Federal Reserve Bank of Chicago

The Federal Reserve's Evolving Monetary Policy Implementation Framework: 1914-1923

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January 2017

WP 2017-01

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Abstract:

The Federal Reserve has relied upon a number of different monetary policy implementation frameworks throughout its history. This paper describes the original implementation framework that evolved between 1914 and 1923 in response to new policy objectives and changing market conditions.

* *The views expressed are those of the author and do not necessary reflect the views of the Federal Reserve Bank of Chicago or the Federal Reserve System*

The Federal Reserve has relied upon a number of different monetary policy implementation frameworks throughout its history. This paper describes the original implementation framework that evolved between 1914 and 1923 in response to new policy objectives and changing market conditions. The paper proceeds in four sections.

Section 1 describes the money markets at the time of the founding of the Federal Reserve System. The Federal Reserve System was an institutional response to flaws in the pre-1914 banking system that resulted in frequent panics and depressions.

Section 2 describes the initial monetary policy implementation framework that was adopted to address flaws in the existing banking system and stabilize money markets. The original framework worked well for its objectives but was insufficient to address new policy objectives adopted during World War I

Section 3 describes how the Federal Reserve's policy implementation framework evolved in response to new wartime objectives. Financing the Great War required an enormous increase in Treasury issuance. The Federal Reserve adopted a policy designed to keep long-term Treasury borrowing rates low. To achieve this objective, the Federal Reserve used existing facilities in new ways and also adopted a new instrument – the repurchase agreement – to support Treasury purchases and address an unanticipated consequence of new wartime taxes.

Section 4 describes the Federal Reserve's 1922-23 income driven open market purchases which resulted in the "discovery" that U.S. money markets were more geographically integrated than previously thought. Monetary policy objectives could therefore be achieved by adjusting either the discount rate or the quantity of open market purchases. After much debate about the role of balance sheet versus discount rate tools and the appropriate size of the balance sheet, the Federal Reserve adopted what would be known as the 1923 Framework which codified the goals of open market purchases and established the Open Market Investment Committee – a forerunner of the modern FOMC.

1. U.S. Money Markets before the Federal Reserve System

For fifty years prior to the enactment of the Federal Reserve Act, the United States endured the handicap of an unscientific currency system. Again and again it was pronounced by textbook writers and experienced bankers "the most barbarous system on earth " – Congressman Carter Glass[1]

The Federal Reserve System was an institutional response to flaws in the banking system that developed during the national banking era[2]. In his history of the founding of the Federal Reserve System, Paul Warburg noted that in comparison to the banking systems of Europe, where central banks stood ready to discount commercial loans and act as a lender of last resort, the pre-1914 American banking system seemed "bewildering and strange" and "appeared to do violence to almost every banking tenet held sacred"[3]. This low opinion of pre-1914 U.S. banking is shared by many modern historians and political scientists who lament the frequent panics of the national banking era[4].

Warburg described the "fundamental organic defects"[5] of the pre-1914 American banking system:

"In the United States, the note issue, based on government bonds, was inelastic, gold reserves were decentralized, and investments in unsalable single-name commercial paper were locking-up the funds of the banks, while call loans on the stock exchange constituted their chief liquid asset"- Paul Warburg[6]

[1] Glass (1927, p.59-60)
[2] The National Banking Era refers to the bank regulatory system in place between the passage of the National Banking Act of 1863 and the passage of the Federal Reserve Act.
[3] Warburg (1930, p.17). Warburg was one of the architects of the Federal Reserve System and an original member of the Board of Governors.
[4] For Example, Broz (1999, abstract) "From the Civil War to 1914, the United States had one of the worst financial systems in the world" or Meltzer (2003, p.9) "Financial panics, interest rates temporarily at an annual rate of 100 percent or more, financial failures and bankruptcies were much too frequent. Other countries had a lender of last resort to ameliorate financial crises or even prevent them."
[5] Warburg (1930, p.16)
[6] Warburg (1930, p.17)

In the opinion of Warburg and other architects[7] of the Federal Reserve system, pre-1914 financial markets were prone to frequent panics due to three flaws in the banking system;

1) The supply of currency was inelastic
2) Bank loans were largely in the form of illiquid commercial paper[8]
3) Banks, therefore, relied upon call loans on New York Stock Exchange collateral as their chief liquid asset.

Each of these defects can be attributed to National Banking Acts' regulations adopted a half-century earlier.

Inelastic Currency

U.S. currency was comprised of Treasury notes, gold and silver coins and private banknotes issued by national banks and collateralized by U.S. government bonds. Because the amount of Treasury notes, coins in circulation and U.S. government bonds were difficult to alter[9], none of these instruments could be quickly expanded to meet an increased demand for currency by the public.

