

# The Global Financial Crisis and Friedman's Theory of the Great Depression

Shigeyuki Hattori (Doshisha University)

## Abstract

Economist Milton Friedman argued that the Great Depression resulted from the collapse of money. He further argued that the banking crises at the time was attributable to the Federal Reserve's monetary policy tightening. His theory of the Great Depression has also been implemented to prevent events like the 2008 global financial crisis from occurring. If Friedman were correct, even if the United States housing bubble burst in 2008, there would have been no global financial crisis unless the then Federal Reserve Chairman, Bernanke, had made mistakes regarding his monetary policy. The 2008 global financial crisis cast doubt on Friedman's theory. Furthermore, Friedman argued that the recovery from the Great Depression was due to an increase in the money stock. However, after the financial crisis, central banks in Japan, the United States, and Europe were unable to increase their money stock despite adopting quantitative easing. On the contrary, the collapse of money, according to Friedman, was the result of banking crises. We argue that his distorted Great Depression theory led to incorrect policymaking by the Federal Reserve and other United States policymakers, thereby triggering the global financial crisis.

Keywords: Milton Friedman, Great Depression, global financial crisis, monetary policy, Minsky, financial instability hypothesis

JEL: B31, B22, E51, E52, G01

## Introduction

The Great Depression of the 1930s was a financial crisis that will go down in world history alongside the global financial crisis of 2008. Milton Friedman, a leading economist from the University of Chicago, argued that the Great Depression resulted from the Federal Reserve's monetary policy failure, as their monetary tightening caused both a monetary collapse and banking crises that created and sustained the Great Depression. It then follows that the stock market crash of 1929 was not the cause of the Great

Depression.

Friedman's theory of the Great Depression was not limited to the study of history but also aimed to prevent further global financial crises. While the Federal Reserve has employed strategies to deal with bubbles based on Friedman's theory of the Great Depression, and the current monetary policy framework itself owes much to his theory of money and monetary policy, neither of these successfully prevented the global financial crisis of 2008. The global financial crisis and the subsequent economic stagnation of the United States (U.S.) and the world were events that cast doubt on Friedman's theory of the Great Depression.

Historical phenomena are one-time events, and the correctness of a historical narrative should be judged on the basis of the cases evaluated. However, one should also consider the term "lessons of history." In light of this, the first aim of this study is to clarify how Friedman's analysis of the Great Depression failed to prevent the global financial crisis.

Friedman argued that the Great Depression resulted from the collapse of money but also admitted that the collapse of money was the result of banking crises. Nevertheless, he argues that the Federal Reserve could have prevented the collapse of money through its open market operations. However, Friedman's claim is a theoretical inference, not a historical fact. After the global financial crisis, the central banks of Japan, the U.S., and Europe conducted historical experiments to verify whether his reasoning was correct. At the Bank of Japan (BOJ), this was done under Governor Haruhiko Kuroda. The second aim of this study is to re-examine Friedman's theoretical reasoning based on the historical experiment of Kuroda's BOJ. Finally, as the Great Depression is one of the two largest financial crises, along with the global financial crisis, this study aims to show, using the economics of the financial crisis, that Friedman's collapse of money is only the result of the banking crises.

First, we show that Friedman's study of the Great Depression could not explain the global financial crisis and that his policy recommendations did not help prevent it. Second, Friedman argued that the collapse of money was the responsibility of the Federal Reserve. This is because he believed that the Federal Reserve can increase the money stock through an increase in the monetary base. However, based on the Quantitative and Qualitative Monetary Easing (QQE) of the BOJ under Governor Kuroda, this way of thinking is incorrect. Third, the Great Depression in the U.S. can also be explained by the economics of the financial crisis, and the collapse of money referred to by Friedman is also the result of the collapse of finance.

## Is the Global Financial Crisis a Theoretically Impossible Event?

Until the global financial crisis in 2008, the Federal Reserve had a strategy to deal with the financial bubble. This strategy assumed that: 1) America's security market-centric financial system can properly manage risks (see Kohn, 2005); 2) the monetary policy can stabilize the business cycle by controlling prices (see Bernanke, 2000b, 2004); and 3) the Federal Reserve should ignore the bubble. After the bubble burst, if monetary policies were eased, the economy would recover quickly (see Bernanke, 2002).

This "mop-up strategy" after the bubble burst has been heavily influenced by Friedman, who famously argued that the Great Depression resulted from the Federal Reserve's monetary tightening that sharply reduced the money stock. This argument further suggests that the bursting of the bubble and market instability were not the causes of the Great Depression. On the contrary, he argued that speculation stabilizes the market (Friedman, 1953, 1969c). The failure of monetary policies also implies that Keynesian fiscal policies are not necessary to restore the economy.

Friedman also argued that the Federal Reserve's tightening of monetary policy in 1928–1929 to curb stock bubbles and speculation was a mistake. This tightening was not severe enough to halt bullishness in the stock market, but it was severe enough to halt economic expansion (Friedman and Schwartz, 1963, pp. 297–298). The Federal Reserve should not have been a speculator or judge of securities' prices, nor should it have been directly interested in the stock market boom (Friedman and Schwartz, 1963, pp. 291–292).

Friedman (2005) compared the bubbles in the 1920s and 1990s in the U.S. with that in the 1980s in Japan. In all three cases, stock prices plunged after the bursting of the bubble. However, in the U.S., during the 2000s, when the money stock continued to increase as before, the economy grew steadily. Conversely, in the U.S. during the 1930s, when the money stock plummeted, the economy fell sharply. The bubble in Japan in the 1990s stood in between the two. From this, Friedman (2005) concluded that even if a bubble bursts, the deterioration of the economy can be stopped if monetary policy steadily increases the money stock.

Bernanke, an economist, has been influenced by Friedman's theories of the Great Depression and monetary policy. In 2004, when he was a Governor of the Federal Reserve, he presented a lecture titled "Great Moderation." He argued that in the U.S., the moderation of the business cycle resulted from monetary policy to stabilize prices (Bernanke, 2004). It means that, theoretically, a crisis like the global financial crisis

should not occur.

