments, principally equities, derivatives, and commodities contracts. Fed member banks' activities in those areas were restricted and expected to diminish. However, only one-third of all commercial banks joined the Federal Reserve. The remainder stayed outside of the System but were linked to it by their correspondent relationships with Fed member banks, particularly those in the money centers of New York and Chicago. Furthermore, commercial banks – particularly large Fed members – expanded their links with investment banks, brokerage houses, insurance companies, and other financial institutions that were not regulated by the Federal Reserve or the federal government.

The Fed's responsibility for, obligations to, and jurisdiction over these institutions were a source of confusion and a key complicating factor in the Fed's decision-making in the 1920s and 1930s. In the 1930s, 1940s, and 1950s, Congress attempted to rectify the situation by successive reorganizations of the structure of financial regulation. The Federal Home Loan Bank Act of 1932 created the Federal Home Loan Bank Board, the Federal Savings and Loan Insurance Corporation, and the Federal National Mortgage Association (commonly called Fannie Mae). The Banking Act of 1933 separated commercial from investment banking. The Securities Exchange Act of 1934 regulated securities markets for the first time at the federal level. The Commodity Exchange Act of 1936 required all commodities futures and options contracts to be traded on organized exchanges. In 1956, Congress passed the Bank Holding Company Act, which gave the Fed authority over bank holding companies, which were corporations controlling multiple commercial banks. A concise

summary of the details of this legislation can be found in Komai and Richardson (2014). The goal of Congress was to clarify boundaries between different types of financial institutions and create a federal regulatory agency responsible for each segment of the financial industry.

Segmentation of financial intermediation worked for several decades. But, in the 1970s, expansionary monetary policy caused inflation to rise to disruptive levels. High inflation weakened savings and loans (S&Ls) because of the short-term maturity of their deposits with interest rates that could rise with inflation but with long-term mortgages with fixed, low interest rates. In order to ensure a supply of cheap savings to the S&Ls, regulators used their authority under Regulation Q to keep the ceiling on interest rates on S&L deposits above the ceiling that commercial banks could pay on their deposits while preventing both sets of rates from rising in line with inflation and market rates. As a result, depositors began to move funds out of both banks and S&Ls into the newly created money market mutual funds. High market rates of interest also encouraged the emergence of deposits like the negotiable order of withdrawal (NOW Account), which circumvented the complete prohibition of payment of interest on demand deposits.

New technology like ATMs eroded the unit banking system, which eventually made way for nationwide branching. The growing power of seniors (gray panthers) weakened the housing lobby. Universal banking abroad combined with changing beliefs about the costs and benefits of government regulation as well as changing beliefs about the efficacy of segmenting financial markets. The result was a series of reforms. Key legislation included the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980, which deregulated interest-rate controls; Garn-St. Germain, which deregulated S&Ls; the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA), which imposed prompt corrective action intended to limit the need for bank bailouts; the Federal Deposit Insurance Corporation Improvement Act of 1991, which dealt with bank resolution and risk-based insurance premia; the Riegle–Neal Interstate Banking and Branching Efficiency Act of 1994, which allowed interstate banking; and the Gramm-Leach-Bliley Act of 1999, which allowed commercial and investment banking under a single bank holding company.

These reforms effectively eliminated the segmentation of the financial industry imposed by Congress in the 1930s and thrust the Federal Reserve into a more central role in the regulation of financial institutions. The Dodd–Frank Wall Street Reform and Consumer Protection Act became law in July 2010. It limited the ability of the Fed and the FDIC to prevent large banks from failing, an informal policy known as too big to fail. For a concise summary of this legislation and its effects, see Komai and Richardson (2014) or the Federal Reserve History website at www.federalreservehistory.org.

7. Unanswered Questions

What can one learn from an overview of the more than 100 years of experience with a paper monetary standard? A fundamental question is how well the price system works. Ultimately, with the choice of monetary policy, policymakers are making a choice about how well the price system works. Because recessions are infrequent events, it is useful to take as a baseline the assumption that it works well most of the time.

It is then useful to assume that the Fed’s baseline rule, LAW with credibility, works most of the time by allowing the price system to work. As already noted, because financial markets

understand the rule, the term structure of interest rates responds to incoming news (new information) about the economy in a stabilizing way. Given credibility, changes in the term structure reflect changes in real forward rates (one-year rates expected in the future) rather than changes in inflation premia. In this way, the rule allows the price system to work.

What then about recessions, the obvious exception to “most of the time”? Are they caused by departures from the baseline rule? Alternatively, are they caused by the exercise of market power that undermines its stabilizing properties? If so, can departures from the rule offset market power in a useful way?

In practice, departures appear disruptive rather than stabilizing. Although this conclusion is controversial, clarity about the Fed’s rule would highlight departures and thus facilitate an understanding of whether bad economic outcomes represent adverse shocks that overwhelm the stabilizing properties of the price system or whether they represent departures from a baseline rule that allows the price system to work. At present, policymakers are acting on the assumption that a disruption to financial intermediation rather than contractionary monetary policy caused the recent Great Recession. As a result, there is considerable discussion of macro-prudential policies designed to limit the risk-taking of banks. Historical experience, however, shows that with scholarly research contemporary understanding about the nature of recessions and the appropriate policy for preventing them change considerably.

While the focus of the Fed – like all central banks – remains monetary policy, the Fed retains a role as a primary regulator of financial institutions. About this task, many questions remain unanswered. How does monetary policy influence the stability of financial markets? How does financial stability affect economic growth and the business cycle? Can the Federal Reserve effectively regulate financial markets, or should the task be turned over to other regulatory agencies or to the market itself while simply requiring banks to hold lots of capital?