Ironically, the inelastic currency of the national banking era was the result of National Banking Act regulations adopted to address financial panics. Before the Civil-War much of the nation's currency consisted of bank notes issued by state chartered "free banks". Free-bank notes were obligations of the issuing bank and were secured by a wide range of collateral specified by the regulations of the state the bank was located in. Because collateral and credit quality varied across banks the notes of different banks were not fungible and the currency of

[7] For example, Congressman Carter Glass – who introduced and drafted much of the Federal Reserve Act – argued that "the Siamese twins of disorder were an inelastic currency and a fictitious reserve system" (Glass, 1927 p.60)
[8] The early 20th century definition of commercial paper can be gleaned from the Federal Reserve Act, which defined commercial paper as "notes, drafts, and bills of exchange arising out of actual commercial transactions; that is, notes, drafts, and bills of exchange issued or drawn for agricultural, industrial, or commercial purposes, or the proceeds of which have been used, or are to be used, for such purposes" with a time-to-maturity of no more than 90-days for industrial and commercial purposes or 6-months for agricultural purposes.
[9] The amount of Treasury notes and U.S. bonds were set by statute and increasing coins in circulation required free stocks of gold and silver and time to mint.

the United State consisted of thousands of different notes with thousands of internal exchange rates[10]. To make matters worse, the opaque nature of bank balance sheets and collateral pools resulted in frequent bank runs when note holders lost confidence in the market value of collateral backing their currency and hurried to redeem their notes for gold.[11]

The National Banking Acts of the 1860s sought to address the panics of the free banking era by creating a safe uniform national currency. The Acts effectively banned banknotes issued by state banks[12] and required all national banks to back their note issuance with the same high quality U.S. government bond collateral. While the National Banking Acts succeeded in creating a safe uniform paper currency[13], the supply of national bank notes was limited to the amount of US Treasury bonds outstanding and could not be quickly expanded to meet an increased demand for currency from depositors during bank panics.

Illiquid Commercial Paper

The second flaw of the national banking era was the fact that most bank assets were in the form of illiquid short-term commercial loans collectively known as commercial paper. Unlike the modern term, pre-1914 commercial paper was largely illiquid and difficult to sell on the open market:

"It is a strange fact that, while in the development of all other commercial phenomena the United States has been foremost, the country should have progressed to so slight an extent in the form of its commercial paper. The United States is in fact at about the same point that had been reached by Europe at the time of the Medicis, and by Asia, in all likelihood, at the time of Hammurabi. Most of the paper taken by the American banks still consists of simple promissory notes, which rest only on the credit of the merchant who makes the notes, and which are kept until maturity by the bank or corporation that discounts them. If rediscounted at all, they are generally passed on without indorsement, and the possibility of selling any note depends on the chance of finding another bank which may be willing to

[10] Dwyer (1996) and Chabot & Moul (2014) describe the system of free banking-era state regulation. Gorton (1996) and Jaremski (2010 & 2011) examine the link between collateral differences and cross-bank exchange rates.
[11] Chabot & Moul (2014)
[12] Because of concerns about federalism there was no outright ban on State Bank note issuance. Instead, Congress effectively banned state banknotes by imposing a 10% tax on notes issued by State chartered banks while leaving note issuance by national banks tax-free. This tax was sufficiently large to force state banks to redeem their circulation.
[13] Although many national banks failed between 1863-1913, the collateral backing banknotes was sufficient that noteholders suffered no losses during the national banking era.

give the credit. The consequence is that, while in Europe the liquid assets of the banks consist chiefly of bills receivable, long and short, which thus constitute their quickest assets, the American bank capital invested in commercial notes is virtually immobilized." – Paul M Warburg *Defects and Needs of Our Banking System. Proceedings of the Academy of Political Science in the City of New York July 1, 1914.*

In normal times banks could sell or "re-discount" their highest quality commercial paper in financial centers but the market for commercial paper consistently vanished during major financial panics[14]. As a result, the chief asset of national banks was completely illiquid at the time that banks were most in need of liquidity.

Call Loans against New York Stock Exchange Collateral

The difficulty of selling commercial paper was well known during the crafting of the National Banking Acts. The drafters of the National Banking Acts therefore encouraged interbank lending where banks with excess reserves could make these reserves available to other banks via interbank deposits. The Acts encouraged an interbank money market by dividing the nation's national banks into three groups and providing regulatory incentives to pool excess reserves in central cities. The Act divided banks into Central Reserve City banks (those chartered in New York City, Chicago & St. Louis), Reserve City banks (those chartered in designated regional trade hubs) and country banks (those chartered outside of Reserve and Central Reserve cities). Country banks were required to hold 15% of their deposits plus banknotes outstanding in the form of liquid reserves (specie or treasury notes). To encourage interbank lending country banks were allowed to keep 3/5^{ths} of this 15% on deposit in reserve or central reserve cities. Reserve city banks were required to hold 25% reserves but they could keep half of their reserves on deposit with central reserve city banks. These regulations encouraged banks to take excess reserves that could not be employed profitably at home and deposit them at interest in reserve and central reserve city banks.

