

VISUAL HISTORY of the FEDERAL RESERVE SYSTEM

1914 - 2009

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want to buy a paper edition, consider donating to me at www.financialgraphart.com/donate. It took me many months to compile the data and design it, any support would be much appreciated. For collectors, a limited 10 chart edition signed and numbered by the designer is available at www.financialgraphart.com/collector.

John Paul Koning, 2009

FOR BETTER OR FOR WORSE, the Federal Reserve has been governing the monetary system of the United States since 1914. This chart maps the rise of the Fed from its origins as a relatively minor institution, often controlled by Presidents and the United States Department of the Treasury, into an independent and powerful body that rivals the Presidency in terms of prominence.

Multiple data series including the Fed's balance sheet, interest rates and spreads, reserve requirements, chairmen, inflation, recessions, and more help chronicle this rise. While this chart can only tell part of the complex story of the Fed, we trust it will be a valuable reference tool to anyone curious about the evolution of this very influential yet controversial institution.

IN ITS FIRST TWO YEARS, the Fed was a passive institution. It set its lending rate above the market rate, making it unprofitable for banks to turn to it for loans. As a result, discounts were negligible. This changed in 1917 with the entrance of the US into World War I. The Fed, now largely independent from other branches of the government, was then controlled by the Treasury Secretary. To help pay for looming war bills, the Fed was converted into a war-finance body.

The events after the 1929 stock market crash brought major changes to the Fed's balance sheet and operating procedures. The Emergency Construction, Emergency Banking, and Industrial Advances Acts granted the Fed power to extend loans to non-member individuals, partnerships, and corporations under certain conditions by adding sections 13.1, 13.13, and 13b to the Federal Reserve Act. The First Glass-Steagall Act brought in even larger modifications, firstly by allowing the Fed to make advances on "any satisfactory collateral" to member banks through Section 10b advances, and secondly by allowing government securities purchased in the open market to stand as sufficient backing for Federal Reserve notes. The latter freed the Fed to monetize government debt via open market operations and not just discounts. Government debt on the Fed's balance sheet would grow inexorably from then on, further moving the Fed away from its "real bills" origins.

Amendments to the Federal Reserve Act paved the way. The original Federal Reserve Act emphasized that discounts were made on "real bills" principles; only short term bills based on commercial transactions would be eligible for Fed loans. In 1916, authorities began to break with this principle when the Fed was given permission to lend to banks on the security of government debt. In 1917, these "Section 13b" advances were made "eligible" as collateral for notes.

Also significant were legislative changes that began to de-link the dollar from the gold standard. In 1933, private holdings of gold were criminalized. Gold was brought to the Federal Reserve for notes, and on January 30, 1934 this gold was transferred to the US Treasury in return for certificates. The next day the dollar was devalued from \$20.67/oz to \$35/oz. The capital gain, therefore, was credited to the Treasury, not the Fed. The \$2.3 billion in Treasury cash, a liability of the Fed, became the war-chest of the Treasury and its new Exchange Stabilization Fund, which would dominate monetary policy to 1951, rendering the Fed a passive partner.

MUCH LIKE WWI, the Fed was harnessed to finance the Second World War. Reserve requirements were reduced to allow member banks to expand lending for the war effort, and a preferential discount rate of 0.5% was set for loans collateralized by government debt. Unlike WWI, the latter was hardly used. Far more attractive to member banks were the open market buying rates set by the Fed. By offering an end to the government's 4% bills and long term bonds at 2.5%, the Fed ensured that government debt prices would never fall. This price-fixing scheme allowed the government to issue huge amounts of Victory Loans to finance the war, and guaranteed the capital safety of the private sector's investment.

The result was one of the fastest increases in the government bond portion of the Federal Reserve's balance sheet to date. At the same time, inflation jumped to its highest level since the early 20s. War-time wage and price controls succeeded in reducing over inflation, but the effects manifested themselves as shortages and reductions in quality. The removal of price controls in 1946 resulted in a large spike in inflation rates. After the war's end, Fed officials increasingly agitated for more independence from the Treasury in setting monetary policy. With the onset of the Korean War, it pressed for an end to the WWII-era 2.5% rate peg, which the Treasury expected it to maintain to help finance the newest war effort. The conflict

IN EARLY 1968, private sector purchases of gold in London exploded. The London Gold Pool, formed by the Fed and a number of European central banks to cap the London price at \$35, was unable to suppress the buying. The pool was disbanded in early 1968 and the market price leaped above \$40, the result being two prices for the dollar; the official one at \$35, and a significantly higher market price. The Fed simultaneously reduced the 25% gold backing requirement to 0% as outflows of gold threatened to bring gold holdings below their legal limit. The dollar remained convertible into gold though, and central banks continued to bring their dollars to New York to claim the metal. Vietnam War expenses and setbacks further undermined confidence in the dollar, and in 1971 Nixon decided to solve the outflow problem by simply removing the dollar's convertibility. With one pillar of Bretton Woods undermined - convertibility to gold - only one remained: fixed exchange rates to the dollar. The Smithsonian Agreement tried but failed to fix rates, and in 1973 all currencies were all allowed to float. Bretton Woods was dead. Gold would cease to be an important asset on the Fed's balance sheet, replaced by government debt.