Bernanke inherited Friedman's mop-up strategy to address the bursting of a bubble. He too argued that it was a mistake for the Federal Reserve in the 1920s to tighten its monetary policy to prick the asset bubble (Bernanke, 2002). As for the long-term stagnation of Japan since the 1990s, he argued that the cause was neither the bursting of the bubble nor the non-performing loan problem but rather that the BOJ had not solved deflation through monetary easing (Bernanke, 2000b). Friedman, however, did not believe that deflation would inevitably bring the economy to a standstill (Friedman and Schwartz, 1963, p. 15, p. 678); rather, he stated that the 1920s in the U.S. was also a time of deflation (Friedman and Schwartz, 1963, p. 298).

According to the economics of Friedman and Bernanke, the 2008 global financial crisis was an event that, theoretically, could not have occurred. Therefore, after the crisis, criticisms of mainstream macroeconomics spread. As Krugman stated, "much of the past 30 years of macroeconomics was 'spectacularly useless at best, positively harmful' at worst;" Eichengreen said, "crisis 'cast into doubt much of what we thought we knew about economics'" <sup>(1)</sup> (both from *The Economist*, 2009, p. 9). For the same reason, the global financial crisis cast doubt on Friedman's theory of the Great Depression.

#### The Federal Reserve's Assessments of the Situation were Incorrect

Friedman criticized the Federal Reserve for making mistakes in policy during the Great Depression and for the stagflation of the 1970s. Since the 2000s, the Federal Reserve has further made several mistakes in assessing the situation. These included the housing bubble period, the period after the bubble burst, the acceptance of the bankruptcy of Lehman Brothers, and the recovery period of the economy. Each period is discussed in turn in this section.

During the housing bubble, financial institutions lent out mortgages to households that would normally be unable to repay their mortgages. This was because past loans could be easily repaid by individuals by refinancing new loans using their house—whose price had risen—as collateral. The expansion of these low-quality loans further expanded the bubble. However, Greenspan (2004), then chairman of the Federal Reserve Board, did not understand this mechanism and argued that household debt management was good given that the delinquency rate of households was low. The delinquency rate for subprime mortgages, in particular, was at a historically low level because people were refinancing new loans and repaying old ones. Greenspan (2004), as well as Bernanke (2005),

acknowledged that household debt was growing. However, this was not a problem because the net worth of households had further increased.

In the Spring of 2007, following the bursting of the housing bubble, the nonperforming loan problem of mortgage loans, especially subprime mortgages, arose. In May 2007, Bernanke (2007) argued that the subprime mortgage problem was limited. Furthermore, in September, Governor Mishkin (2007) insisted that the U.S. financial system was healthy. Ultimately, Lehman Brothers failed on September 15, 2008. However, according to a forecast by the staff of the Federal Open Market Committee (FOMC), on September 10, economic growth (annualized) was 0.8% for the second half of 2008 and 2.1% for 2009. Therefore, even just five days before the failure of Lehman Brothers, the staff of the FOMC believed that there would be no financial crisis and that the U.S. economy would be on track to recover in 2009 (Federal Open Market Committee, 2008a, I-13).

The Federal Reserve's miscalculation culminated in its acceptance of the failure of Lehman Brothers. The global community questioned why the U.S. authorities had allowed Lehman Brothers to fail, which triggered the global financial crisis. However, on September 23, Bernanke (2008) explained to the U.S. Senate why he had permitted the collapse of Lehman Brothers:

But the troubles at Lehman had been well known for some time, and investors clearly recognized ... that the failure of the firm was a significant possibility. Thus, we judged that investors and counterparties had had time to take precautionary measures.

Investment banks, such as Lehman Brothers, borrow short-term debt from the market and use it for investment purposes. Therefore, if the counterparty withdraws short-term funds, investment banks face bankruptcy.

At the FOMC (2008c) meeting held the day after Lehman Brothers' failure, several participants argued that accepting bankruptcy was the correct policy to reestablish market discipline. At that time, the FOMC (2008b) believed that the threat of inflation was more important than that of the financial crisis. After the financial turmoil subsided, they were planning to raise interest rates to contain inflation.

The last period concerns the recovery of the economy. Figure 1 illustrates the rate of real gross domestic product (GDP) growth and those of the FOMC staff forecasts. After the global financial crisis, the staff expected the U.S. economy to make a V-shaped recovery, occasionally growing at a rate exceeding 5%. In reality, it was an L-shaped recovery, leading to a secular stagnation controversy.

From the above, it is clear that the Federal Reserve made serious errors in its strategy and situational assessments. However, Bernanke, Geithner, and Paulson (Bernanke et al., 2020, pp. 1–2), who dealt with the global financial crisis as chairman of the Federal Reserve Board, president of the Federal Reserve Bank of New York and Secretary of Treasury, first cited a lack of power as a lesson from the global financial crisis.

We argue in this chapter that unpopularity of the government response, despite its effectiveness, stems in significant part from the fact that the government entered the crisis with inadequate powers and an outdated regulatory structure, which forced a more improvised and constrained set of powers than might otherwise have been possible.

U.S. policymakers did not have enough power because they believed that the global financial crisis could be prevented by proper monetary policy and did not expect a financial crisis to occur. Refusing to acknowledge their lack of judgment and shifting the blame to a lack of power is another criticism against the Federal Reserve of the Great Depression era, made by Friedman and Schwartz (1963, pp. 418–419). However, since the 2000s, the Federal Reserve has made several errors by following Friedman’s lead.

#### There is Nothing New in Theory in the Global Financial Crisis

Fortunately for economics and economists, not all economists have been as incorrect as Greenspan and Bernanke. After the 2008 crisis, Minsky’s financial instability hypothesis attracted attention. Minsky (for example, 2008 [1986], pp. 231–232) coined the term “Ponzi finance” to describe the scenario of a borrower whose cash flow is less than interest payment. Furthermore, he stated that Ponzi finance could be fraudulent even without malicious intent. Minsky (1982, p. 31) argued that when asset prices rise, Ponzi finance may expand by capitalizing on that rise, and the financial system may become fragile. When the margin of safety declines in this way, a financial crisis occurs. The process from the U.S. housing bubble to the financial crisis followed Minsky’s description.

Minsky is not alone. Kindleberger (2000) used the Minsky model to explain the process from the bubble “craze” to the financial crisis. Galbraith (1990[1993]) did not mention Minsky but similarly described the financial crisis. Additionally, when the Japanese bubble burst in the early 1990s, Miyazaki (1993) argued that a compound recession with

stock adjustments was different from a normal recession. Mitsuharu Ito, Professor Emeritus of Kyoto University, referenced both Miyazaki's theory of compound recession and Galbraith to explain that a bubble is not a rise in asset prices. In a bubble, people accumulate debt in anticipation of a rise in asset prices, but when the bubble bursts, asset prices crash, and the debt remains intact. Owing to this, those who are burdened with debt go bankrupt.