In practice, excess reserves migrated to New York City to be safely and profitably employed in the overnight call loan market secured by NYSE securities. Banks have always

[14] For example, daily quotes for single and double-name commercial paper in New York City can be found in the *Commercial and Financial Chronicle* and *New York Times*. No market was made in commercial paper during the height of the panics of 1869, 1873, 1884, 1896 and 1907.

desired liquid low-risk investments for their excess reserves. Before the Federal Reserve System and the development of the modern federal funds market, national banking era banks looked to the New York securities market for low-risk, overnight lending of excess reserves.

"Reserve funds need not inevitably have accumulated in New York to any larger extent than in Chicago and St. Louis, had not the call loan market of the New York Stock Exchange proved the only reliable money reservoir in which reserve funds in vast amounts could be easily placed, and from which—as long as things remained normal—these funds could be withdrawn at the pleasure and convenience of the lender." – Warburg (1930) p.13

Country banks embraced the opportunity to deposit reserves in New York City and gain access to the New York money market. By holding a portion of their reserves in New York, country banks were able to manage their reserve ratios by accessing the New York call money market.

"Under the National Banking Act the [New York Call] Money Market was the recipient of all those surplus funds of the country banks which they desired to invest in some liquid form which they could count upon as a secondary reserve. As a result, in times when the country banks had very little use for their funds at home, these funds were sent to New York, where they were either invested in call loans or put on deposit at the New York banks, who in their turn sought investment for them." – Griffiss (1923) *The New York Call Money Market* p. 65-66

Banks looked to the New York call market because call loans made against security collateral offered an attractive combination of high return, liquidity and low default risk. Banks could lend or borrow against security collateral at "poverty corner" (the corner of Broad and Exchange) and later the New York Stock Exchange money post.

"And bankers know that they can always depend to a greater or less extent on the supply of floating capital in ' the street.' In ordinary times, this supply is enormous, and ample for all demands. It is made up of the deposits of individuals and corporations from every section of the civilized world. On " Poverty Corner," as the brokers styled a favorite gathering-place of borrowers and lenders before the panic, one might see clerks of New York banking houses which represented similar institutions in various parts of the country, mingling with the agents of wealthy firms In London, Amsterdam, and Berlin. But it is dangerous to place too much dependence on this supply. It vanishes when most needed, and is ever keenly alive to the slightest suspicion of danger." - "Wall Street and the Crisis" Old and New Magazine January 1874 p.43

This system was fragile because it required New York Clearing House (NYCH) banks to expand or contract their balance sheets with the nationwide demand for currency. The tendency of loaned reserves to "vanish when most needed" exposed the NYCH banks to liquidity shocks originating anywhere in the nation and was often cited as the leading cause of pre-FDIC banking panics.

"The immediate cause of the money drain which started the [1873] panic was, as before, the sudden demand by out-of-town banks for their cash reserves on deposit. It was found that the $60,000,000 of call loans on which the New York banks had relied was 'entirely unavailable' "- Lainer (1922) A Century of Banking in New York p.238

The pooling of excess reserves in New York for lending against stock exchange collateral created systemic risk. National bank financed margin loans led to inflated stock market values in good times and frequent collateral fire sales in times of stress. This system was especially prone to panics in the harvest season when banks increased leverage to meet customers' demand for financing the purchase and movement of crops. With an inelastic currency the increase in bank lending resulted in a decrease in the ratio of currency backing bank liabilities. Both banks and depositors understood that the risk of bank failure increased with bank leverage and this increased risk was reflected in deposit and commercial loan interest rates which increased during the harvest season.

Unexpected demand for currency resulted in severe panics in 1873, 1884, 1890, 1893 and 1907 with dire consequences for the real economy. After the panic of 1907, Congress established the National Monetary Commission to study the world's banking and money markets and recommend legislative changes to stabilize U.S. money markets. The Commission's report to Congress devoted an entire volume to the dangers of pooling excess reserves in the New York call market. The volume's very first sentence summarized the contemporary view of the unstable New York call market centered, finance-led business cycle.

"Attention has been repeatedly called to the vicious circle in which the American money market moves; how the volume of banking credit is rigidly inelastic, being determined as to circulation by bond security and as to loans and discounts by a fixed ratio to legal reserve; how the surplus funds which pile up with seasonal fluctuation in the interior flow inevitably to New York City, there to stimulate speculation at times when general economic conditions suggest quiescence, and how, conversely, when returning activity draws back funds to the interior, the recovery is impeded by the strain and cost of speculative liquidation" – Bank Loans & Stock Exchange Speculation (1911) p. 3. National Monetary Commission

The Commission recommended a number of reforms including the establishment of a central reserve bank. After two years of debate, Congress acted on this recommendation with the passage of the Federal Reserve Act.

