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**INSIGHTS FROM THE FEDERAL  
RESERVE'S WEEKLY BALANCE  
SHEET, 1914-1941**

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Johns Hopkins Institute for Applied Economics,  
Global Health, and Study of Business Enterprise



# **Insights from the Federal Reserve's Weekly Balance Sheet, 1914-1941**

**By Justin Chen and Andrew Gibson**

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## **About the Series**

The Studies in Applied Economics series is under the general direction of Professor Steve H. Hanke, co-director of the Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise ([hanke@jhu.edu](mailto:hanke@jhu.edu)). The authors are mainly students at The Johns Hopkins University in Baltimore. Some performed their work as research assistants at the Institute.

## **About the Authors**

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## **Abstract**

We present digitized data of the Federal Reserve System's weekly balance sheet from 1914-1941 for the first time. Following a brief account of the beginning era of the central bank, we analyze the composition and trends of Federal Reserve assets and liabilities, with particular emphasis on how they were affected by significant events such as World War I and the Great Depression.

## **Acknowledgements**

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**Keywords:** Assets, balance sheet, depression, Fed, Federal Reserve System, Great Depression, liabilities, recession, World War I

**JEL codes:** E51, E58, N22

## Introduction

Despite the Federal Reserve's status as the world's most influential central bank, its weekly balance sheet, a key data set for analyzing its policies, has apparently not previously been available in spreadsheet form for its early years. We make the balance sheet available in the spreadsheet workbook accompanying this paper. Readers very familiar with the Fed may wish to proceed directly to the graphs based on the balance sheet and the accompanying discussion, which start on page 12.

The Federal Reserve Act was signed into law on December 23, 1913, creating a central banking system for the United States consisting of twelve regional banks governed by a Federal Reserve Board (FRB). Prior to this, after the 1912 election, Democratic President-elect Woodrow Wilson had met with Carter Glass, a fellow Democrat who was to become the chairman of the House of Representatives Committee on Banking and Currency. They wanted to establish a central bank with a structure that would allay public concerns about control by Washington insiders or by a Wall Street cartel. These ideas of central banking were a response to the "Bankers' Panic" of 1907 and a disagreement with the central bank proposal of Republican Senator Nelson Aldrich. Eventually, Wilson proposed a compromise for a central bank with a federal structure. Interestingly, Congress only granted it a charter for twenty years initially, but the Federal Reserve became permanent with the passage of the McFadden Act of 1927.

The goals of the Federal Reserve Act were vague: the title mentioned furnishing an elastic currency and improving bank supervision, while the text directed the regional banks to set discount rates "with a view of accommodating commerce and business." In general, the act aimed to give the government power to address illiquidity and to maintain financial stability by providing control over the currency. Opponents to centralization cited the possibility of a monopoly only benefiting well-known bankers like J. P. Morgan. Proponents sought a lender of last resort, pointing to the success of the Bank of England in the previous fifty years. What really happened in the early Fed's years was much different than anyone envisaged.<sup>1</sup>



**Figure 1 – Official seals of the Fed and the Treasury, by 1935 the two remaining currency issuers in the U.S. monetary system**

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<sup>1</sup> For differing perspectives on the foundation of the Fed, see Lowenstein (2015) and Selgin (2016). Over the next several pages we rely heavily on Friedman and Schwartz (1963) and Meltzer (2003).

**Figure 2 – Chronology (notable financial crises and business cycle turning points in bold)**

<b>Date</b>	<b>Event</b>
Mid October 1907	<b>Panic of 1907</b>
November 20, 1910	Meeting at Jekyll Island, Georgia lays foundation for Fed
March 4, 1913	Democrat Woodrow Wilson becomes President
December 23, 1913	Federal Reserve Act charters Fed for 20 years
July 28, 1914	World War I begins as Austria-Hungary declares war on Serbia; brief worldwide financial crisis ensues, including in the United States
November 16, 1914	Federal Reserve Banks open for business
April 6, 1917	United States enters World War I
November 11, 1918	World War I ends
January 1920-July 1921	<b>Depression of 1920-21</b>
March 4, 1921	Republican Warren Harding becomes President
August 2, 1923	Harding dies, Vice President Calvin Coolidge becomes President
November 4, 1924	Coolidge wins election of 1924 amid economic boom
February 25, 1927	McFadden Act makes Federal Reserve's charter perpetual
March 4, 1929	Coolidge's Secretary of Commerce Herbert Hoover becomes President
October 29, 1929	<b>Wall Street "Black Tuesday" crash begins Great Depression</b>
November-December 1930	Bank panics in Tennessee and New York City
April-August 1931	Bank panics in Chicago and Toledo
September-October 1931	Bank panics in Chicago, Pittsburgh, and Philadelphia after Britain abandons the gold standard
January 22, 1932	Glass-Steagall Act of 1932 expands Fed's lending powers
March 4, 1933	Democrat Franklin Roosevelt becomes President; <b>bank panics since February</b>
March 6, 1933	<b>Roosevelt proclaims banking holiday</b> and effectively ends convertibility of dollar into gold for individuals; brisk recovery begins after banks reopen
March 9, 1933	Emergency Banking Act expands Fed's lending powers and presidential authority to regulate banking and financial transactions
April 20, 1933	Roosevelt proclamation formally suspends the gold standard
May 12, 1933	Agricultural Adjustment Act allows President to reduce gold content of dollar by up to 50 percent
June 5, 1933	Congressional resolution abrogates gold clauses in contracts
June 16, 1933	Glass-Steagall Act of 1933 creates Federal Open Market Committee, broadens Fed regulatory authority over federally chartered banks, and separates commercial and investment banking
Mid 1933-May 1935	Initially brisk recovery slows; picks up after National Industrial Recovery Act of 1933 expires on May 27, 1935
January 30, 1934	Gold Reserve Act of 1934 transfers ownership of Fed and other gold to the Treasury, devalues the dollar from \$20.67 per troy ounce of gold to \$35
August 1, 1935	Note issue by national banks in effect ends
August 23, 1935	Banking Act of 1935 gives more power within Fed to Board of Governors
November 3, 1936	Roosevelt wins election of 1936 in most lopsided vote in history
May 1937-June 1938	<b>Recession of 1937-38</b>
September 1, 1939	Germany invades Poland, beginning World War II
November 5, 1940	Roosevelt elected to unprecedented third presidential term
December 7, 1941	Japan attacks Pearl Harbor, United States enters World War II

*Sources:* Federal Reserve History Web site; National Bureau of Economic Research (recession dates).

*Note:* Presidential terms of office began on March 4 through 1933 and on January 20 thereafter.

The Federal Reserve System faced several problems during its initial development. Expectations for it were high but its anticipated activism was low. The very compromises that had enabled the passage of the act resurfaced and remained unresolved. The Federal Reserve Board in Washington and the twelve regional banks incessantly competed for control. No formal body existed to coordinate policy among the partly autonomous regional banks. Regional banks sometimes argued that Washington and the Board had too much influence over discount policy, while the Board responded with complaints such as that the regional banks leaked discount rate changes before they became official. Issues about the proper line of authority persisted until finally resolved in 1935 (see below). Benjamin Strong, president of the Federal Reserve Bank of New York (the most important regional bank), exerted great influence on Fed policy and frequently argued with prominent financial and political figures such as Adolph Miller and Carter Glass. Miller was one of the original Governors of the Fed, and Glass served as President Wilson's second Secretary of the Treasury, a position that at the time made him an *ex officio* member of the Federal Reserve Board.

All things considered, the legislative and political imperfections of the Fed should have been the least of its problems. World War I broke out shortly before the Fed began operations. Many countries either suspended or abandoned the gold standard to more easily finance expenses for ammunition and equipment for the war and costs of reconstruction afterwards. For smaller countries with less liquidity, maintaining gold reserves was too much of a restriction – fiat currency systems became the norm. Unlike many other countries, the United States remained on the gold standard. Foreign gold flowed in and inflation grew rampant while the Fed struggled to counter it. Simply put, the Fed's portfolio at the time was far too small to control the situation, and wartime necessities conflicted with price stability. Due to quantitative restrictions on member banks' ability to borrow from them, the Fed struggled to perform and devise activist strategies on its own (Wheelock in Federal Reserve History). The balance sheet data suggest that the Fed's capability to alter the economic course of the country was initially more limited than economists have often thought it to be.

Although it had tools to curb and prevent inflation with activist monetary policy, the Fed grew into a predominantly passive central bank reliant on revenues from member bank discounts and focused on interest rates, especially the discount rate. The "real bills doctrine" essentially gave monetary power to commercial banks – allowing them to spend freely provided it was deemed "productive," and providing them Fed credit in exchange only for short-term, self-liquidating loans that supposedly adapted passively to the natural flows of trade. The Fed still maintained the sole ability to change policy interest rates, but it was reluctant to do so because that might have been deemed too aggressive at such an early stage of its development.

The Fed did eventually overcome these problems and saw successes in the decade after the war. It presided as the overseer of the United States' gradual transition towards a unified currency. At its inception, the Fed introduced the Federal Reserve Note as legal tender – the only note that is still printed today. The following chart shows a convergence towards the now internationally popular fiat money system in which currency is no longer backed by precious metals.

**Figure 3 – Forms of currency and total value in circulation on June 30, various years (million \$)**

Currency Type	Issued by / Description	1914	1925	1936
<b>Federal Reserve Notes</b> 	<i>Federal Reserve System</i> Backed by whole Federal Reserve System. Only note still printed today.	0 (Fed not yet opened)	1636	4002
<b>Federal Reserve Bank Notes</b> 	<i>Federal Reserve Banks</i> Identical to National Bank Notes in function and value. Backed by individual Federal Reserve Banks.	0 (Fed not yet opened)	7	52
<b>United States Notes</b> 	<i>Treasury</i> Commonly known as “greenbacks.” Unbacked, includes Treasury notes of 1890.	340	284	279
<b>National Bank Notes</b> 	<i>National Banks</i> Also called “National Currency.” Backed by U.S. government bonds as collateral.	715	681	366*
<b>Gold Certificates</b> 	<i>Treasury</i> 100 percent backed by gold coins. Rescinded by Gold Reserve Act of 1933.	1026	1004	101*
<b>Silver Certificates</b> 	<i>Treasury</i> 100 percent backed by silver. Printed in small denominations in response to “Free Silver” movement.	479	383	954
<b>Gold coins</b> 	<i>Treasury (Mint)</i> Value as metal equaled value as coin. Demonetized in 1933.	612	402	0
<b>Silver coins</b> 	<i>Treasury (Mint)</i> Value as metal somewhat less than value as coin.	230	316	352
<b>Fractional coins</b> 	<i>Treasury (Mint)</i> Value as metal substantially less than value as coin.	57	100	135

\*In this year, many, possibly most, held as collector’s items or lost, not actually circulating.