The second part of the book by Hunter et al. (ed.; 2003) contains studies on various market bubbles: the U.S. stock bubble (Mishkin and White, 2003), the bubble in the 1980s and its bursting in Japan (Okina and Shiratsuka, 2003), the East Asian crisis of the 1990s (Collins and Senhaji, 2003), and the Latin American bubble of 1980–2001 (Herrera and Perry, 2003). Hoshi (2003), a commentator on these studies, discussed the similarities of these cases despite their different periods and geographies. The first concerns the universality of the bubble. The second similarity is the correlation between the rapid growth of credit, especially bank credit, and the emergence of bubbles. The third is that when a bubble bursts, the economy is often hit hard. Finally, the existence of a robust financial system holds the key to the difference between a costly rupture and a less costly rupture. Despite their correlated views, Hoshi did not mention Minsky.

Furthermore, Hettinger, Jr. (Friedman and Schwartz, 1963, p. 811), a director of the National Bureau of Economic Research at the time, expressed his dissent in his "Director's Comment" on Friedman and Schwartz' (1963) *A Monetary History of the United States*.

With holding company superimposed on holding company, call loan for "others" mounting by the billion" might well have cumulated economic maladjustments whose correction was merely postponed.

It is also an objection regarding Greenspan, who continued to ease monetary policy during the housing bubble of the 2000s.

Incidentally, the global financial crisis resulted from the failure of the Federal Reserve's "mop-up" strategy. As Minsky and others have stated, a bubble often expands debts that cannot be repaid without a bubble. Therefore, leaving a bubble unattended further means leaving the expansion of debts that cannot be repaid without a bubble unattended. Accordingly, after the bursting of the bubble, the non-performing loans held by financial institutions will increase. Thus, the "mop-up" strategy can be described as disastrous. Unable to comprehend this, Bernanke and the Federal Reserve adopted this

strategy and triggered the global financial crisis <sup>(2)</sup>. However, it is debatable whether monetary policy or financial regulation is the correct policy tool to prevent the expansion of debt that cannot be repaid without a bubble.

Economists who discuss financial crises have identified that financial crises are a repetition of the same routine. However, those who believe that a new era has come state that the failures of the past will not be repeated (see Minsky, 2008 [1986], pp. 237–238, and Galbraith, 1994 [1990], pp. 87–89). This is a belief that the Federal Reserve and others repeated in the housing bubble in the 2000s.

Therefore, after the global financial crisis, a book was published with the ironic title, *This Time IS Different* (Reinhart and Rogoff, 2009); however, their research started before the 2008 financial crisis. In the preface of its Japanese edition, it is stated that the overall picture of Japan’s “lost decade” since the 1990s is not so different from many countries that have experienced financial crises (Reinhart and Rogoff, 2011, v). In addition, as banking crises occur frequently in countries with different income levels and political systems and leave traces of macroeconomic severity, their cause is not the successive failures of regulators and central banks but the human nature of arrogance and ignorance (Reinhart and Rogoff, 2011, vi).

Furthermore, Minsky’s successors, American Post-Keynesian economists, warned against the spread of accumulated excess debt during the IT bubble of the late 1990s and the housing bubble of the 2000s. For example, Papadimitriou et al. (et al., 2006, p. 1) stated as follows:

We show that the precarious financial position of households stems largely from loose lending standards and the heightened cash-out refinancing of recent years. Noting that when and where housing prices have fallen, borrowing and growth have slowed, we turn our attention to the plausible effects of a slowdown in housing prices on household spending, economic growth, and sectoral balances. We show that the optimistic forecasts of the Congressional Budget Office rely on sustained private-sector borrowing. We then simulate the impact of a drop in house prices and reduced borrowing and conclude that GDP growth will slow.

After the crisis, Godley et al. (2008) were among the first to predict that the economic recovery would be delayed due to debt-ridden households cutting their spending <sup>(3)</sup>.

Not a few economists responded to the global financial crisis; it was as if an event had occurred that could not be explained by existing economics. This is incorrect as, on the



contrary, there is nothing novel in theory about the global financial crisis. Additionally, some Post-Keynesian economists also warned of danger. For Minsky and the Post-Keynesian economists, it was a crisis that was bound to occur. Nevertheless, Bernanke and other officials of the Federal Reserve believed that there would be no global financial crisis until it actually happened.

### Policies that have Overcome the Crisis: What is Important is not Money but the Financial System

The 2008 financial crisis ended without an economic collapse similar to the Great Depression. Therefore, did Friedman's theory of the Great Depression help overcome the crisis?

There were four banking crises during the Great Depression, and Friedman outlined that ignoring the banking crises were a failure. However, this was not because financial institutions had failed to go bankrupt but because they had reduced the money stock by a third (for example, Friedman, 1969b, p. 100). The majority of the money, both then and now, is in bank deposits. At that time, no national deposit insurance system was in place. Therefore, amid the banking crises, there were bank runs, and deposits plummeted. Conversely, safe cash was on the rise, but due to its small size, it had little impact on the whole. Furthermore, safe postal savings increased. This follows the reality of the collapse of money during the Great Depression.

As a result of learning from the mistakes of the 1930s, deposit insurance is now in place to prevent the banking crises from reducing deposits. Even if a bank fails, deposits can be maintained by becoming de facto government debt. Therefore, on the contrary, it should be possible to leave the bankruptcy of a bank unchecked. Additionally, Lehman Brothers was investment bank and American International Group (AIG) was insurance company, both of which did not keep deposits. According to Friedman, these financial institutions should be allowed to fail based on market discipline. With the exception of Lehman Brothers, however, U.S. policymakers did not distinguish between banks and non-banks and bailed out all too big to fail financial institutions with systemic risk. The U.S. policymakers prevented the Great Depression from happening again by preventing the financial system from collapsing through fiscal policy rather than monetary policy. Friedman's recommendations are not used in these strategies <sup>(4)</sup>.

Friedman, however, emphasized the concept of the central bank as "the lender of last resort" and went so far as to say that the Federal Reserve's failure to act as the lender of

last resort and inability to cash out bank deposits caused the banking crises during the Great Depression (Friedman, 1965, p. 10). Applying Friedman's words to the 2008 crisis, Bernanke could have prevented the financial collapse by simply acting as the lender of last resort, without the government bailing out financial institutions.