2. The Original Monetary Policy Implementation Framework

The Federal Reserve's original monetary policy implementation framework was reflected in the official title of the Federal Reserve Act: "*An Act To provide for the establishment of Federal reserve banks, to furnish an elastic currency, to afford means of rediscounting commercial paper…*" .

The architects of Federal Reserve Acts wished to stabilize financial markets by creating an elastic currency and shifting bank assets from systemically risky call loans into less systemically risky local commercial paper. The drafters assumed country banks would be more willing to make commercial loans and forgo placing these funds in call loans if commercial paper was viewed as a sufficiently liquid alternative.

The means to furnish an elastic currency and rediscount commercial paper was created by the discount window facility. The Act made "commercial paper" eligible collateral at the discount window and granted the Federal Reserve the right to issue legal tender[15] Federal Reserve notes collateralized by any discount window eligible collateral. These two provisions assured that the nation's currency supply could expand when there was an increase in demand for money or bank credit, and that banks would no longer view commercial paper as an illiquid asset on their balance sheets.

By enhancing liquidity, the discount window facility made commercial paper an attractive investment for member banks. At the same time, in the words of Carter Glass "*the Federal Reserve Act wrecked the old system of reserve deposits, which was a breeder of*

[15] Federal Reserve notes were not legal tender for private debts but were redeemable in gold at the Treasury and legal tender for all government obligations and debts owed to national banks.

panics"[16], by replacing reserve city banks as the legal repository of excess reserves. Deposits in private reserve city national banks no longer counted toward legal reserve requirements while deposits in Federal Reserve Banks counted toward reserve requirements. Finally, to further discourage bank loans on stock market collateral, the Federal Reserve Act excluded financial loans from the set of discount window eligible collateral.

Discount Rate Policy

The Federal Reserve's original discount window policy followed Bagehot's rule: *lend freely at a penalty rate, against good collateral*. Commenting on the original discount rate policy the 1919 annual report of the Federal Reserve Board noted:

It was the Board's view also that as a rule the discount rates of the Federal Reserve Banks should be higher than current market rates, thus offering no incentive to member banks to rediscount for the sake of making a profit in the transaction. – Annual Report of the Federal Reserve Board (1919, p.68)

There was no intention of using the discount rate as a policy tool to target the price level or steer economic activity. Instead, the discount window was operated as a standing liquidity facility designed to buffer the seasonal strains that had plagued the money markets for the previous half century.

The original framework worked well for achieving the Federal Reserve's initial goals. After the founding of the Fed the frequency of financial panics and the size of seasonal movements in money market rates both declined substantially[17].

Open Market Operations

The Federal Reserve Act granted the Reserve banks the right to purchase in the open market obligations of the United States, short-term State and municipal securities and any

[16] Glass (1927, p.62).
[17] Jeffrey Miron, "Financial Panics, the Seasonality of the Nominal Interest Rate, and the Founding of the Fed", American Economic Review, 1988, pp.125-140.

commercial paper eligible as collateral at the discount window[18]. The Board of Governors did not believe that it was necessary to engage in open market operations throughout much of the first year of the Federal Reserve System. In fact, the Board waited until December 18, 1914 to grant reserve banks the authority to purchase Government bonds "within the limits of prudence, as they might see fit"[19]. Five days later, on December 23, the Board issued "regulations relating to the purchase of certain warrants, revenue bonds, etc., issued by States, municipalities, and other political subdivisions"[20] and open market purchases began in early 1915.

Pre-WWI open market operations were not conducted to achieve monetary policy goals. Instead, early open market operations were designed to provide the Federal Reserve banks with sufficient earning assets to pay for their obligations under the Federal Reserve Act[21]. Through discount operations and open market purchases the Federal Reserve banks were expected to generate sufficient revenue to cover their operating expenses, pay 6% dividends to their member banks and pay franchise taxes to the Federal Government. These income needs largely drove Federal Reserve open market purchases during the first ten years of the Federal Reserve System.

The desire for profits was connected with the goal of financial stability. The reach of the Federal Reserve as lender of last resort was limited to its member banks. All national banks were members by statute while state chartered banks were given a choice of joining the Federal Reserve System. National banks therefore had one year from the passage of the Federal Reserve Act to either pay for their statutory requirement of Federal Reserve stock or convert to a state banking charter. If the Federal Reserve banks were unable to generate sufficient revenue to pay dividends on their stock state banks were unlikely to join the system and national banks would have incentives to switch to state charters.