Source: Anderson (2003: Table 1). There were also types of old currency that had gone out of circulation and hence are not listed here, such as Civil War-era notes for under \$1 and notes issued by state-chartered banks.

As Figure 3 shows, there were several different types of notes in circulation when the Federal Reserve was established in 1914. Because of that, the Fed's task became even more complicated. Not only did it have structural and fundamental problems, but it also had to deal with and eventually replace many of the distinct varieties of the money created long before its time. The idea of simplification was catalyzed by the monetary strife of Great Depression and ushered in a new era of U.S. money that ended where we are today, with only the Federal Reserve Note as paper money and the Fed as the issuer of almost all the monetary base. (The Treasury continues to issue coins, but they are only a tiny portion of the monetary base today.)

As evidenced by the problems of the Fed's early years, the U.S. monetary system was unwieldy. The Fed eventually overcame these developmental problems. A solid grasp of why it was created, how it operated, and what it initially served is necessary for a worthwhile analysis of monetary trends. By understanding the background of the Fed's development throughout the time periods, we are able to better comprehend the meaning behind the monetary policy surrounding the different economic downturns of the era.

## **Purpose**

This paper will use complete, weekly Federal Reserve balance sheet data to understand and analyze the division of assets between gold, other foreign assets, government bonds, and private-sector domestic assets to determine how they were affected by significant economic events such as World War I, the Great Depression, and the recession of 1937-1938 within the Depression. Understanding the initial wartime struggle of the Federal Reserve to become an active monetary entity and develop a proper policy framework, we start this paper analyzing the Fed's fundamental transition from a handmaiden of the Treasury in the early years to the more independent, activist body in the Roaring Twenties. The "Forgotten Depression" of 1920-21 highlights these concerns, and we will evaluate how the Fed addressed the transition in regards to the categories of its balance sheet. Moving on, we will delve into the unprecedented fall in stock of money during the Great Depression. After the trough of the Depression in 1933, we travel further in time to the recession within the Great Depression and examine how significant decisions by Congress and the Treasury on gold, silver, and banking forever changed the Fed and the U.S. monetary system. The Banking Act of 1935 and subsequent reorganization gave the Fed greater independence at least by law, but resulted in limited changes in policy actions. The Fed seemed less inclined to alter the discount rate or engage in open market operations. We analyze these balance sheets to see how policymakers reacted after the Great Depression and how they shaped the Fed for the upcoming World War II.

We divide our analysis into three periods: World War I and the postwar depression of 1920-21; boom and bust in the Roaring Twenties and the Great Depression; recovery from the Great Depression, the recession of 1937-1938, and the early years of World War II before the United States entered the war.

## **World War I and the “Forgotten” Postwar Depression (1914-1921)**

The beginning of the Federal Reserve was a financially tumultuous time for the United States. Austria-Hungary declared war on Serbia on July 28, 1914 and consequently war broke out in Europe just months before the official opening of the Federal Reserve. Stock exchanges in the United States and elsewhere suspended operations for a time, although no major bank failures occurred. President Wilson did not expect his plan to be put to the test so early, nor did any other supporters of Fed. When the United States officially entered the war in 1917, “trial by fire” began as the still-organizing Fed scrambled to allocate resources and manage finances for the impending war. Suddenly, war expenses began piling up and put pressure on the government to utilize the new central banking system in a time of crisis. The Fed was put to use, but the war made it difficult for the Fed to become independent. As a result, it was not as active as the original drafters had envisioned. Instead, it focused its powers on running government bond, or “Liberty Loan,” drives to help finance the war and manage debt. In addition, it sought to create positive incentives for smaller banks to purchase Treasury certificates (short-term loans to the Treasury). Even though the original plan may have gone off course, the Fed’s de facto coalition with the Treasury was largely a success in terms of war finance. By 1918, the Fed and Treasury were already able to sell a combined total of around \$10 billion in bonds and Treasury certificates, equal to about 13 percent of GNP. By raising and lowering interest rates for lending to other banks, the Fed effectively relaxed credit conditions and stimulated short-term growth in the domestic economy. This method of altering the discount rate defined the early legacy of the Federal Reserve. World War I “reshaped the Federal Reserve System in many ways,” states Allan Meltzer (2003: 84) in his authoritative *History of the Federal Reserve*. He is right: the financial burdens of the war and pressure from legislators forced the young Fed to be fully beholden to the Treasury.

In the early postwar months, the Fed faced a daunting task: to diminish its wartime financial role and provide a smooth economic transition back to regular monetary operations. The Fed needed to promote its own identity and resist fiscal pressures because “independence [during the war] was sacrificed to maintain interest rates that lowered the Treasury’s cost of debt finance” (Meltzer 2003: 85). Surprisingly, the United States fared very well economically: domestic sales and exports alike skyrocketed. War-ravaged countries in Europe began to purchase enormous amounts of goods from the United States to aid reconstruction, resulting in increasing gold holdings at the Federal Reserve. The boom was a “pleasant anomaly,” as historical experience would typically have suggested depression after war (Grant 2014: 11). But while gold inflows increased significantly during the war, postwar data indicate a tapering of net flows into the Fed.

Postwar prosperity was soon interrupted, however. Monetary experimentation, purposefully minimal government intervention and poor bank regulation eventually led to a depression in 1920 colloquially named the “Forgotten Depression.” Reversing part of the previous inflation, the price level fell in response to the Fed raising the discount rate. The expansion that had come with the gold inflow seemed to finally come to an end. With the government coasting through the final year of President Wilson’s term and distracted with attempts to achieve global



peace and the creation of the League of Nations, the depression was largely ignored by government policy – resulting in a laissez-faire approach that included standing firm by the gold standard and allowing the market to rid itself of financial hardship on its own. And as the popular and charismatic Republican President Warren G. Harding entered office in the midst of the downturn, policy stayed on its same course, as Harding’s pro-business mentality led to what today would seem a passive, even apathetic government policy. Harding campaigned promising a “return to normalcy,” and in economic policy he delivered. The postwar boom ended, and after a year and a half of recession the economy “naturally” stabilized and began to expand.

Total Fed assets hovered around \$5 billion for most of the 1920s. A substantial gold reserve of roughly \$3 billion gave the Fed flexibility to convert more of its assets into government securities and trade those securities on the market. Now with a larger portfolio of securities, the Fed in the 1920s was finally able to implement the monetary policy expected of it at its inception. Countries in Europe did not fare as well. Exorbitant war expenditures led to the instability of several European currencies as the U.S. dollar began to internationalize as a preferred medium of exchange abroad.

The significance of the depression regarding the Federal Reserve is that the Fed did so little. It refused to lower interest rates in wake of the price plunge. What followed was a rapid accumulation of negative economic signs: “a decline of 23.9 percent in nominal terms, 8.7 percent [deflation]...producer prices fell by 40.8 percent, industrial production by 31.6 percent, stock prices by 46.6 percent and corporate profits by 92 percent” (Grant 2014: 5).

### **The Roaring Twenties and the Great Depression (1922-1933)**

Following the sharp but not lengthy depression of 1920-1921 was a dynamic expansion powered by increasing confidence from consumers in the aftermath of the war and, a number of economists have argued, by the Fed’s monetary policy. American cities were changed forever by the progress of the automobile industry and an immense prosperity in the construction industry, attracting rural Americans with hopes of a better life in an expanding industrial sector. By the mid 1920s, after the Fed’s tumultuous beginnings during World War I, many of the original hopes for it were met: interest rates were relatively stable, recessions were brief, rare and with subsequent rapid recovery, and gold reserves had risen from \$500 million in April 1917 to \$3.1 billion in April 1924.

On February 25, 1927, President Calvin Coolidge signed the McFadden Act into law. It introduced a new structure of the commercial banks regulated under the Federal Reserve System. Regional banks of the Federal Reserve each used to operate out of a lone building, but with the Act allowed them to expand locations and powers. The size and type of the loans the regional banks could make increased, supported by the argument that the economy was booming, and the old rules that were in play were too conservative with investing (Meltzer 2003: 217). The year 1929 saw few changes to monetary policy as a result of the dispute between the Federal Reserve Board and the Federal Reserve Bank of New York over the ability of regional banks to discriminate against loans. Power ended up shifting from the New York Fed

to the Board, and the Great Depression began in 1929 after the stock market crashed. The commercial banking system nearly collapsed, and money stock declined with resulting unparalleled consequences as the Federal Reserve System failed to avert the monetary collapse.

The Great Depression from 1929-1933 was the greatest economic contraction in the history of the United States. Its impact spread across the globe and it lasted up a decade in particularly hard-hit countries, only truly ending with the outbreak of World War II. The Yale University economist Irving Fisher famously proclaimed in early October of 1929 that “stock prices have reached what looks like a permanently high plateau,” falsely believing that the market would only keep going up after almost a decade of growth. In August 1929, the economic expansion of the Roaring Twenties slowed. Share prices peaked in early September, with the official end coming on October 29, notorious as Black Tuesday. Standard and Poor’s composite price index, which consisted of 90 common stocks at the time, fell to 162 after having peaked at 254 on September 7. More than 20 percent of the commercial banks in the United States, which held almost 10 percent of bank deposits at the start of the Depression, had to suspend their activity due to the financial crisis. Money income “declined by 15 percent from 1929 to 1930, 20 percent the next year, and 27 percent in the next, and then by a further 5 percent from 1932-1933” (Friedman and Schwartz 1963: 301). Prices fell too, but not enough to counteract precipitously declining income.