Friedman further believed that the lender of last resort function is a means of increasing the money stock through an increase in the monetary base. It means that the lender of last resort is not needed for non-banks and financial markets that are not the suppliers of money. However, during the global crisis, the Federal Reserve expanded its lender of last resort function to non-bank financial institutions and financial markets to alleviate the liquidity crisis. This also shows that U.S. policymakers had attempted to protect the financial system.

Today, in the case of the U.S., banks do not ordinarily borrow from the Federal Reserve in normal times. Therefore, if a bank borrows from the Federal Reserve amid a crisis, it will be stigmatized as a financial institution in poor financial condition. This "stigma effect" makes it difficult to provide liquidity to financial institutions that need it the most. To solve the "stigma effect," a new mechanism was created to facilitate the borrowing from the Federal Reserve in the form of a bid. However, open market purchases would have been sufficient to increase the monetary base.

During a financial crisis, the flight-to-quality phenomenon lowers the interest rate charged to safe borrowers. However, the interest rates charged to borrowers at high risk of bankruptcy increase sharply. Initially, risky borrowers will not be able to borrow even at high interest rates. To prevent this, it is necessary to provide funds to financial institutions and financial markets where liquidity crises have occurred, which is the aim of the lender of last resort. Conversely, the lender of last resort does not aim to increase the monetary base but implements a banking policy to stabilize the financial system. It is also one of the credit policies that controls credit usage and prices. It was Friedman (see Friedman and Schwartz, 1963, pp. 448–449) who emphasized distinction between credit policy and monetary policy.

Keister and McAndrews (2009, pp.1–4), staff members of the Federal Reserve Bank of New York, explain the purpose of the Federal Reserve's "quantitative easing" since September 2008. Some banks have excess funds, and others have liquidity shortages. Under normal circumstances, banks that are short of funds borrow from banks that have excess funds in the interbank market. Therefore, it is sufficient for the Federal Reserve to ensure that there is no excess or shortage of funds in the market as a whole. However, during a financial crisis, banks with excess funds hesitate to lend out funds because they

perceive a high risk of default in lending to other banks. As a result, banks with insufficient funds face liquidity crises. Therefore, the Federal Reserve's credit injection was developed to solve the liquidity crisis in underfunded banks.

The lender of last resort has a long history as a central bank policy. However, it does not necessarily need to be implemented by a central bank. Injecting capital into financial institutions is supposed to be the job of the government, not the central bank. Capital injections are highly likely to suffer losses, and when government suffers a loss, it effectively gives a subsidy, and a de facto fiscal policy is implemented. Following this, if the government can buy shares from financial institutions for capital injections, it could theoretically lend that money to financial institutions as the lender of last resort.

Friedman proposed monetary policy to further prevent the next Great Depression. However, U.S. policymakers prevented a repeat of the Great Depression by bailing out financial institutions and avoiding a financial collapse through fiscal policy. Therefore, U.S. policymakers prevented the crisis by doing the opposite of Friedman's policy proposals.

#### Central Banks Fail to Increase Money Stock: Resurrecting the Liquidity Trap

After the financial crisis subsided in 1933, the U.S. entered an era of historically low interest rates. In this situation, it was said that there was a limit to the monetary easing policy because there was a lower bound on interest rates. Keynes' liquidity trap is a prime example of this. Furthermore, in the U.S., a similar comment was made: "You could pull on it to stop inflation but you could not push on it to halt recession" (Friedman, 1969b, pp. 95–96). However, it was Friedman who later objected to this. Friedman perceived an increase in the money stock as a tool for monetary easing. Conversely, he argued that if the inflation rate rose through monetary easing, the interest rate would rise. If this were correct, there could be no liquidity trap.

Friedman further acknowledged that the sharp decline in the money stock during the Great Depression was the result of banking crises. Nevertheless, he criticized the collapse of money as a failure of the Federal Reserve's monetary policy because he believed that increasing the monetary base could increase the money stock by following the mechanism of the money multiplier theory.

However, this is a theoretical inference, not a historical fact. Tobin (1990[1965], pp. 211–212), in his review article of *A Monetary History of the United States*, indicated that after the financial crisis subsided, there was a great volume of excess reserves. Friedman

and Schwartz explained that the excess reserves arose from the fact that banks that had experienced bank runs during the banking crises wanted to accumulate reserves beyond the legal minimum reserves. In response, Tobin gave an explanation based on the Keynesian theory of liquidity preferences. In other words, banks prefer to hold government bonds and commercial paper until interest rates reach zero, but when they approach zero, they prefer to hold cash (i.e., excess reserves).

Kaldor (1990[1970], pp. 517–519) pointed out that the monetary base increased during the Great Depression. As an increase in the monetary base did not lead to an increase in the money stock, he criticized Friedman’s reasoning as incorrect. Krugman (1998, Figure 3, pp. 155–157) made a similar point, arguing that money is a complete substitute for bonds when interest rates are zero. Again, this is an explanation based on Tobin’s theory of liquidity preference.

Figure 2 illustrates the money stock and monetary base based on the appendix to *A Monetary History of the United States* (Friedman and Schwartz, 1963) (excess reserves are different). The monetary base declined in the initial phase of the Great Depression, but after the first banking crisis in October 1930, it began to increase. Nevertheless, the banking crises caused a sharp decline in the money stock. Friedman explained that this was due to a decrease in the money multiplier as a result of the banking crises, as public demand for cash and bank demand for reserves increased. When the money multiplier decreases, the increase in the money stock per unit of the monetary base decreases, but if the monetary base increases, the money stock still increases.

However, only experimentation can tell whether Friedman’s reasoning was correct. An important historical experiment was conducted by the central banks of Japan, the U.S., and Europe after the global financial crisis (although the BOJ had been conducting experiments before the 2008 global financial crisis). In particular, the BOJ, under Kuroda, commenced an experiment for both quantitative and qualitative easing policies in April 2013.

Figure 3 illustrates the monetary indices of Japan since 2005. Under Kuroda, the BOJ’s monetary base soared. However, the money stock has not increased in parallel with the increase in the monetary base. Moreover, the surge in the monetary base has led to a sharp increase in the current accounts of the BOJ. These results would support Tobin’s and others’ criticisms outlining that Friedman’s reasoning was incorrect.