[18] Federal Reserve Act of 1913, Section 14.
[19] *First Annual Report of the Federal Reserve Board*. P.16
[20] *First Annual Report of the Federal Reserve Board*. P.16
[21] Chandler (1958, p76-77)

The Governor of the New York Fed, Benjamin Strong, "believed that the system could gain neither acceptance or prestige so long as it was financially unprofitable, and he maintained that the prospect of receiving no dividends on their stock in the Reserve Banks was a significant deterrent to state bank membership and an irritant to the national banks that had been forced to join and buy stock"[22]. These concerns were well founded. A New York bank announced via the press that they had written down their New York Fed stock to zero because they saw no prospect for future dividends[23]. When the Board of Governors suggested in 1915 that a special levy be assigned to member banks to cover the operating deficits of the Federal Reserve Banks Strong complained that "this would be asking the member banks to pay the cost of advertising our failure"[24].

3. Financing the Great War

The Federal Reserve's original implementation framework was in its infancy when the United States' entry into World War I created new policy objectives. In addition to money market stability, the Federal Reserve adopted a wartime policy objective designed to keep long-term Treasury borrowing rates low without disrupting short-term money markets or encouraging an inflationary credit boom. To achieve this new objective, the Federal Reserve engaged in outright purchases of U.S. government securities and encouraged private purchases of Victory and Liberty Loan bonds by offering preferential discount rates against U.S. bond collateral.

Outright purchases were limited to limited to short-term securities such as Treasury tax-anticipation notes and certificates of indebtedness. These purchases were used to provide short-term support for Treasury issuance rather than a monetary policy tool.

[22] Chandler (1958, p. 76)
[23] Chandler (1958, p. 76)
[24] Chandler (1958, p. 77)

To support the price of longer-term government bonds the Federal Reserve offered preferential financing to member banks that used U.S. government bonds as collateral. In its 1918 *Annual Report,* the Board of Governors explained that it "*felt it to be its duty to adjust its discount rates in such manner as to assist the distribution of the various Treasury issues*"[25]. To do so the Federal Reserve offered "*a preferential rate of discount to notes made or offered by member banks secured by the Government's war obligations, and has continued to permit the Federal Reserve Banks to discount for nonmember banks, upon the indorsement of a member bank, notes secured in this manner*"[26].

The Federal Reserve understood that long-term government bonds would be an appealing investment for banks if the discount rate was below the yield on these bonds[27]. However, lowering discount rates below government bond yields ran the risk of encouraging speculative commercial lending and inflation. The Federal Reserve resolved this conflict by offering borrowers with U.S. bond collateral preferential discount rates and haircuts compared to borrowers with commercial or agricultural paper.

To further increase demand for Treasury borrowing the Federal Reserve encouraged member banks to take advantage of preferential discount rates and "place the bonds in the hands of actual investors who might not be in possession of the funds necessary to pay their subscriptions in full at the time of receiving the bonds"[28]. Generous terms were offered so member banks would "feel free to assist would-be bond buyers, knowing that they could protect themselves if necessary by rediscounting the paper with the Reserve Bank"[29].

The campaign to encourage private borrowing at preferential rates was marketed as the "borrow and buy" program. As the name implies, this program sought to encourage private purchases of Treasury debt by encouraging banks to offer attractive financing to their customers so that they may purchase U.S. government bonds.

[25] *Annual Report of the Board of Governors*, 1918, p.5
[26] *Annual Report of the Board of Governors*, 1918, p.5
[27] Analogous to the modern European Central Bank's LTLROs and "funding for lending" programs.
[28] Bopp (1947, p.4)
[29] Bopp (1947, p.4)

"During the war the Federal Reserve Bank as fiscal agent of the Government had to encourage a programme [sic] of 'borrow and buy' among banks in order that they might buy certificates of indebtedness far in excess of their available funds, and among individuals that they might buy bonds far in excess of their current savings" - Federal Reserve Bank of New York reflecting on the significance of the borrow and buy program[30]

The borrow and buy program was an immediate success[31]. Member banks realized that with the help of the Federal Reserve's liquidity facility they could both purchase and finance large quantities of newly issued U.S. debt and carry it on their balance sheet at a positive spread. The scope of the program was limited, however, to member banks eligible to borrow at the discount window. To expand the program to counterparties beyond the Federal Reserve System, The Federal Reserve added a new tool to its monetary policy implementation framework and began offering financing through repurchase agreements (repos). Repos were not unknown[32] but this was the first time they had been employed by the Federal Reserve. The Reserve Banks successfully used their new repo tool to offer preferential financing to non-member banks who wished to participate in the borrow and buy program.