### **Recovery, Recession, and the Beginnings of World War II (1933-1941)**

The Banking Act of 1932 aimed “to improve the facilities of the Federal reserve system for the service of commerce, industry, and agriculture, to provide means for meeting the needs of member banks in exceptional circumstances.” It reinforced the Federal Reserve’s mandate as a lender of last resort during periods of financial crises. The act is also known as the first Glass-Steagall Act after its sponsors Carter Glass, who was by this time a senator from Virginia, and Henry Steagall, a Democratic congressman from Alabama.

The Reconstruction Finance Corporation Act, signed by President Herbert Hoover on February 27, 1932, was designed “to provide emergency financing facilities for financial institutions, to aid in financing agriculture, commerce, and industry.” Originally designed to manage the finances of struggling financial institutions, business corporations, and railroads, the Reconstruction Finance Corporation did not play a big role in Hoover’s administration. However, it was much used during the New Deal under Franklin Roosevelt’s administration.

Several waves of local or regional bank runs occurred during the Hoover administration. They culminated in a nationwide run at the end of Hoover’s presidency, only days before his rival and successor Franklin Roosevelt was to be inaugurated. Many people felt that it was not safe to hold their money in banks, and continued to withdraw funds from the banks and keep their money under their beds. Roosevelt immediately took action not even a full two days after inauguration, announcing over his first fireside chat that he was implementing a nationwide banking holiday. During the holiday, which lasted from March 6 to March 9, 1933, Roosevelt

ordered a cessation of any transactions involving the withdrawal of gold, silver, bullion, or currency, and declared that all banks including those within the Federal Reserve must not “pay out deposits, make loans or discounts, deal in foreign exchange, transfer credits from the United States to any place abroad, or transact any other banking business whatsoever.” This action was followed by the Emergency Banking Act of 1933, which required banks to be examined thoroughly before they could restart their operations. The act had these major provisions:

Title I: Delegated broad powers to the President of the United States to regulate all currency and banking, and temporarily forbade withdrawal of any deposits made by any member of the banking systems. The nationwide bank holiday from March 6-9 was also confirmed within this section.

Title II: Only national banks with solid assets were allowed to reopen and operate after approval and examination by the Comptroller of the Currency.

Title III: Preferred stock could be sold by national banks to citizens or the Reconstruction Finance Corporation.

Title IV: Federal Reserve emergency bank notes could be issued and credited as security, up to face value of direct liabilities of the United States government. After the banking holiday emergency was over, these notes could only be distributed on the security of such liabilities.

Title V: Gave the power to Federal Reserve Banks to make advances under extreme financial crises to member banks on their own notes on the security of authorized assets until March 3, 1934, which was later extended.

Defined as a “most constructive step toward the solution of the financial and banking difficulties” by Secretary of the Treasury William Woodin on March 9, 1933, the Emergency Banking Act of 1933 in fact did much to restore confidence in the Federal Reserve and the banking system. Roosevelt felt that “it is in the best interests of all bank depositors that a period of respite be provided with a view to preventing further hoarding of coin, bullion or currency or speculation in foreign exchange and permitting the application of appropriate measures to protect the interests of our people.” With the passage of this act, the authority of the President of the United States during times of financial crisis was increased, as he could oversee all banking operations, including “any transactions in foreign exchange, transfers of credit between or payments by banking institutions as defined by the President, and export, hoarding, melting, or earmarking of gold or silver coin.” The Emergency Banking Act also gave the Federal Reserve the option to issue emergency currency in the form of Federal Reserve Bank Notes, which were financed by all types of assets that commercial banks held. Previously the rules for issuing notes had been more restrictive.

The Roosevelt administration’s controversial policies concerning gold stanching the outflow of gold from the Federal Reserve’s stock. Many Americans preferred gold coins and bullion to paper money during the financial crisis of 1933. Fears that the dollar might be devalued led to an external drain on the Fed’s gold stock by foreigners. Roosevelt’s gold policy restricted the domestic private use of gold and limited gold outflows to foreigners. The gold standard was suspended after Roosevelt proclaimed that the Treasury could no longer convert currency to

gold or export gold. Next, the administration devalued the dollar by sanctioning the Reconstruction Finance Corporation to purchase gold at increasing dollar prices. This was aimed at not only raising the value of gold, but prices of U.S. products as well. The economy began a vigorous recovery, whose pace slowed after certain New Deal regulatory policies began.

In the aftermath of the 1929 stock market crash and the Great Depression there was much concern over the use of bank credit for speculation instead of for industrial and commercial growth. Sen. Carter Glass and Rep. Henry Steagall sponsored a new measure called the Banking Act of 1933 (the second, and better known, Glass-Steagall Act). There was little opposition to most provisions of the bill, which revised the banking system through the separation of commercial banking and investment banking, regulation of national banks by the Federal Reserve System, and the creation of the Federal Open Market Committee. However, the bill's creation of the Federal Deposit Insurance Corporation (FDIC) stirred controversy among the bigger banks, who feared they would be obligated to fund smaller, rural banks. Even so, the bill became law.

The Gold Reserve Act of 1934, signed on January 30, transferred possession and ownership of all United States monetary gold to the U.S. Treasury in exchange for currency at \$35 per troy ounce of gold, a substantial devaluation from the previous rate of \$20.67. The Fed therefore no longer owned its gold reserves outright; rather, it owned a claim to gold held by the Treasury, shifting some power away from the Fed. Other sections of the act deemed it illegal for the Treasury to exchange dollars for gold and forbade coins as a use for monetary gold, which now had to be in the form of gold bars. Roosevelt aimed to "stabilize domestic prices and to protect the foreign commerce against the adverse effect of depreciated foreign currencies."

The post-1933 recovery went off the rails in the recession of 1937-1938, which was unexpectedly severe. Milton Friedman and Anna Schwartz (1963: 544) blame it on Federal Reserve and Treasury policies that created a contraction in the money supply. Excess reserves swelled in volume and banks feared of a repeat of the 1929-1933 depression, while the Fed, fearing inflation, almost doubled reserve requirements to shrink "excess" reserves. The recovery from the recession was swift but not without challenges for policymakers. Output grew by almost 50 percent. From January 1936 to December 1937, gold rushed in from overseas, increasing by nearly 22 percent. These inflows were induced by the restrictions on individual holdings of gold, which made the dollar undervalued in terms of gold. Fear of impending war in Europe was another factor in capital inflows to the United States. The period this paper reviews ends with the U.S. entrance into World War II.

## **Data and Discussion**

A number of insights can be gained from fairly simple graphs comparing and analyzing various significant line items of the weekly balance sheet data.

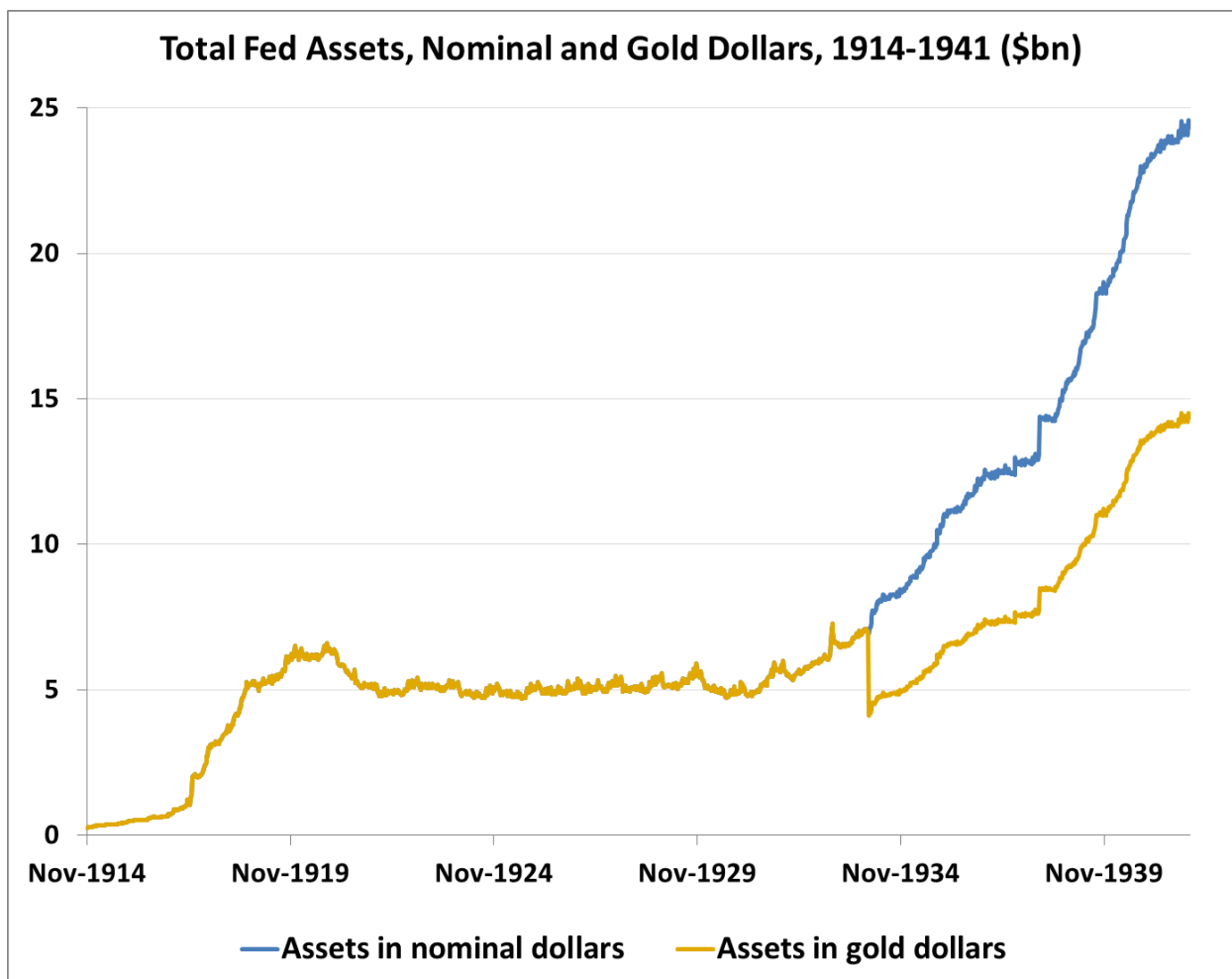


Figure 4

### Total Assets

The United States entered World War I in April 1917. Federal Reserve assets more than quintupled during the war and continued to rise afterwards, reaching a high of \$6.6 billion in October 1920 despite a discount rate of 7 percent. Assets then gradually settled back down to around \$5 billion by August 1921 and remained around that level all the way through the Roaring Twenties and the first part of the Great Depression, through August 1931. After August 1931, assets again rose, and continued to rise rapidly for the remainder of the period through 1941.