After the global financial crisis, the central banks of Japan, the U.S., and Europe sharply increased their monetary bases, obtaining similar results. Goodhart (2010) identified that, in one year between September 2008 and September 2009, bank reserves

surged nearly 20-fold in the US, nearly 5-fold in the UK, and more than doubled in the eurozone and Japan, but neither broad money nor bank lending to the private sector increased substantially. He further stated that banks accumulated excess reserves without lending or buying securities because of their low rates of return adjusted for those risks. These facts, he argued, showed that the money multiplier theory is incorrect. Based on similar data, Iley and Lewis (2013, p. 93) examined the rapid increase in excess reserves, such as in the 1930s, and whether excess reserves were desirable.

Additionally, short-term interest rates in Japan have been almost zero since the latter half of the 1990s. Under Kuroda, the BOJ's long-term interest rates have also reached near zero. It is correct to say that the situation wherein both short-term and long-term interest rates are near zero is the result of the BOJ's inability to resolve deflation. However, this is not because the BOJ has not been conducting monetary easing but rather because it has been unable to resolve deflation despite aggressive monetary easing. Therefore, Friedman is doubly incorrect.

It was mentioned earlier that Friedman argued that the occurrence of excess reserves during the Great Depression was caused by the financial crisis. However, while this might apply to the central banks in Europe and the U.S. immediately after the global financial crisis, it cannot be applied to Japan, which had nothing to do with the financial crisis. Moreover, Friedman's argument did not apply to the U.S. during the Great Depression. If Friedman's argument were correct, then when the financial crisis subsided in March 1933, excess reserves (at least as a percentage of deposits) would have declined. However, the excess reserves increased sharply after the financial crisis subsided. In March 1933, when the financial crisis was at its deepest, the excess reserves were \$250 million, or 1% of bank deposits. By January 1936, however, they were \$3 billion, or 9% of bank deposits<sup>(5)</sup>. Even if some of the excess reserves in 1936 resulted from the financial crisis, this could only be less than 1% of the deposits, and for the most part, it was simply excessive.

The current monetary policy framework is Wicksellian, where short-term interest rates are used as a policy tool. According to this framework, if the actual interest rate is higher than the neutral interest rate, a deflationary spiral will occur. However, although Japan has fixed the short-term interest rate at near zero for more than 20 years, a deflationary spiral has not occurred. It indicates that the effects of monetary policy on prices are negligible at best. This, too, supports the assertion that the monetary policy is ineffective under Keynesian liquidity traps.

At the heart of Friedman's Great Depression theory is the idea that a sharp decline in the money stock is the result of Federal Reserve policy. However, the historical

experiment of the central banks after the global financial crisis, especially at the BOJ, has shown that this claim was unfounded. Conversely, it has been proved that the monetary policy is subject to a liquidity trap by lowering interest rates to zero.

## Deficit Fiscal Policy and Money Stock

Why is the money stock not increasing? Monetary surveys show the assets and liabilities of the central banks and depository institutions (see Table 1). In this section, we will use monetary surveys to show why an increase in the monetary base did not lead to an increase in the money stock.

In the balance sheet (Consolidated Table) that integrates the central bank and depository institutions where assets and liabilities between the two are offset, assets consist of credit to the private non-financial sector, central government, and other borrowers, and liabilities consist of the money stock (cash and deposits) and non-monetary liabilities. Therefore, when the money stock increases, the assets of the consolidated sector (the sum of the central bank and depository institution) will increase, the non-monetary liabilities will decrease, or both will occur.

McLaey et al. (2014) argued that quantitative easing does not increase bank lending but increases the money stock by purchasing government bonds from non-depository institutions. In what follows, the approach is the same, but by changing the examples, we will clarify the reasons why the massive open market purchases of the BOJ do not increase the money stock and why the deficit fiscal policy increases the money stock.

First, suppose that a central bank purchases 100 billion yen of Japanese government bonds (JGB) from depository institutions through open market purchase. At this time, the central bank's JGB holdings will increase, but the holdings of JGBs by depository institutions will decrease by the same amount. As a result, the assets in the consolidated sector do not increase. If non-monetary liabilities do not change, money does not increase. However, depository institutions receive 100 billion yen of current accounts at the BOJ as payment for government bonds. The money multiplier theory claims that depository institutions use 100 billion yen of current accounts for lending. If this were correct, lending, deposits, and cash would increase cumulatively due to the multiplier effect (see A in Table 2).

However, under Kuroda's BOJ, Japan has not experienced such an increase in lending. If lending does not increase, the amount of 100 billion yen received by the depository institutions will only constitute current accounts at the BOJ and will not increase the

money stock (see B in Table 2). Even before Kuroda assumed leadership of the BOJ, it was said that lending in Japan would not increase even if the monetary base increased. Furthermore, in the U.S. during the Great Depression, the monetary base increased, but lending contracted during the banking crises. This sharp decline in lending also led to a sharp decline in the money stock. If the monetary bases were the same, excess reserves would have rapidly increased.

Keister and McAndrews (2009) also argued that excess reserves do not increase bank lending. Under normal circumstances, banks increase money by lending to earn interest. However, if the interest rate is zero and the loan is not profitable (after risk adjustment), the loan will not be made. As a result, the money multiplier process does not work. Moreover, if the Federal Reserve pays interest on excess reserves, banks will stop lending at interest rates higher than zero.

However, lending is not the only asset in the consolidated sector. Suppose the government issues 100 billion yen of JGBs and the BOJ purchases them. The government will spend the 100 billion yen it receives, and the recipient then holds the funds either as cash or a deposit. The combination of deficit fiscal policy and the BOJ's purchases of JGBs can increase the money stock by increasing the assets of the consolidated sector. However, as Table 2-C shows, when most of the 100 billion yen received are deposited with depository institutions, excess reserves increase. According to McLaey et al. (2014), government bonds are to be purchased from sources other than depository institutions. In this case, the holdings of government bonds by depository financial institutions will not decrease. Therefore, the money stock will increase without a fiscal deficit.

In Japan, currently, excess reserves are accumulated in depository institutions (because, in practice, depository institutions cannot refuse deposits). However, there is a shortage of satisfactory borrowers and securities. Under these circumstances, if the government issues 100 billion yen of JGBs, depository institutions will purchase them. As a result, the assets of the consolidated sector will increase by 100 billion yen, the money stock will increase accordingly, and excess reserves will decrease <sup>(6)</sup> (see Table 2-D). Thus, this example shows that government bond issuance increases the money stock. However, the same table applies if a depository institution purchases 100 billion yen of JGBs from a source other than a depository institution.