The new repo tool proved valuable when a new wartime tax threatened the stability of short-term money markets. Congress passed a bevy of new taxes to finance the first World War. One tax – the stamp tax – had the unintended consequence of disrupting the market for short-term government debt. This small lump-sum tax was levied on certain financial transactions including discount loans from the Federal Reserve, but not repos. Although the amount of the tax was small, it was sufficiently large to disrupt the market for short-term Treasury tax anticipation notes and certificates of indebtedness. As a result, banks were reluctant to purchase these securities which they viewed as illiquid because the tax would consume their profits should they be forced to borrow at the discount window. The Federal

[30] The quote appears in Garbade (2012). It is taken from *Report on Business Conditions*, Federal Reserve Bank of New York. Nov. 20, 1919.

[31] "It has been estimated that on June 30, 1919, commercial banks had extended 2.5 billion dollars indirectly to the Government on the basis of this "Borrow and Buy" program. They also had extended 4 billion dollars directly through purchases for their own portfolios of Government war securities". Bopp (1947, p.4)

[32] The Bank of England introduced repos to stabilize money markets during the panics of the 1820s. The U.S. Treasury employed repos to relieve pressure on the New York money market in 1847 and U.S. national banks entered into repurchase agreements in 1913. (Garbade, 2012. P. 193 Box 13.2)

Reserve stepped in and employed the new repo tool to assure the market that affordable financing would be available to banks who owned short-term government debt.

The Federal Reserve's facilities successfully supported the Treasury market throughout the war. The Treasury was able to issue long-term bonds at 3 to 4.5 percent at a time when interest rates on overnight call loans and 90-day commercial paper ranged from 4 to 6 percent.

4. The 1922-23 Open Market Purchases and the 1923 Framework

1922-1923 marked a watershed in the Federal Reserve's monetary implementation framework. Before 1922, open market purchases were conducted to support Treasury issuance or to increase the revenues of Federal Reserve Banks and monetary policy was conducted via changes in the discount rate. This changed when the Federal Reserve "discovered" open market operations and discount rate changes could both be employed as monetary policy tools.

The Federal Reserve's support of Treasury issuance during World War I swelled the Reserve Banks' balance sheets and dramatically increased their income. Federal Reserve expenses also increased sharply as the Reserve Banks increased employment and other expenses. Following the war, a recession lowered demand for discount loans and the Reserve Banks found their reduced income precariously close to expenses. The Federal Reserve Banks responded by unilaterally purchasing government bonds in the open market to increase earnings.

"From the organization of the Federal reserve system to the closing months of 1921, government securities, except for the periodical brief appearance of overdraft certificates, were a fairly constant item in the earning assets of the reserve banks, and did not fluctuate in response to credit conditions. It was not until the early part of 1922 that this item in the statement began to show considerable fluctuations. At that time member banks were rapidly repaying their borrowings from the reserve banks and the latter's total earning assets were at a relatively low level and rapidly declining. In these circumstances the reserve banks invested in government securities in considerable volume partly for the purpose of assuring to themselves sufficient earnings to meet their expenses and dividends. During the preceding years of rapid growth the system's expenses had become heavy, largely on account of services not connected with the discounting of paper; and the continuance of these expenses at a time when earning assets were rapidly diminishing induced the reserve banks to endeavor to build up their earnings through the purchase of government securities." – Goldenweis (1925, p.58)

These open market purchases led to, in the words of one participant, an "*almost accidental discovery*" that "*the country's pool of credit is all one pool and money flows like water throughout the country. When Government securities were bought in Dallas, the money so disbursed did not stay in Dallas but flowed through the whole banking system and reappeared in New York or Chicago or Kansas City, and vice versa*."[33]

When a Reserve Bank injected reserves via open market purchases in one district the increase in securities holdings were matched almost dollar for dollar by a decrease in discount loans somewhere in the system. Benjamin Strong described this relationship to Congress in 1926:

> "*Referring to this compensating effect of discounts versus the sale and purchase of Government securities, let me give you the changes that took place. Between January, 1922, and May, 1922, our holdings of Government securities increased $400,000,000. All of our other earning assets decreased $430,000,000; in other words, there was a net change of only $30,000,000, and that was a decrease.*
>
> *Between June, 1922, and December, 1922, the next period, we reduced our holdings of Government securities by $330,000,000 and ll our other earning assets increased exactly $330,000,000. One offset the other.*
>
> *In the period March, 1923, to July, 1923, we further reduced our Government securities holdings $260,000,000, and in that period all other earning assets went up $160,000,000. That is in the period of the year when there is always liquidation of assets. Between December, 1923, and September, 1924, we increased our Government security holdings by $510,000,000. In that period our discounts went off $750,000,000, and, roughly, the difference, that is, the reduction of earning assets which exceeded the amount of increase of Government securities (nearly $200,000,000), was almost wholly caused by imports of gold.*
>
> *Between November, 1924, and March, 1925, we had a reduction of our Government securities of $260,000,000 and an increase of other earning assets of exactly $260,000,000.* – *Stabilization*, Hearings before the House Committee on Banking and Currency, 69 Cong. 1 sess. Pt.1 (1927), p. 331-32.