Figure 4 depicts total assets of the Federal Reserve System both in gold and nominal dollars, after the introduction of a new form of gold standard in February 1934. As has been mentioned, gold was devalued to \$35 per troy as opposed to the previous rate of \$20.67 set by the Gold Act of 1900. No matter which measure one uses, assets continued to grow at double-digit rates until 1941, when they slowed to high and later mid-single digits.

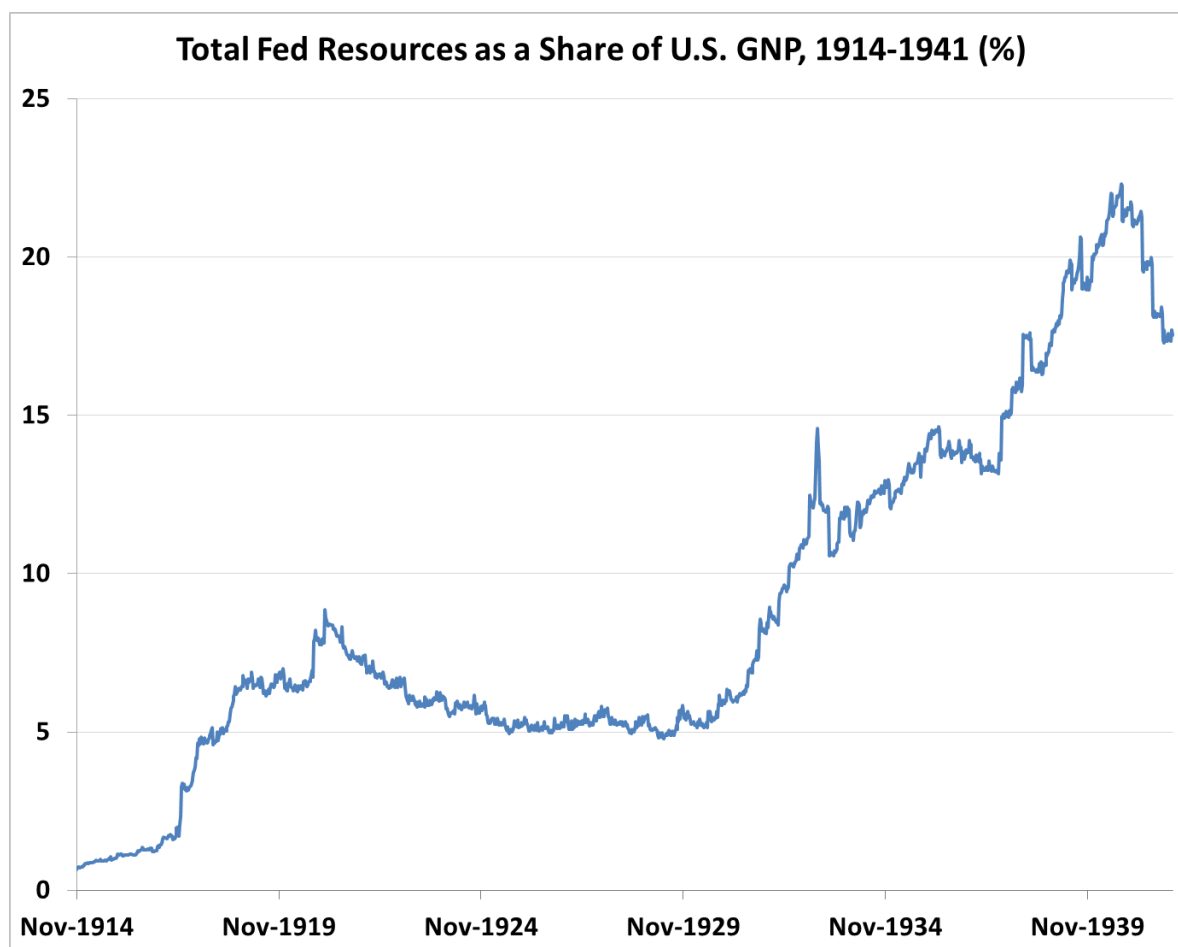
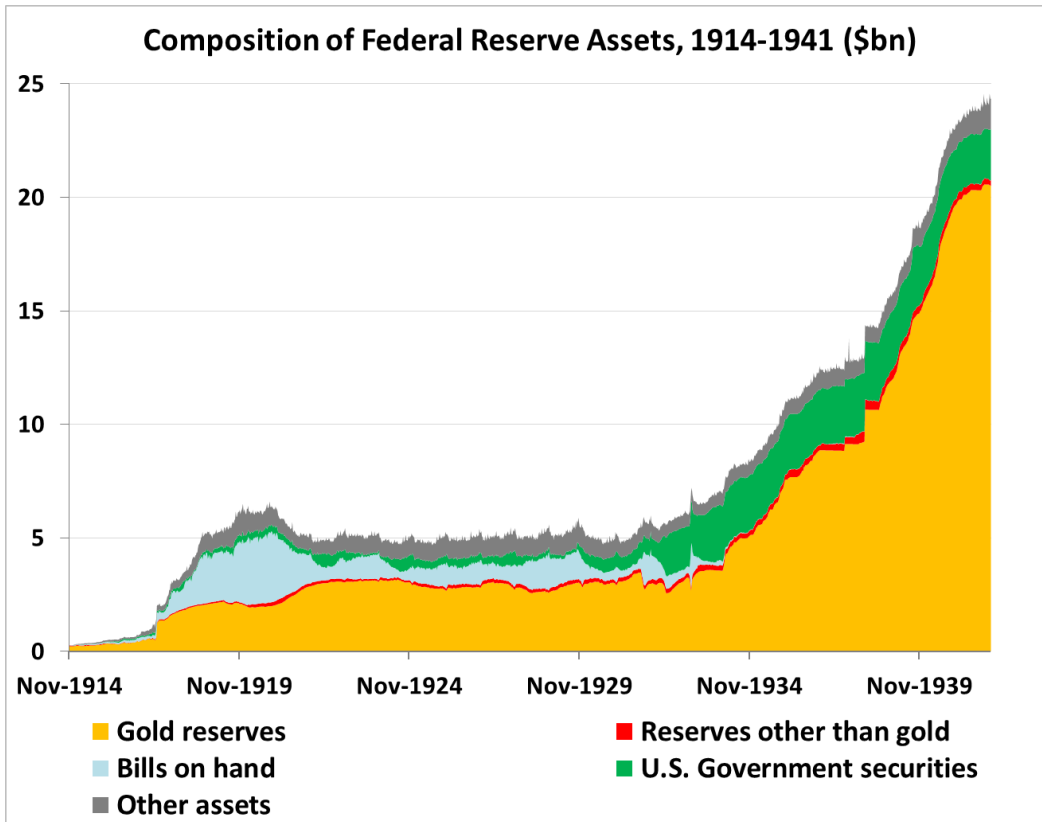