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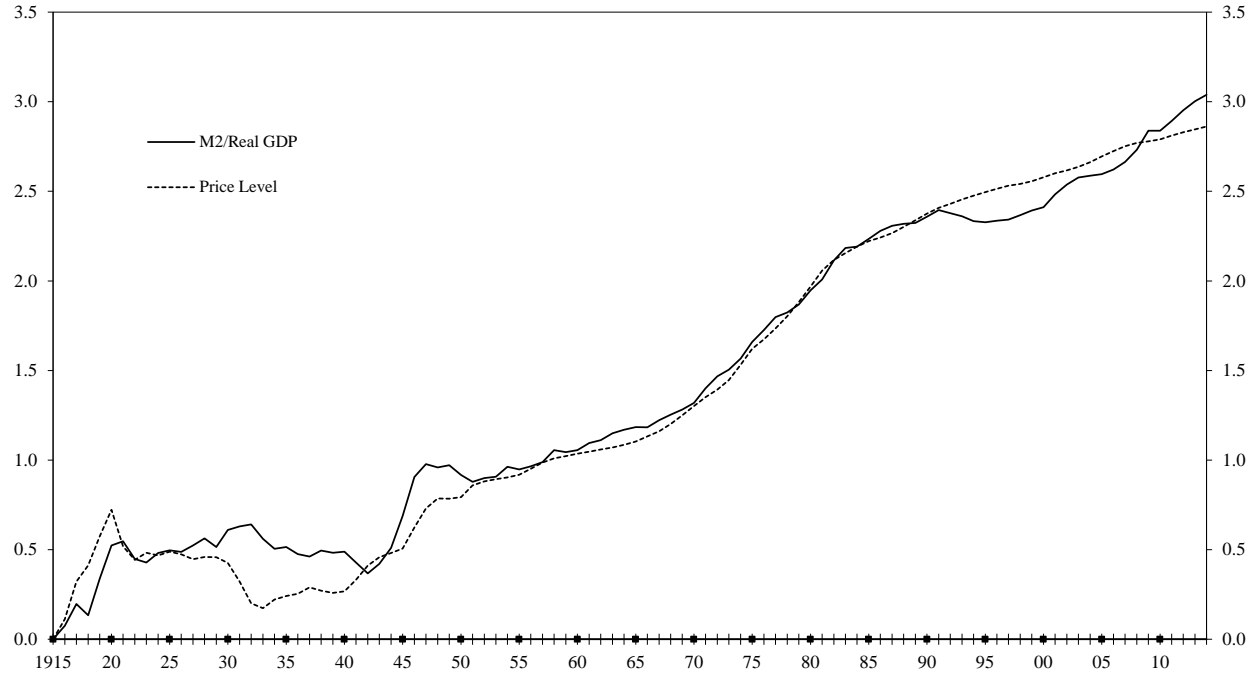
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Figure 1
M2 per Unit of Output and the Price Level



Notes: The series are the price level and M2 divided by real output. Observations are annual values of the natural logarithm of an index number that uses 1915 as a base value. From 1915 to 1929, real output is real GNP and the price level is the GNP deflator from Balke and Gordon (1986). After 1930, real GDP is from the Commerce Department. From 1915 to 1958, M2 is from Friedman and Schwartz (1970). Over this period, it is their M4 series, which corresponds most closely to the current definition of M2. From 1959 on, M2 is from the Board of Governors.

Table 1**Significant Legislation Affecting the Federal Reserve**

The Federal Reserve Act: It created the Federal Reserve System in December 1913.

The McFadden Act: In 1927, it extended the Fed's charter indefinitely.

The Glass–Steagall Act of 1932: It authorized Federal Reserve Banks to issue currency (Federal Reserve notes) backed by U. S. government securities.

The Glass-Steagall Act (Banking Act of 1933): It separated commercial and investment banking, created the Federal Open Market Committee, and created the Federal Deposit Insurance Corporation.

The Banking Act of 1935: It centralized authority for open market operations in the Federal Open Market Committee with its modern structure, which comprised 7 governors appointed by the President for 14 year terms and 5 of 12 regional Federal Reserve Bank presidents. It also finalized an array of reforms introduced in earlier New Deal legislation.

The Bank Holding Company Act In 1956: It formalized and expanded the Fed's uthority over bank holding companies

The Federal Reserve Reform Act of 1977: It made explicit the dual mandate of price stability and maximum employment.

The Full Employment and Balanced Growth Act of 1978: It required the Board of Governors to send a monetary policy report to Congress on a semiannual basis.

The Depository Institutions Deregulation and Monetary Control Act of 1980: It phased out ceilings on interest rates on bank deposits.

The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA): It required early intervention by the Fed when a commercial bank's capital fell to low limits.

The Riegle–Neal Interstate Banking and Branching Efficiency Act of 1994: It allowed interstate banking.

The Gramm–Leach–Bliley Act (Financial Services Modernization Act of 1999): It repealed the parts of the Glass-Steagall Act of 1933 thereby allowing commercial banks, investment banks, securities firms, and insurance companies to operate under a common bank holding company structure.

The Dodd–Frank Wall Street Reform and Consumer Protection Act became law in July 2010. It limited the ability of the Fed and the FDIC to prevent large banks from failing, an informal policy known as too-big-to-fail.