On the domestic front, the Fed's discount window was increasingly utilized to support insolvent institutions, breaking with prior central banking tradition of lending to illiquid but solvent banks only. Attempts failed to recruit the Fed to help bail out Penn Central, but in 1974 the discount window was crucial in supporting Franklin National, a failing bank, Continental Illinois, crippled by the collapse of Penn Square two years before, was kept on life support by the Fed in 1984, and most of the large Texas banks found support from the Fed when they failed in 1988. All these actions gave the impression that the Fed had adopted a policy of "too big to fail", in which large and politically connected institutions received favourable treatment from the Fed when they went bust, but smaller banks didn't.

Several major changes to the Federal Reserve Act modified the Fed's mandate. A 1977 amendment added section 2A to the Act, stipulating for the first time the Fed's dual role of promoting stable prices and maximum employment. The Monetary Control Act of 1980 allowed foreign government debt to serve as collateral for reserve notes, removed the penalty on 10b advances, and expanded the discount window to allow non-member banks to access it. Finally, a small change in 1991 to Section 13.3 - a dormant 1930s era power that allowed the Fed to lend to individuals, corporations, and businesses on limited collateral in emergencies - allowed for an almost unlimited range of collateral to be accepted by the Fed. This small but vital change would serve as the legal foundation for the Fed's massive extension of loans during the 2007-09 credit crisis.

On the liabilities side of the balance sheet, the low level of reserves encouraged by the 1994 introduction of sweeps, in which banks "swept" cash from checking accounts into savings accounts each night to take advantage of lower reserve requirements on the latter, has dramatically reversed. Uncertainty and a lack of confidence have led banks to accumulate huge quantities of excess reserves at the Fed rather than lending these funds out. This uncertainty has yet to be dispelled.

MUCH OF THIS ERA'S HISTORY remains to be written, but it includes the largest expansion in the Fed's balance sheet to date, dwarfing the WWII growth of discounts, the 1934 gold revaluation, and the WWII expansion. The expansion's effect on employment, GDP, credit, and confidence in the dollar continue to play out. Several changes to the Federal Reserve Act are notable. In 1999, prior to the year 2000 date change, Section 10a and 10b advances were made eligible to serve as collateral for Federal Reserve notes, increasing the Fed's ability to issue notes should the new century start in crisis. This was superseded in 2003 when any asset held by the Fed was made eligible as collateral for notes, removing from the Act the last vestiges of the "real bills" doctrine which originally limited eligibility to short term commercial bills. Finally, the Fed was given a new monetary tool in 2008 when it was authorized to pay interest on reserves for the first time. The cumulative changes to the Federal Reserve Act have given the Fed the ability to act in ways it never would have been

capable of in times past. When solvent banks' demand for liquidity exploded, it was able to create facilities like TAF to meet this demand. But loans to Maiden Lane III, authorized under Section 13.3, have supported the questionable assets of insolvent non-banks Bear Stearns and American International Group. Section 13.3 is also the legal basis for loans made by a myriad of facilities, including the CPFF, AMLE, PDCE, and TALF (see notes in legend for definitions). At the same time, Fed purchases of government debt have fallen. Not since the early 1920s has the Fed held such a large proportion of private sector debt on its balance sheet.

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Legend

Federal Reserve Balance Sheet

- | ASSETS | | LIABILITIES | |
|---|---|---|---|
| Discount Loans and Advances ¹ | Total Reserves ¹⁶ | Treasury Deposits ¹⁷ | Other Deposits ¹⁸ |
| Bankers Acceptances purchased ² | U.S. Government Bonds purchased outright ³ | Treasury Cash ¹⁹ | Other Deposits + Treasury Cash ²⁰ |
| Industrial Loans ³ | Gold & Gold Certificates ⁴ | Other Liabilities and Capital ²¹ | US Treasury supplementary financing account ²² |
| Other Assets ⁴ | Treasury Currency ⁵ | Reverse Repo ²³ | |
| Government Repos ⁶ | Agency Bonds purchased outright ⁷ | | |
| Special Depository Receipts (SDRs) ⁸ | MBS purchased outright ⁹ | | |
| Facilities created to address financial crisis (listed below) | | | |
| Term Auction Credit ¹³ | Term ABS Loan Facility ¹³ | | |
| CP Funding Facility ⁹ | Credit extended to AIG ¹⁴ | | |
| Maiden Lane ¹⁰ | ABCP money market funding ¹⁴ | | |
| Maiden Lane II ¹¹ | Primary dealer broker credit ¹⁵ | | |
| Maiden Lane III ¹² | Central Bank Liquidity Swaps | | |