While open market operations had little effect on the balance sheet and operating revenues of the Federal Reserve, open market purchases did appear to have a marked effect on money market rates. Strong described the effect of open market purchases on short term rates to the Governors Conference in November 1923:

[33] Burgess (1964, p.220)

"It has been disclosed by the figures in the past that the first result of buying by Reserve Banks, no matter which Reserve Bank buys, is to bring about a very sharp reduction in the borrowings of member banks from the Reserve Banks in New York, first, and in Philadelphia, Boston and Cleveland. The Proceeds of the purchases will drift at once to the money centers, and as discounts are repaid, it eases money in three or four principal money markets,… it reduces the rate on bills, and the effect of easier money at the money center spreads throughout the whole country, and the banks in the money centers have a surplus to loan. That is all it amounts to." – Benjamin Strong[34]

At a latter Governors conference in 1926, Strong speculated that the money market response was so strong because member banks with discount window loans outstanding "*endeavor to free themselves from such indebtedness"* by *"curtailing loans*" in the money markets[35]. The Federal Reserve had, much to their surprise, discovered that the nation's money markets were integrated and responded in a predictable manner to open market operations. This was a welcome discovery as there was considerable internal debate at that time about the effectiveness of discount rate changes as a tool to influence money market rates[36]. In his 1925 textbook, *Federal Reserve System in Operation,* E.A. Goldenweiser noted the uncertain effects of discount rates changes on equilibrium money market rates.

To what extent market rates are influenced by changes in the discount rate, and, conversely, how much changes of rates in the open market are reflected in reserve bank rate advances or declines is a problem that requires much further study before a definite conclusion can be reached. It suffices for the present purpose to call attention to the existence of the relationship without undertaking to determine the extent and manner in which it is a causal relationship. – E. A. GoldenWeiser[37]

The discovery that open market purchases influenced money market rates and that purchases in Dallas could result in lower demand for discount loans in New York had obvious implications.

1. The was one national monetary policy rather than twelve regional policies
2. Policy could be implemented with discount rate changes or open market operations
3. Any policy actions would have to be coordinated across the various Federal Reserve Banks

[34] Quoted in Chandler (1958, p. 239)
[35] Chandler (1958, p.239)
[36] Andersen (1965, p.45) tells us that "In debating effectiveness of the discount rate at the annual joint conference of the three policymaking groups in the fall of 1922, two officials with opposing views referred to their correspondence with a "well-known and highly esteemed" professor in one of the leading universities in support of their positions. It turned out that both had been corresponding with the same professor."
[37] Goldenweiser (1925, p.51).

At the next Governors conference the Federal Reserve Banks created a committee to centralized execution of purchases and sales of Government securities. Known as the Open Market Investment Committee, this committee was an early forerunner of the modern FOMC. The committee originally consisted of the Governors of the Federal Reserve Banks of Boston, Philadelphia, Chicago, and New York, and later the Governor of the Federal Reserve Bank of Cleveland was added[38]. In his 1965 history, *A Half Century of Federal Reserve Policy Making,* Clay Andersen described the two motivations for forming of the committee:

"There were two main reasons for establishment of the committee. An important one was a vigorous complaint by Treasury officials that the Reserve Banks were creating artificial conditions in the Government securities market and thus making Treasury financing more difficult. In fact, Treasury officials wanted the Reserve Banks gradually to dispose of the Governments they had acquired and get out of the market altogether. A second reason was that Reserve Banks were competing against each other. Most of the purchases were made in New York City because it was the principal money-market center. The committee's task was to develop more orderly procedures and bring about better coordination of purchases in order not to interfere with Treasury operations and to avoid competition among the Reserve Banks. The Federal Reserve Bank of New York was designated to make purchases and sales, purchases being allocated among participating Reserve Banks according to an agreed formula" – Andersen (1965, p51)

The Federal Reserve Act vested control of discount rate policy in the hands of the Board of Governors but left open market purchases entirely up to the discretion of the Reserve Banks. Therefore, the Open Market Investment Committee effectively moved monetary policy decision making from the Board of Governors to the Reserve Banks. The Board of Governors objected and in March 1923 attempted to place the Open Market Investment Committee under Board of Governors control. The Board asked the Reserve Banks to sell their Treasury holdings and insisted that future open market purchases be conducted with the same policy intentions as changed in the discount rate policy.