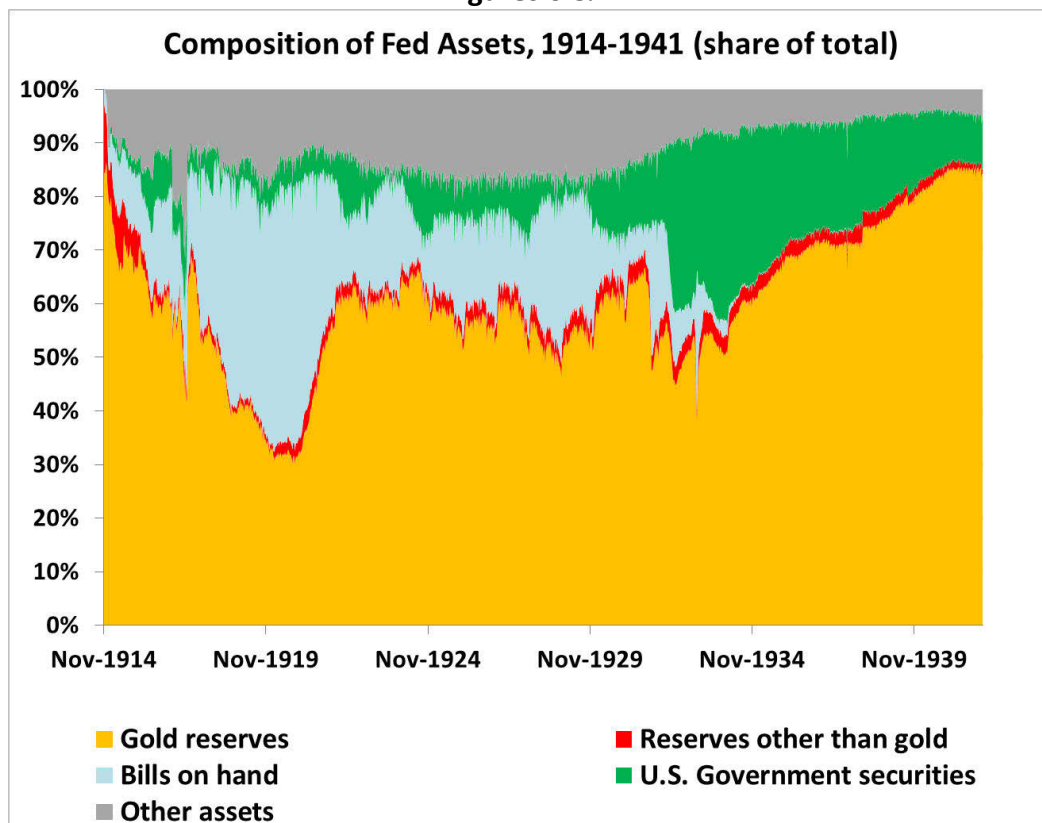
Figure 5

### Total Fed Resources/GNP

Pre-World War I numbers showed a gradual increase in total Federal Reserve resources (assets) as a share of Gross National Product (GNP). A sharp ascent occurred when the United States entered the war. The percentage continued to climb until peaking at 8.8 percent in January 1921. The depression of 1920-1921 saw a sharp fall in production and prices. U.S. GNP by the end of the third quarter of 1921 had fallen to \$69.35 billion, versus \$95.98 billion in the first quarter of 1920. Nominal Fed assets and the ratio of assets to GNP fell. The mid 1920s produced a stable nominal GNP, which hovered around \$95 billion until 1928, then gradually increased until the Great Depression. (In real terms the economy grew in the mid 1920s.) U.S. nominal GNP shrank dramatically during the Depression, dipping to \$49.78 billion in the first quarter of 1933 after hitting \$106.72 billion in the third quarter of 1929. It took more than ten years for U.S. nominal GNP to reach these levels again. Real GNP recovered a little faster (NBER, Tables for "The American Business Cycle"). Fed resources as a share of GNP rose from about 5.5 percent to 14.6 percent through the Depression. In the years leading up to World War II, it is interesting that nominal GNP grew much faster than Fed assets, and the ratio declined from about 22 percent in late June 1940 to 17.5 percent in late 1941.



Figures 6 & 7



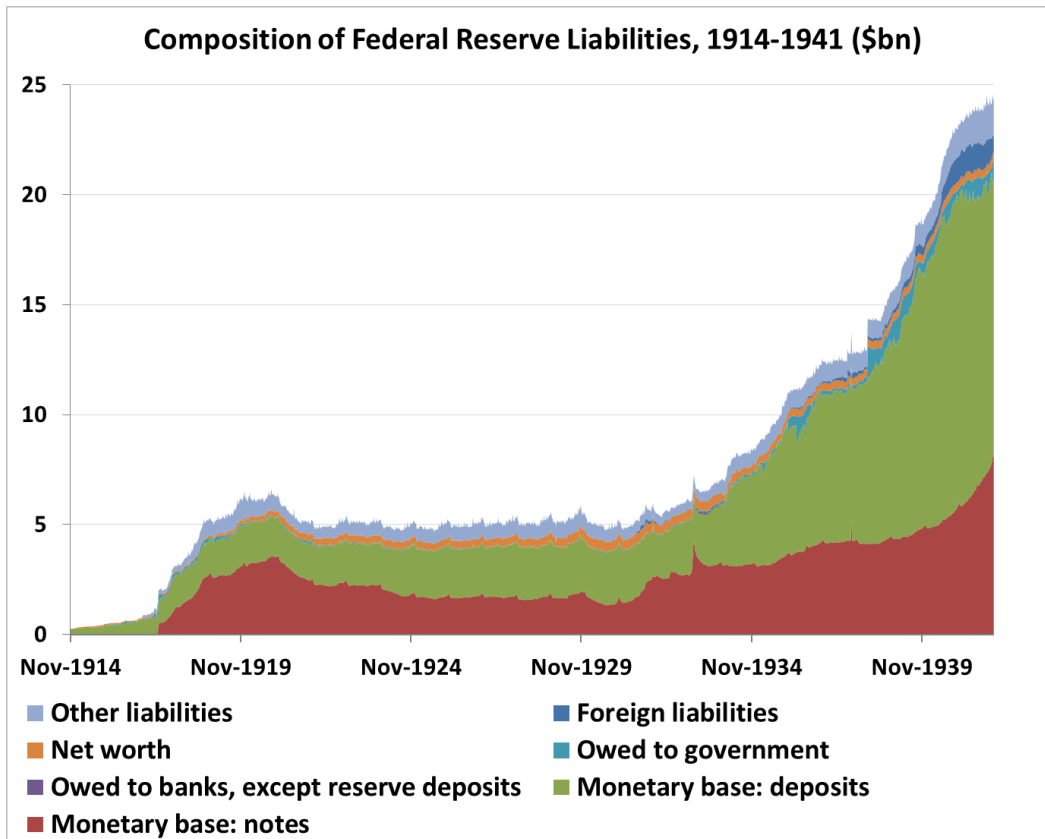
### **Asset Composition (graphs on previous page)**

Total gold reserves made up almost 84 percent of assets when the Fed opened in November 1914, declining to less than 40 percent in 1918 as the Fed's total bills on hand, reserves other than gold, and total U.S. government securities increased. An interesting fact is that even while gold rose throughout the war, bills discounted rose much faster, quadrupling from 10.3 percent of total assets when the United States entered the war to 42.6 percent three days before the war ended. The Fed could have refused to discount bills and only let the monetary base expand as its gold reserves expanded. A month after the United States entered World War I, the percentage of total gold reserves briefly to 68.9 percent of assets before falling again. Postwar data show a steady climb in total gold reserves until the end of January 1922, when they settled at around 60 percent of total assets up until the Great Depression. Around November 1929 and again around April 1932, U.S. government securities increased sharply, rising to 30 percent of total assets at the end of 1934 before beginning a continual decline until the end of 1941. Bills on hand, significant until then, shrank to nearly nothing. In the 1930s, interest rates were too low to entice banks to buy large amounts of securities and thus banks held large amounts of reserves. The expansion of the reserve base did not lead to a sufficient increase in the money stock as intended. As Friedman and Schwartz (1963: 205-209) remarked, when banks found out that the Federal Reserve would not provide them with adequate reserves during the times of crisis, they believed they would have to hold a larger amount of excess reserves for precautionary reasons against runs or currency demands. Thus, reserves continually rose until the end of our period of focus.

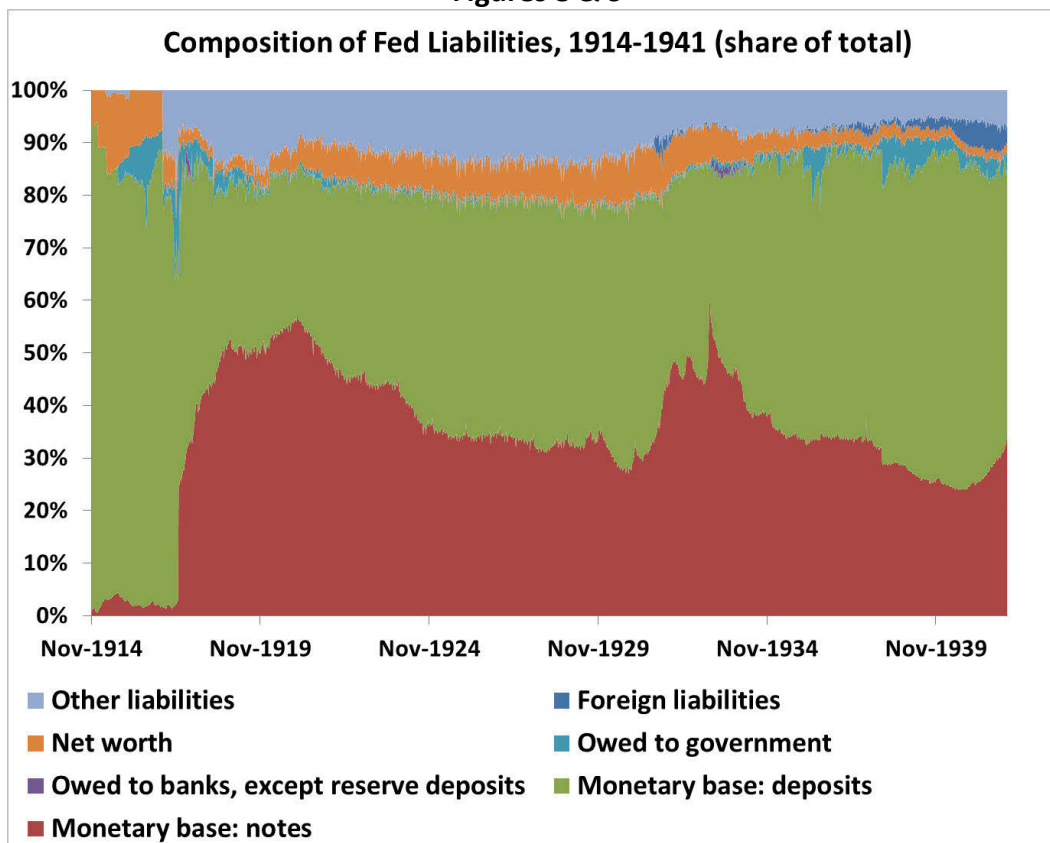
### **Liability Composition (graphs on next page)**