Figure 4 shows the relationship between Japan M3 and credits of the consolidated sector since January 2005. From this figure, it can be seen that M3 and credits are increasing almost in parallel. "The other sectors" in the figure are the credits of depository institutions to non-financial private sector. Most of it comprises lending. Since 2005,

however, their increases have been minor. Conversely, what has increased significantly are credits toward the central government. As shown in the example in Table 2-D, M3 in Japan increased until the start of the quantitative and qualitative easing policies, mainly due to the government's issuance of large amounts of JGBs and the purchases of them by depository institutions <sup>(7)</sup>.

Friedman and other proponents of the money multiplier theory would consider the BOJ's massive supply of monetary base to have caused a surge in credit toward the government. However, Kuroda's BOJ disproved this hypothesis, because if monetary easing were the cause, the credit of depository institutions to the government would have increased sharply. On the contrary, depository institutions sharply decreased credits to the government. As Table 2-B shows, when the BOJ purchases JGBs, the seller's depository institutions reduce their holdings of JGBs.

However, since 2020, the credit of depository institutions to other sectors has increased sharply. Owing to the spread of COVID-19, sales in the food and beverage, hotel, and tourism industries have contracted. The need to pay fixed costs such as rent has led to a surge in borrowing demand. The Japanese government and BOJ have made it easier for people to borrow money from financial institutions as part of the policy measures to combat the economic effects of the COVID-19 pandemic. As a result, the rapid increase in lending by depository institutions has led to a temporary surge in the money stock from 2020. It is a variant of Table 2-D, which converts government debt into lending to the non-financial private sector. This surge in lending is not the result of the BOJ's monetary policy because the surge in credit and M3 ended in 2021 <sup>(8)</sup>.

Based on this, Figure 5 shows the results of creating a monetary survey of the U.S. since the 1920s. However, the classification of the statistics is different from that in present-day Japan as, especially at that time, gold was an important asset for the Federal Reserve.

After the financial crisis of 1930, bank lending and M2 plummeted. The financial crisis subsided in 1933; however, lending remained stagnant. The U.S. withdrew from the gold standard in 1934. Since then, the Federal Reserve's gold holdings have skyrocketed. This has led to an increase in M2. Conversely, what has received little attention is that banks have increased their holdings of government bonds since the Great Depression. In the 1940s, as the U.S. entered a wartime economy, banks' holdings of government bonds increased further. Moreover, in the U.S. after 1930, banks increased their money stock by purchasing government bonds (see also Hattori, 2005, Chapter 6, pp. 149–177.)

In the U.S. in the 1930s, variants of Tables 2-C and 2-D were applicable. The variant



in Table 2-C is that the U.S. monetary authorities did not buy government bonds but stored gold. Consequently, it increased their money stock and excess reserves. Moreover, purchasing government bonds issued by banks also increased the money stock.

Friedman argued that the sharp decline in the money stock during the Great Depression was due to the Federal Reserve's tightening of monetary policy (or rather, failure to ease sufficiently). However, we have identified that deficit fiscal policy has also contributed to the increase in money. Friedman's failure to understand this led him to overestimate the effects of monetary policy and underestimate the effects of fiscal policy <sup>(9)</sup>.

### The Collapse of Money is the Result of Financial Crises

The Great Depression is one of the two largest financial crises that the world and the U.S. have experienced thus far, along with the 2008 global financial crisis. The economics of financial crises has argued that bubbles and financial crises are caused by the credit cycle.

Galbraith (1988 [1955]) argued that stock speculation, which relied on bank lending in the 1920s, was the main cause of the banking crises. In addition, he argued that the mutual funds that were in vogue at the time magnified the banking crises by increasing leverage. Koo (2009) further argued that the Great Depression in the U.S. was a balance sheet recession similar to Japan's stagnation since the 1990s and the global financial crisis in 2008. In all cases, people expanded their debt during the bubble period, and conversely, after the bubble burst, cut spending to pay off the debt that increased during the bubble period. This led to a prolonged recession.

Oleny (1999) observed that consumer finance expanded in the U.S. in the 1920s. After stock prices crashed in 1929, households cut spending to avoid a consumer finance collapse. He argued that this was the cause of the sharp decline in consumption during the Great Depression. Gärtner (2013) demonstrated that the recovery in household income, consumption, and other metrics during the post-Depression recovery period since 1933 has been slower in states where households expanded their debt more.

Figure 6 illustrates the U.S. debt and M2 since the 1920s. In the boom of the 1920s, private sector debt increased between 1923 and 1928, and debt increased by more than 30%. Friedman himself identified this as an era of deflation. As a result, the ratio of debt to nominal GDP increased rapidly. Conversely, when a banking crisis occurs, private sector debt plummets. From 1929 to 1933, private sector debt declined by as much as 20%. The Minsky moments of the Great Depression would have been the four banking crises. At this time, U.S. policymakers neglected the banking crises, making the credit

crunch even more severe and collapsing the U.S. economy. As a result, the ratio of debt to GDP rose sharply.

Suppose that in September 2008, U.S. policymakers had permitted the failures of financial institutions. As a result, almost all global financial institutions in the U.S. would have been destroyed. Furthermore, the real economy would have collapsed. Thus, a literal second Great Depression would have occurred.

Bank deposits are now protected by governments. Even if not all deposits are legally protected, governments will enact and protect them with ex post facto laws when a financial crisis intensifies. Therefore, even if the banks were to collapse, the collapse of money would be prevented by deposits becoming de facto government debt. However, the financial crisis would cause a credit crunch, and the collapse of the economy would not be prevented. Furthermore, if deposits are not protected, such as in the U.S. during the Great Depression, they would deteriorate as a result of the financial collapse, which would cause the collapse of money. This perspective suggests that after the global financial crisis emerged, U.S. policymakers prevented a credit crunch and a second Great Depression by bailing out financial institutions <sup>(10)</sup>. The sharp decline in the money stock during the Great Depression was the consequence of a severe credit crunch in the banking sector caused by the banking crises.

Even after the financial crisis subsided, bank lending and the entire private sector's debt remained flat. Owing to the rapid increase in nominal GDP, the ratio of private debt to GDP plummeted from 2.3 to 1.4 in the four years from 1933 to 1937.