1. While both advances and discounts are short term loans, since the 70s and until the recent credit crisis, most loans have been the former. According to Haskilly and Kletsky, advances are 2-bills to carry out, with the collateral for the loan staying at the member bank. 2-bills were originally purchased by the Fed to help foster the growth of a domestic acceptance market.
2. Loans authorized to industrial and commercial enterprises with maturities as long as 5 years under Section 13b of the Act.
3. Includes Rice, assets denominated in foreign currencies, accrued interest, land, and Reserve buildings. Due to delays in cheque processing, Rice's amount the Fed has yet to collect on checks received.
4. Assets of cash (U.S. 10, 20, 50, 100) which are minted by the US Treasury and bought by the Fed to be put into circulation. In the early days of the Fed, most treasury currency consisted of private bank notes and notes issued by the Fed.
5. Assets of temporary open market operations in which the Fed agrees to purchase and resell government securities.
6. Obligations of Fannie Mae, Freddie Mac, and Ginnie Mae.
7. Guaranteed by Fannie Mae, Freddie Mac, and Ginnie Mae.
8. The Fed lends money to the Commercial Paper Funding Facility (CPFF), which buys unsecured and asset-backed paper from the private sector.
9. Fed creates Maiden Lane, then lends it funds to purchase and manage the assets of a defunct Bear Stearns. Authorized under section 13.3.
10. Fed loans to Maiden Lane II fund purchases of residential mortgage-backed securities (RMBS) assets from AIG subsidiaries.
11. Fed loans to Maiden Lane III fund purchases of collateralized debt obligations (CDOs) on which AIG had written credit default swap contracts.
12. The Term Asset-Backed Securities Loan Facility (TALF) issues loans with a term of up to five years to holders of eligible asset-backed securities.
13. The Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) lends to non-member depository institutions with purchase ABCP from money market mutual funds.
14. The Primary Dealer Credit Facility (PDCF) lends overnight funds to primary dealers.
15. Member banks deposit with the Fed to comply with reserve requirements.
16. At the government's fiscal agent, the Fed has on deposit funds for the U.S. Treasury.
17. Deposits held at the Fed by foreign governments, non-member banks, and other. Also includes service related adjustments.
18. Currency held in the vaults of the U.S. Treasury.
19. Combined for convenience. This category for 1999-2009 only.
20. Includes capital paid in, surplus, and accrued dividends. Also the liabilities due to entities other than the FRBNY issued by the CPFF, the LLEs funded through the MMTF, and Maiden Lane I-III.
21. Funds raised by debt issued by the Treasury placed in this account, with the goal of offsetting the effects of the facilities created deal with the financial crisis.
22. Prior to Dec 2002, matched sales were used instead of reverse repos. They are fundamentally similar, but matched sales were deducted from outright purchases and therefore did not appear.
23. From 1939 to the early 50s, Fed did not hold acceptances, though it continued to post a buying rate until 1955. For simplicity's sake, this chart ends the market acceptance rate in 1936 and the Fed's acceptance rate in 1939. Acceptances bought after 1955 were at market rates.
24. Member banks faced different requirements. Until 1962, they were the Central Reserve City bank requirements. After 1962, rates are for largest bank category.
25. Federal Reserve Bank of New York rate. Prior to 1935, each Reserve Bank set its own rate.
26. New York rate in 1914-1916; advances in 1917-1918; New York rate in 1919-1921.
27. Rate on loans to members secured by short term government debt. In place from 1942-1946.
28. A modification of the discount rate, the primary credit rate is introduced in 2003 at a penalty above the federal funds rate.
29. Minimum buying rate in New York on 60-90 day acceptances.
30. New York rate. The 10b advance rate was merged with original discount rate (3) in 1980.
31. New York rate on advances to individuals, partnerships, and corporations secured by government obligations.
32. New York rate, low end of range, for industrial/commercial organizations.

Interest Rates, Risk Spreads, Reserve Requirements, and Inflation

- | | |
|---|---|
| Moody's Baa Corporate Bond Yield | Federal Reserve Rates |
| Stock Exchange Time Loans, 90 days | Original Discount Rate ¹ |
| Prime Commercial Paper Rate, 4-6 months | World War I Discount Rate Secured by Liberty Bonds ⁴ |
| Federal Funds Rate | World War II preferential discount rate ⁵ |
| Prime Banker's Acceptance rate ¹ | Primary Credit Rate ⁶ |
| Long-term Government Bond Yield | Banker's Acceptance buying rate ^{1,7} |
| Government 3 month T-bill Yield | Regular Advance Rate (Section 10b) ⁸ |
| Reserve Requirements ² | Advances authorized under Section 13.13 of Act ⁹ |
| Checking Accounts | Rates on Industrial Loans (Section 13b) ¹⁰ |
| Saving Accounts | Other |
| | Inflation rate-yearly |
| | Yield spread between Aaa Corporate and Long Term Government Bonds |
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Prior Experience of Federal Reserve Chairmen/Presidents

- | | |
|-----------------------|----------------|
| Banking | private sector |
| Law | Other |
| Other | Civil Service |
| Other Federal Reserve | public sector |
| Academia | |
| Star position | |
| Subsequent position | |

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