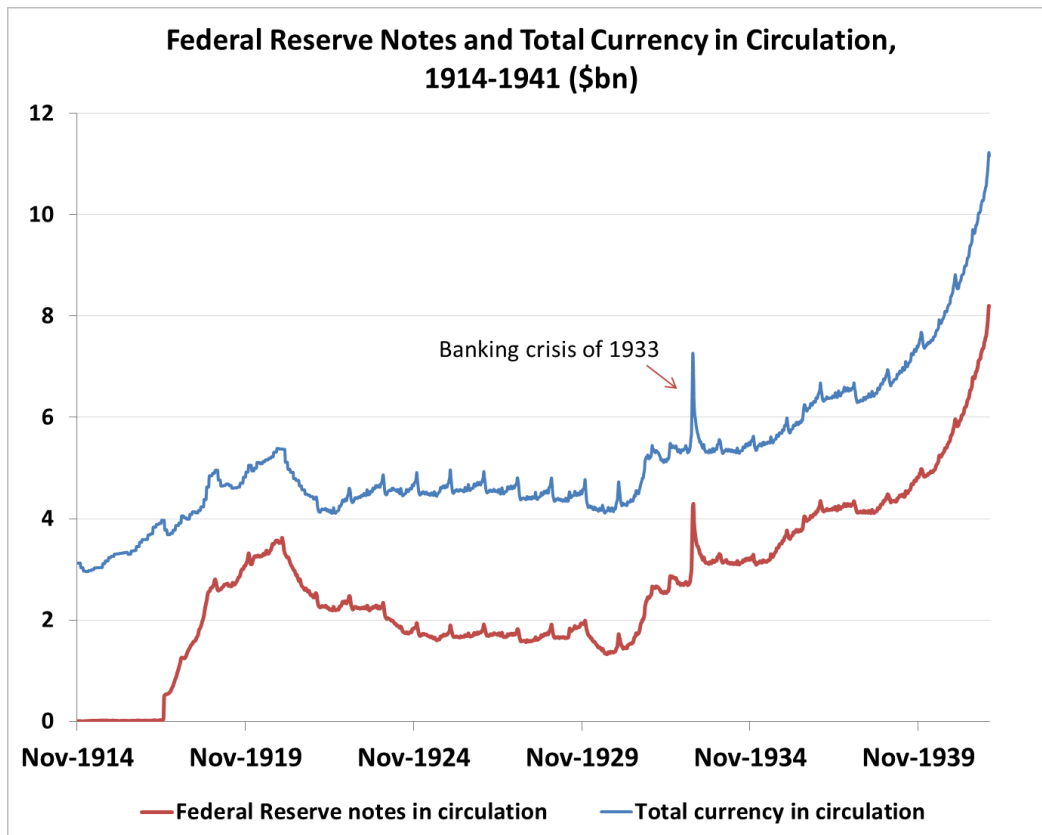
The Federal Reserve liabilities are mostly composed of the monetary base throughout our period of focus. Shortly after entering World War I, the Fed experienced a tremendous increase in notes in circulation, from \$43.3 million to \$500.5 million (equivalent to approximately 22 percent of the share of total liabilities). The explanation is that on June 21, 1917, an amendment to the Federal Reserve Act gave regional banks more freedom in the amount and nature of their loans, subsequently resulting in a 21 percent increase in the monetary base. The effect of the legislation was to increase excess gold held by Federal Reserve banks by \$300 million. In addition, the Act amended Section 13 of the Federal Reserve Act, which authorized non-member banks to clear checks deposited through their district's Federal Reserve bank. After the postwar depression, notes as a share of the Fed liabilities hovered between 44-46 percent until the end of 1923, then decreased to around 34 percent by mid-1925 and remained at that level for several years. Once the Great Depression materialized, deposits began to increase and became the largest liability item briefly around fall 1930, while notes decreased and hit a trough of 26.8 percent in October 1930. As the Depression persisted, there was a spike in the share of notes because of growing distrust in the solvency of banks. Many Americans preferred to keep their cash at home. From March 1933 to March 1934, deposits at the Fed doubled from \$1.7 billion to \$3.4 billion as depression gave way to expansion. In the aftermath of the Depression, the monetary base as a share of total liabilities remained at about the same level, fluctuating between 84-86 percent.



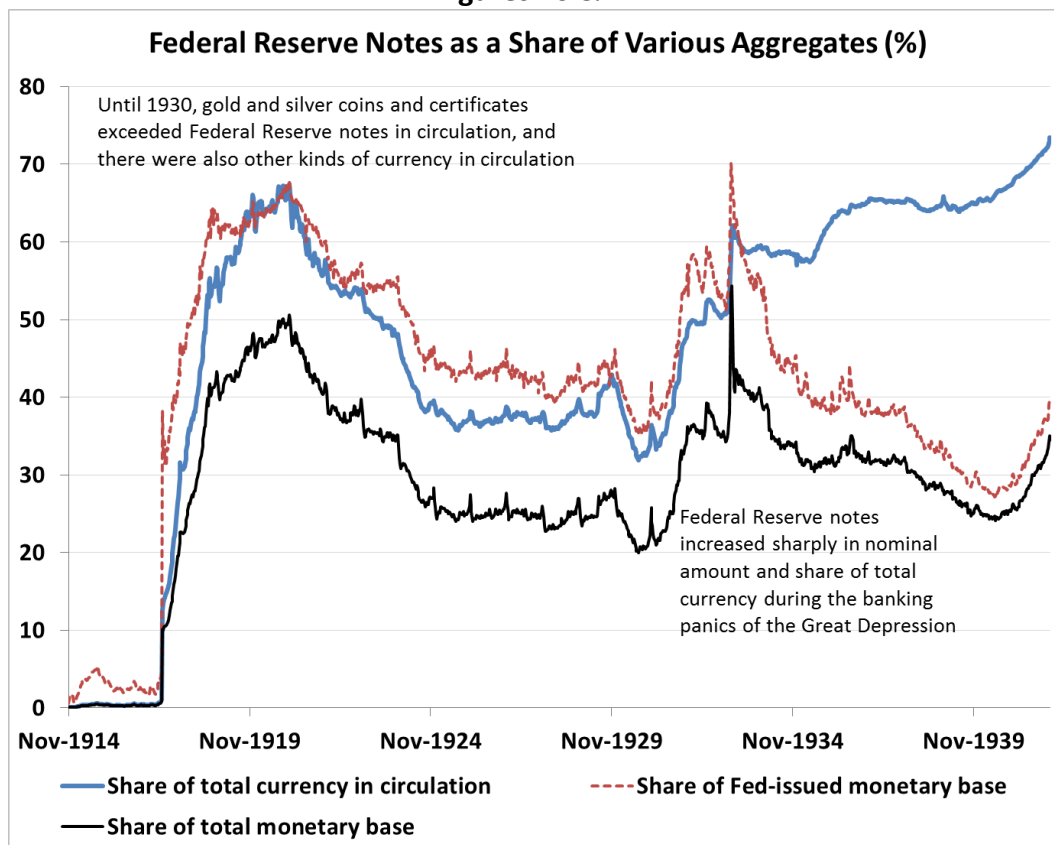


Figures 8 & 9





Figures 10 & 11



## **The Status of Federal Reserve Notes in the Monetary System (graphs on previous page)**

Federal Reserve notes and total money in circulation generally followed the same trend, as the first graph on the previous page shows. Both increased during and for a while after World War I, remained roughly constant through the Roaring Twenties, and rose during the Great Depression and afterwards until the end of our coverage, in 1941. There is a significant blip towards the beginning of the consistent rise, which can be explained by the banking crisis of 1933. Right after World War I, total currency in circulation hovered around \$5.5 billion, but declined during the “Forgotten Depression” following the war. By the end of 1921 currency had fallen by over \$1 billion. Discounting minor seasonal fluctuations (notably the little rises each December for year-end payments and Christmas shopping), currency in circulation remained close to \$4.5 billion until mid 1931.

After June 1917, Federal Reserve notes surged from just \$43.3 million to an astounding \$500.5 million for reasons explained above related to changes in the law about conditions for issuing the notes. World War I produced rapid growth of Federal Reserve money. Nearly 70 percent of high-powered money at the time consisted of Federal Reserve notes or Federal Reserve deposits. During the Roaring Twenties, total currency in circulation fluctuated within a narrow plateau of \$4.5 billion to \$4.7 billion, but the ratio of deposits at the Fed to currency quickly increased during the expansion after the depression of 1920-21 until 1923, and again rose in 1927. The activity of the share of total currency in circulation before, during, and after the Depression was not as stable and permanent as the seasonal movements in currency that were on display throughout the twenties. This percentage dwindled to about 39 percent in 1928 before the Depression hit, then slowly increased to 46.6 percent in December 1929 before plummeting to 35.4 percent in August 1930. Post-Depression, the Fed’s share of total currency in circulation rose steadily even though the Treasury began issuing a growing amount of silver certificates. The bonds that banks were required to hold to be able to issue national bank notes ceased to be outstanding. National bank notes, which comprised about one-eighth of the currency, therefore started to be retired from circulation in 1935, and the paper currency in the United States was consolidated into Federal Reserve notes, United States notes (greenbacks), and silver certificates.