Conversely, government debt skyrocketed. Since surpluses and deficits coincided in the total economy, even if the private sector attempted to cut spending, create surpluses, and repay past debt, these attempts would fail unless other sectors ran a deficit. Therefore, under a balance sheet recession, the government must borrow money from the lender of last resort, as argued by Koo (2009, p. 125). After the Great Depression, the U.S. government partially played the role of the borrower of last resort, as Koo claimed. However, since the increase in nominal GDP was larger, government debt declined as a percentage of GDP. In addition, borrowers of the last resort increased the money stock, as shown in the previous section <sup>(11)</sup>. However, after a rapid economic downturn, there is often a temporary rapid recovery (this does not mean the economy will return to normal). Therefore, we believe that a large part of the rapid recovery after the Great Depression was likely the result of the steep decline during the Great Depression.

The collapse of money during the Great Depression resulted from a financial crisis and the subsequent credit crunch. Moreover, even though the private debt leveled off since

the end of the Great Depression, the increase in the money stock was largely due to the government's actions as a borrower of last resort. Unable to comprehend this, Friedman believed that even if the bubble burst, if the monetary policy could prevent the collapse of money, a situation like the Great Depression would never occur again <sup>(12)</sup>.

Conclusion: Is the Theory of the Great Depression possible without a Financial Crisis?

The global financial crisis was theoretically impossible according to Friedman's theory of the Great Depression. His policy recommendations did not help prevent or resolve the crisis. In addition, after the global financial crisis, central banks increased the monetary base, but this did not increase the money stock. Conversely, interest rates declined to almost zero or below. The global financial crisis not only questioned Friedman's macroeconomics and monetary policy theory but also his theory of the Great Depression. In particular, his "mop-up" strategy after the bubble burst encouraged the expansion of mortgages that could not be repaid without creating the housing bubble and magnified the scale of the subsequent financial crisis.

Kindleberger (2000, pp. 64–68), in his *Manias, Panics, and Crashes*, pointed out that the idea of the financial instability hypothesis dates back to 19th-century economics. However, he stated that the Great Depression has buried the long-standing tradition of the financial instability hypothesis. In explaining the Great Depression, monetarists have focused on money, Keynesians (specifically, Temin) have focused on spending, and both have ignored financial instability <sup>(13)</sup>. The global financial crisis revived this seemingly extinct financial instability hypothesis.

In the first place, the collapse of money during the Great Depression was only the result of the banking crises. However, Friedman made the role of the banking crises during the Great Depression negligible by arguing that the money collapse and banking crises could be prevented by the Federal Reserve's open market purchases. He underestimated the role of fiscal policy because he could not understand that the increase in money stock after the Great Depression was largely due to the government's action as a borrower of last resort. It is the global financial crisis that revealed the distortions of Friedman's theory of the Great Depression.

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Economy on August 27, 2022, and International Conference on September 19, 2022. We thank Professor Emeritus Ryuzo Kuroki (Rikkyo University), Professor Atsuyuki Naito (Otsuki Junior College), Professor Susumu Egashira (Otaru University of Commerce), Professor Tokutaro Shibata (Teikyo University Graduate School) and other participants for their comments. Any remaining errors are my own.

#### Notes

(1) Macroeconomics and monetary policy based on macroeconomics since the “counter-revolution” of the 1970s have been strongly influenced by Friedman.

(2) Friedman and Bernanke outlined that the Federal Reserve’s pricking of the bubble during the Great Depression of 1929 was a mistake. Regarding the long-term stagnation of Japan since the 1990s, Bernanke stated that it was wrong for the BOJ to have burst the bubble. However, the Great Depression and the long-term stagnation of Japan may have resulted from too much expansion of Ponzi finance, which could not be repaid without the bubble. However, Friedman and Bernanke did not consider this possibility at all. Therefore, Bernanke and the Federal Reserve ignored Ponzi finance until it was too late, triggering the global financial crisis.

(3) Most current macroeconomic models are New Keynesian. It is assumed that the economy will quickly return to full employment levels, at least as long as deflation is avoided. Under this assumption, after the economy has contracted sharply due to external shocks, it will recover sharply. In contrast, household debt is not considered in the model. Therefore, cutting spending for households to pay off their debt is simply ignored. It is because of the flaws in these models that the Federal Reserve and others predicted a V-shaped recovery of the economy after the global financial crisis. Conversely, the stock flow consistency model developed by Godley explicitly incorporated sectoral debt into the model; therefore, Godley et al. (2009) correctly predicted an L-shaped recovery.

In addition, it is necessary to consider the experience of Japan. In the early 1990s, after the bursting of the Japanese bubble, Miyazaki (1993) was among the first to argue that a compound recession accompanied by debt adjustment would delay economic recovery. Later, Koo (2007, 2009) also argued that under a balance sheet recession, not only would the recovery of the economy be delayed by debt repayment, but monetary policy would also be ineffective. In 2009, based on Japan’s experience, he further argued that Bernanke’s interest rate cuts would not have the desired effect (Koo, 2009, p. 236). However, Koo emphasized that the reason for the lack of loan growth is mainly a problem on the part of borrowers. Qualitatively, in Japan, economists focusing on debt accurately

predicted that the economic recovery would be prolonged.

(4) Bernanke praised Friedman's theory of the Great Depression, and he (Bernanke, 2000a) further argued that the banking crises created a credit crunch that exacerbated the Great Depression. If we favorably interpret that non-bank financial institutions and financial markets will create a credit crunch as well as banks, his theory of the Great Depression and 2008 financial institution bailouts will be consistent.

(5) Between 1936 and 1937, excess reserves decreased due to the rapid increases in the legal reserve ratio.

(6) The fact that government bond issuance increases the money stock can be shown by a simple model as follows.

In the beginning, suppose that the government issues  $\Delta B$  bonds. Banks purchase  $\Delta B_B$  and households purchase  $\Delta B_H$ . The demand for government bonds by banks and households is an increasing function of interest rates of government bonds,  $i$ . If the supply and demand of the government bond market coincide,

$$\Delta B = \Delta B_B (i) + \Delta B_H (i) . \quad (1)$$

If the government spends the borrowed funds, which are received by households, households then hold this money in cash,  $\Delta C$ , or bank deposits,  $\Delta D$ , and government bonds,  $\Delta B_H$ . Therefore,

$$\Delta B = \Delta C + \Delta D + \Delta B_H. \quad (2)$$

Banks initially hold excess reserves,  $R$ . Banks spend on the purchase of government bonds and accumulate reserves as deposits increase. Eventually, the bank's excess reserves are as follows. As the excess reserve must be zero or positive,

$$R - \Delta B_B - r\Delta D \geq 0, \quad r: \text{legal reserve rate of deposits.} \quad (3)$$

Now, suppose that Equation (3) holds, from Equations (1) and (2), we then derive:

$$C + D = \Delta B_H. \quad (4)$$

In other words, when banks purchase government bonds, households' deposits increase accordingly. Especially when interest rates on government bonds are close to zero, households prefer deposits to government bonds. Furthermore, most of the issued government bonds will be purchased by banks, and the increase in money will be expected to increase accordingly.