The Reserve Banks protested. Benjamin Strong argued that open market operations were a more effective method of implementing policy and that large holding of Treasuries were necessary for financial stability reasons. He elaborated on the effectiveness of open market operations in 1927 Congressional testimony:

[38] Andersen (1965, p.51)

"The influence that the reserve system exercises in the money market may be described, therefore, in this way: If speculation arises, prices are rising, and possibly other considerations move the reserve banks to tighten up a bit on the use of their credit, and we own a large amount of Government securities, it is a more effective program, we find by actual experience, to begin to sell our Government securities. It lays a foundation for an advance in our discount rate.

If the reverse conditions appear, as I shall describe, and as we thought were developing late in 1923, then the purchase of securities eases the money market and permits the reduction of our discount rate. But we still have much to learn. This is a big country and a vast organization to deal with, a vast credit organization, and I feel we have still much to learn about how these things should be done. So far as we have gone in our experience and under world conditions as they are, it seems to me that the foundation for rate changes can be more safely and better laid by these preliminary operations in the open market than would be possible otherwise, and the effect is less dramatic and less alarming to the country if it is done in that way than if we just make advances and reductions in our discount rate." – Benjamin Strong[39]

Strong also feared that discount rate increases alone would be unable to stem speculation and only a large balance sheet of government securities would give the Federal Reserve the ammunition necessary to reign in speculative bubbles. In a 1922 letter to Undersecretary of the Treasury Gilbert, Strong argued that one of the primary purposes of the New York Fed's open market purchases was "*that we may have a combined loan and investment account sufficient at a later date when it became necessary to prevent dangerously low rates in the market and check unwholesome speculation*"[40]. He went on to argue that in the absence of large holdings of government securities the Federal Reserve may be unable to respond to speculative bubbles. "*If we relinquish our hold on the market now, when we should not do so, we will latter deliver the situation to the speculator without any means of checking it*"[41]. He closed by warning that the Treasury's proposal for the Federal Reserve to sell its government bond portfolio would end in "disaster".

[39] *Stabilization*, Hearings before the House Committee on Banking and Currency, 69 Cong. 1 sess. Pt.1 (1927), p. 332-33.
[40] April 18, 1922 letter quoted in Chandler (1958, p.211)
[41] Chandler (1958, p.211)

Led by Strong, Reserve Bank governors balked at the Board of Governors and Treasury requests and noted that the Federal Reserve Act left open market decisions in the hands of the Reserve Banks.

Détente was reached in the fall of 1923 when by mutual agreement the Board of Governors and Reserve Banks reached what would become known as the 1923 framework:

- A "systems open market account was created"
- Open Market Purchases we entrusted to five[42] Reserve Bank Governors whose actions were approved "from time to time" by the Federal Reserve Board.
- Ownership of the systems account was prorated among the twelve Reserve Banks provided their boards voted to participate.

At the same time the Board of Governors issued a statement confirming that open market purchases would hereafter be used to further monetary policy objectives rather than as an income generating operation: "*The time, manner, character, and volume of such operations by the Reserve Banks should be governed "with primary regard to the accommodation of commerce and business, and to the effect of such purchases or sales on the general credit situation."*[43]

The agreement called for the Open Market Investment Committee to meet and make recommendations with regard to open market purchases. Recommendations were then approved by the Board of Governors. Each Reserve Bank reserved the right to participate or not in the proposed operations. By the late 1923, a twofold objective of monetary policy had emerged[44]:

"First, they [open market operations] should be used to help stabilize the business situation by putting additional funds into the market when business liquidation is going too fast, and withdrawing funds when business is too active or speculative. Second, open market operations were a suitable tool for offsetting seasonal stringencies, and other temporary disturbing forces such as Treasury operations at tax-payment dates."

[42] The Committee was expanded to include all twelve Governors in 1930.
[43] Burgess (1964, p.221)
[44] Andersen (1965, p.48)

The Open Market Investment Committee made recommendations in terms of quantities purchased rather than targeted interest rates and preferred to deal in short-term securities.[45] These procedures remained essentially unchanged until 1935 when the Banking Act of 1935 replaced the Open Market Committee with the modern Federal Open Market Committee (FOMC).

Conclusion

The Federal Reserve adopted a number of new policy implementation tools in response to the 2008 financial crises. Since 2008, the Federal Reserve introduced new tools - such as interest on excess reserves and used existing or long dormant tools in new ways – such as Reverse Repurchase agreements.

This history illustrates that the present crisis is hardly the first time that the Federal Reserve's monetary policy implementation framework has evolved in response to new policy objectives and market condition. The discount window, originally introduced to address a flaw in Civil War era banking legislation, proved invaluable in supporting long-term government bond prices during the First World War. Large scale asset purchases, originally adopted to cover Reserve Bank operating expenses evolved into a monetary policy tool and the committee formed to manage purchases for income reasons eventually developed into the primary monetary policy decision making body of the Federal Reserve.

[45] For example, in the fall of 1923 the Committee recommended purchases up to $100 million. Andersen (1958, p. 49)

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