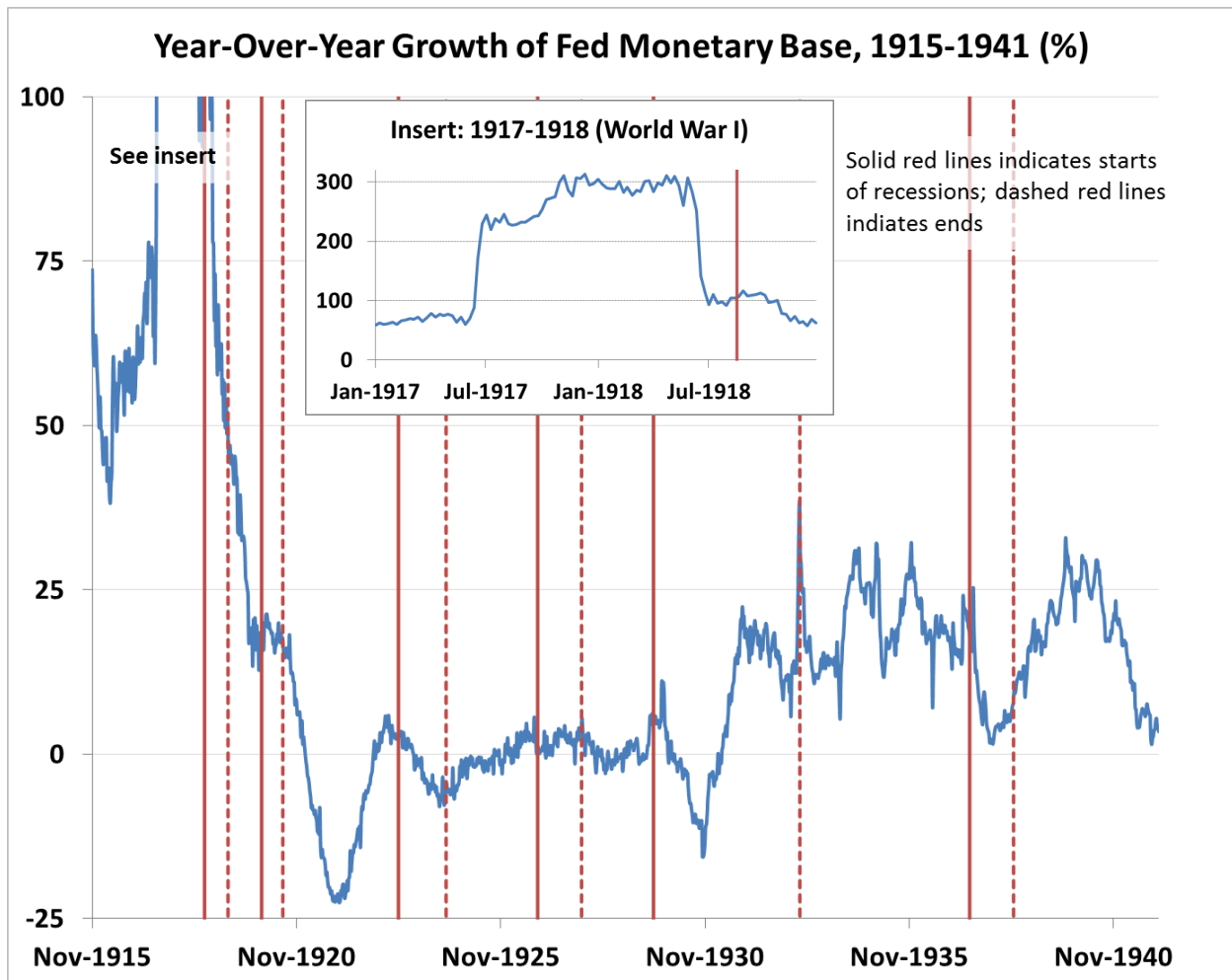
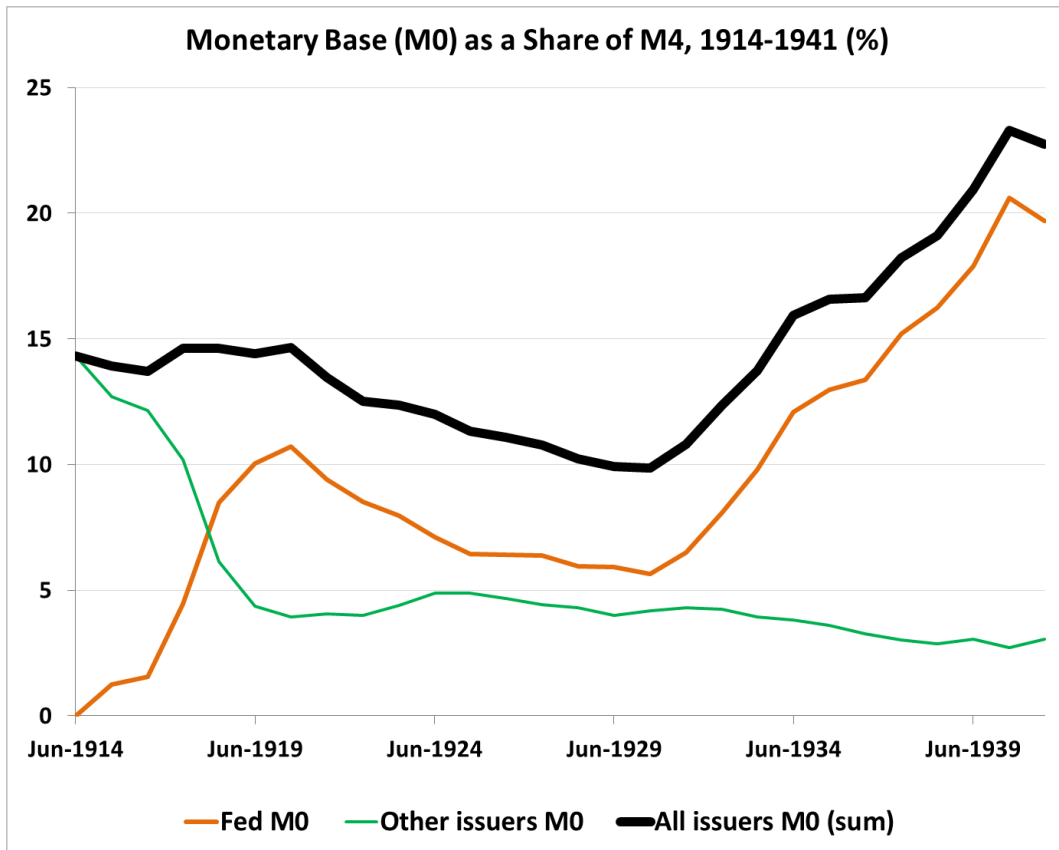


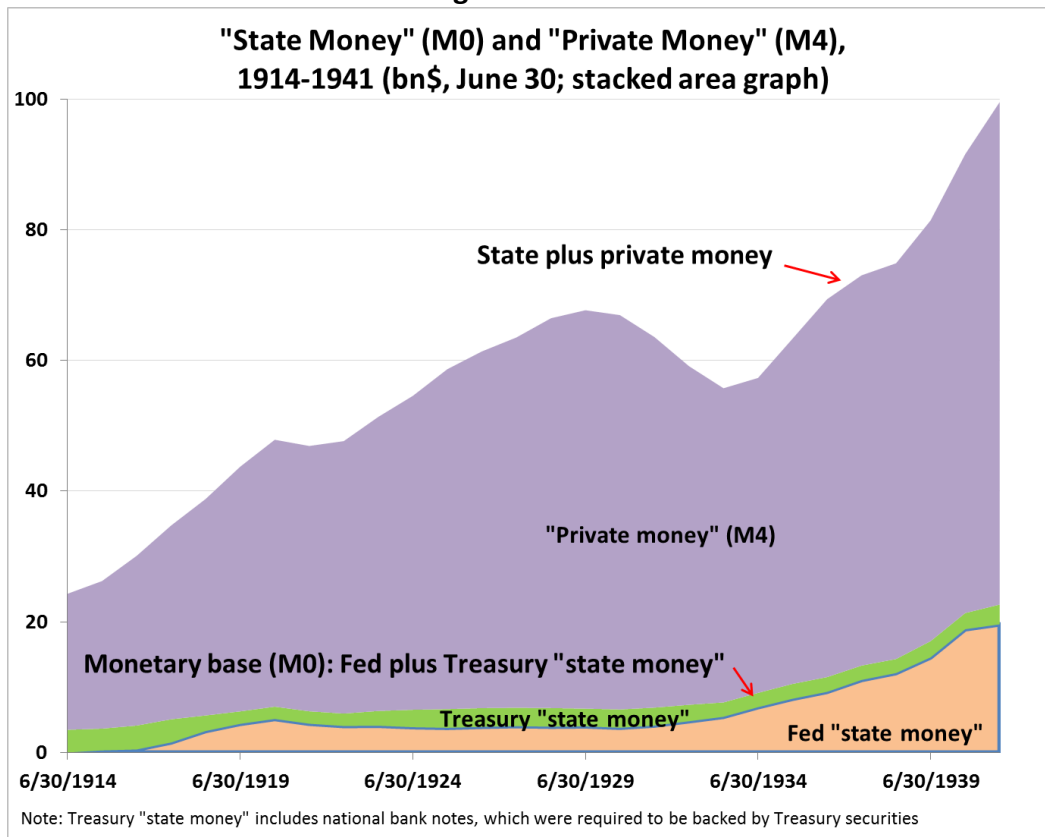
Figure 12

### Growth Rate of the Federal Reserve-Issued Monetary Base

Around June 1917, the Federal Reserve-issued portion of monetary base skyrocketed along with total gold reserve assets, as year-over-year growth more than tripled, reaching a peak point of an incredible 311 percent. According to the Fed's 1917 annual report (p. 11), issuing notes was made simpler by allowing their distribution against gold as a security, "being permitted to be counted as a part of the required gold reserve against notes...have thus been greatly augmented." However, as World War I drew near a close, growth in the monetary base rapidly declined as the Allies approached victory over the Central Powers, returning year-over-year growth to around 20 percent. When the postwar recession hit in 1920, the Fed-issued monetary base sank into contraction, reaching a trough of -22 percent at the end of 1921. The rest of the Roaring Twenties brought year-over-year growth around zero, but again turning negative as the Great Depression hit from early 1930 until spring 1931. After rising to low double-digit levels in the early 1930s, growth was brought back down by the recession of 1937-1938 to near zero in the autumn of 1937, but rose again and remained just above zero for the remainder of our period of focus.



Figures 13 & 14



## State Money and Private Money (graphs on previous page)

The graphs above track the ratio of “private money” (M4) to “state money” (M0), which we will refer to as a gearing ratio, throughout the significant events that occurred during our period of focus. (See Hanke [2016] on the importance of these concepts, which date back to John Maynard Keynes.) This gearing ratio began at about 6:1 when the Federal Reserve was first established, and slowly rose until it peaked at about 9:1 in 1929 before the Great Depression. The gearing ratio rapidly declined during this period of economic turmoil, as Federal Reserve deposits in state money fell by over \$400 million from June 1931 to June 1932, and private money plunged from \$56.7 billion to \$51.8 billion within the same period. As both M4 and M0 increased during the recovery years and on, the gearing ratio slid and rested at 3:1 by the end of 1941.

World War I was a significant factor in the jump in Fed-issued M0, from approximately \$468.6 million in June 1916 to over \$1.5 billion in June 1917. The upward trend continued as Federal Reserve notes and deposits doubled the subsequent year to over \$3.2 billion in June 1918. Apart from the depression of 1920-21, noticeable by a short-lived flattening of the purple area in Figure 14, private money increased every year from the establishment of the Fed, by relatively large amounts, until the onset of the Great Depression – upwards of \$2 billion nearly every year. However, both total state money and private money began to plummet in 1929. The Depression took a massive toll on private money: in the four years from June 1929 to June 1933, M4 fell from \$60.9 billion to just \$48 billion. The gearing ratio of M4 to M0 fell from around 9:1 in 1920 to 4:1 during the Great Depression. Total Fed-issued M0 increased from \$3.7 billion to \$5.4 billion between 1930 and 1933, partially accounting for the drop in the gearing ratio. From August 1929 to March 1933, the stock of money fell by one-quarter because of widespread bank failures. Both state money and private money then consistently increased until the end of period in 1941.

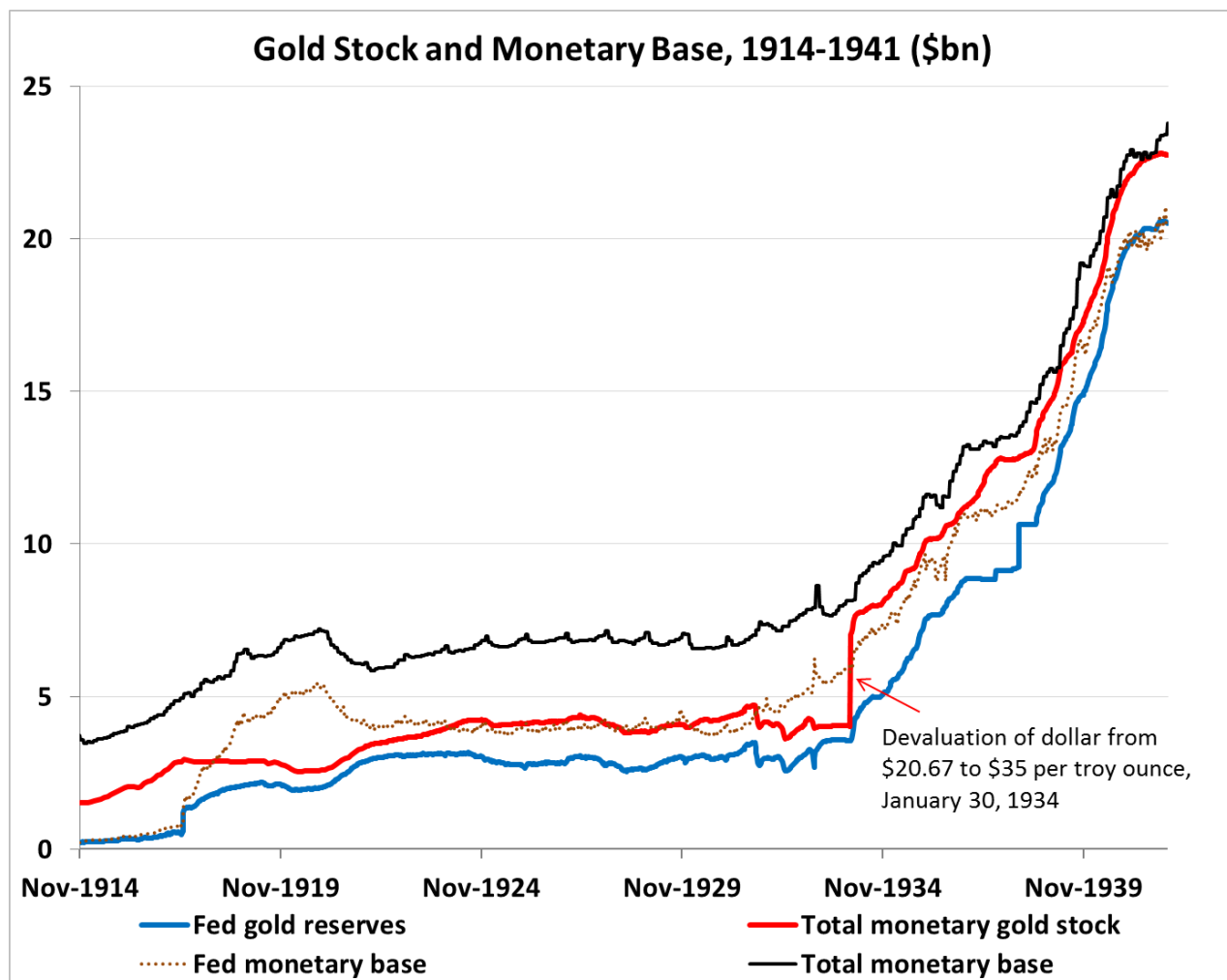


Figure 15

### The Gold Stock and the Monetary Base

By mid-December 1914, about a month after opening for business, the Federal Reserve lowered discount rates at all member reserve banks as market interest rates fell. However, the Fed's gold reserves had a very high ratio to the portion of monetary base that it issued. As mentioned previously, the Fed's government securities at the end of 1916 only totaled about \$55 million and thus the Fed struggled to control the fluctuations in the monetary base created by gold flows. Government securities were purchased in bulk between 1915 and 1916, and even larger purchases after the United States entered the war in April 1917 were made to increase the Reserve Banks' earnings. There is a noticeable increase in the Fed's gold reserves in June 1917. The Fed-issued monetary base increased even faster, taking away share from the non-Fed-issued monetary base. The Federal Reserve intended to increase the reserve requirements, or cash reserve ratios, of member commercial banks to help offset the increases in gold inflows, but Congress denied its requests. The United States did not anticipate their involvement in World War I, and it realized the resulting inflow of gold assets could not be controlled due to the initially small size of the Fed's portfolio at its inception. Almost immediately after the U.S.

entered World War I, the monetary base rose from \$772 million in April 1917 to \$1.5 billion at the end of June. Banks increased their deposits of gold at the reserve banks, as vault cash was not recognized as an item in the reserves after June 1917. Within a few months after the war began, exports to the United States increased and therefore gold inflows too upon payment. By 1918, the monetary gold stock had increased by about 65 million troy ounces (equal to about \$1.3 billion at the official gold price of \$20.67 per ounce).

Looking at Figure 15, monetary base was substantially boosted by the inflows of gold in the early years as it coincided with the war. From 1915 to 1922, the annual growth of the monetary base was perennially positive except in 1921. After World War I, both the monetary base and total gold reserves ceased growing. The monetary base fluctuated at around \$4 billion throughout the Roaring Twenties, in part due to Congressional acts dealing with the structural organization of the Federal Reserve. During the same period and into the Great Depression, the total gold stock hovered around \$3.9 billion to \$4.1 billion. The McFadden Act, signed on February 27, 1927, renewed the Federal Reserve Banks' charters permanently and gave members more freedom in the sizes and types of loans they could create. Logically, the act should have increased the monetary base, but clearly it did not make a significant difference. Only until after the Depression did monetary base escape the \$4 billion range – exponentially growing until the onset of World War II.

Both the gold stock and gold reserves increased in 1933. They reached \$7.5 billion in March 1934 and steadily increased until the end of 1941. Total gold stock and gold reserves reached \$22.7 billion and \$20.5 billion, respectively. However, after passage of the Gold Reserve Act of 1934, it became illegal for private citizens to hold monetary gold in the United States. Only specialized civilians, such as dentists, jewelers, and coin collectors, could legally obtain gold. The monetary gold not held by the Federal Reserve was held by the Treasury. As has been noted, the Fed did not directly own gold itself; rather, it owned gold certificates that were a claim on the Treasury's gold stock. And since foreigners could still hold gold, the revaluation of gold in 1934 from \$20.67 to \$35 per troy ounce devalued the dollar and led to a large influx of foreign gold as foreigners exchanged gold for dollars. At this point, the Federal Reserve System hardly engaged in purchases of government securities as the excess reserves from this rapid incursion of gold made it meaningless to do so. By the end of our period of focus, Fed gold reserves and Fed monetary base had risen to \$20.5 billion and \$20.6 billion, respectively. On the other hand, total gold stock was recorded at \$22.7 billion and total monetary base registered at \$23.8 billion.

## **Conclusions**

Since the establishment of the Federal Reserve System, there were divisions within the System on how to best govern and respond to the significant events that have occurred throughout the course of the 20<sup>th</sup> century. With these events came prosperity and despair, contraction and expansion, and inflation and deflation. World War I began when the United States was in the middle of a contractionary business cycle, and after Federal Reserve banks began their operations in November 1914, gold started to flow in along with the subsequent monetary



expansion and inflation, to which further measures had to be taken by both the Federal Reserve System and the United States Treasury. After World War I, the Federal Reserve had to solve the issues of establishing a separation from the Treasury in addition to reversing wartime inflation. Despite the “Forgotten Depression” of 1920-21, the 1920s were overall a period of high opulence. The economy experienced a boom as the Fed learned to understand the effects of their open market operations on their member banks’ reserves. Seasonal movements in currency were offset by open market purchases and sales, and the stock of money did not actually rise during this economic expansion – a marvel that never happened in other cyclical expansions. The pandemonium brought by the Great Depression brought a shock to many of the previously thought-to-be solid structures within the monetary base, along with gold reserves, deposits, etc. Although some may argue that monetary policy carried most of the blame for the failure of the banking system, New Deal changes in banking structure turned monetary policy into an effective tool and reduced money itself down into a minority role in changing the course of economic history in the early 20<sup>th</sup> century.

### **Postscript: Accompanying Spreadsheets**

An accompanying spreadsheet workbook contains all the important data, graphs and calculations associated with this paper. It includes the fully digitized weekly Federal Reserve balance sheets from 1914 to the end of 1941. The workbook also contains a bit of data not explicitly used in the paper that still may be useful to other researchers. We thank Dr. Kurt Schuler for data from 1914 to 1926, which are mainly from Federal Reserve annual reports but have been checked against the weekly H.4.1 statements. For data from 1927 to 1941, we relied entirely on the weekly H.4.1 statements.

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