(7) Hattori (2005, pp. 50–53) indicates that from the 1990s to 2005, the Japanese government's deficit fiscal policy expanded the money stock through banks purchasing government debt.

(8) Post-Keynesians posit the theory of endogenous money supply. This idea suggests that the money stock is determined by bank lending. We believe that it is not only bank lending that expands money but also credit in the consolidated sector, such as government bonds. We also believe that even if the monetary base increases, the money stock will not increase, as shown by our study, supporting the endogenous money supply theory. Moreover, the endogenous money supply theory should be restructured based on this empirical fact (for the theory of endogenous money supply, see Naito, 2011; Rochon and Rossi, eds., 2017).

(9) Koo (2007, pp. 39–42; 2009, pp. 90–113) reported that government bond issuance has expanded the money stocks in Japan since the 1990s and in the U.S. in the 1930s. Moreover, like us, Koo argued that it was fiscal policy, not monetary policy, that solved the Great Depression.

(10) Koo (2009, pp. 96–104) argued that the main reason for the decline in bank lending was not on the lenders' side, such as the banking crises or credit crunch, but rather because borrowers were reducing excess debt. As a basis for this, he cited the National Industrial Conference Board survey in 1932. According to the survey, out of 3,438 manufacturers, only 466 said they had difficulty negotiating with banks, and most were small businesses and medium-sized companies (Koo, 2009, p. 99). However, even if a small number of companies were struggling with cash flow, if their production stopped, it would affect any related companies. In this way, the credit crunch had a cumulative effect.

When the banking crises subsided in March 1933, the past sharp decline in lending subsided. Therefore, we believe that the banking crises were an important cause of the sharp decline in lending during the Great Depression. However, even after the financial crisis subsided, lending continued to decline for some time, and the pace has been moderate even after beginning to increase. Therefore, I agree with Koo's argument that the demand for borrowing is important.

(11) As mentioned earlier, Friedman (2005) compared the bursts of three bubbles in the 1920s and 1990s in the U.S. with that in the 1980s in Japan, arguing that even if a bubble bursts, economic deterioration can be prevented by increasing the money stock. However, a correlation with the economic situation after the bursting of a bubble also exists in bank lending. In other words, in the U.S. during the Great Depression, bank lending plummeted due to the banking crises. In Japan, the rate of increase in bank lending declined sharply after the bursting of the bubble and became negative after the financial crisis in 1997. Conversely, in the U.S., after the bursting of the IT bubble, a housing bubble occurred, further increasing the rate of bank lending. However, after the financial crisis in 2008, bank lending declined. After that, even if bank lending were to start increasing, it would not reach the past peak, even in 2019. Lending soared in 2020 because companies and individuals struggling with cash flow resulting from the COVID-19 crisis borrowed large amounts.

Moreover, these differences in lending fluctuations would create differences in changes in the money stock unless government debt completely offset these effects. In light of this, we believe that lending has been important and has affected the money stock and the real economy.

(12) Regarding the Great Depression, some argue that the fetters of the gold standard prevented the possible recovery from the crisis (e.g., Eichengreen, 1992). We do not necessarily deny this claim in the sense that a major event such as the Great Depression cannot be fully explained by a single factor. However, while the U.S. did not adopt the gold standard or fixed exchange rate system, a financial crisis comparable to the Great Depression occurred in 2008. Had the U.S. policymakers allowed financial institutions to fail, Wall Street would have been destroyed, and a second Great Depression would have occurred under the floating exchange rate system. In light of this, we believe that the banking crises and the fact that the U.S. policymakers during the Great Depression condoned the failure of financial institutions—causing a historic credit crunch—were of incomparable importance to the fetters of the gold standard or the failure of monetary policy.

(13) Minsky (1976), in his review of Temin's "*Did Monetary Forces Cause the Great Depression?*" rejected both monetarist and Keynesian explanations of the Great Depression for the same reasons as Kindleberger (2000).

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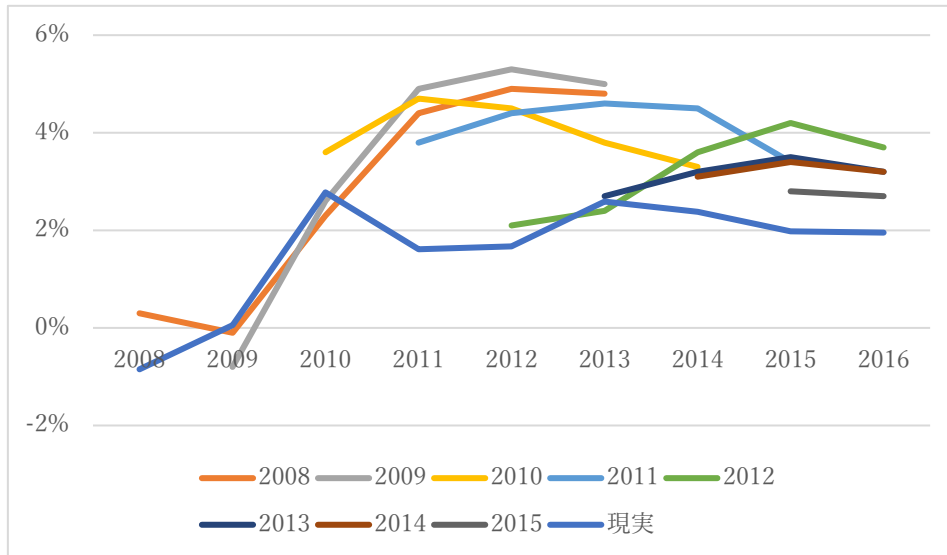
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**Figure 1: Forecasts of the U.S. Growth by the FOMC Staff and Actual Growth Rates after the Global Financial Crisis**

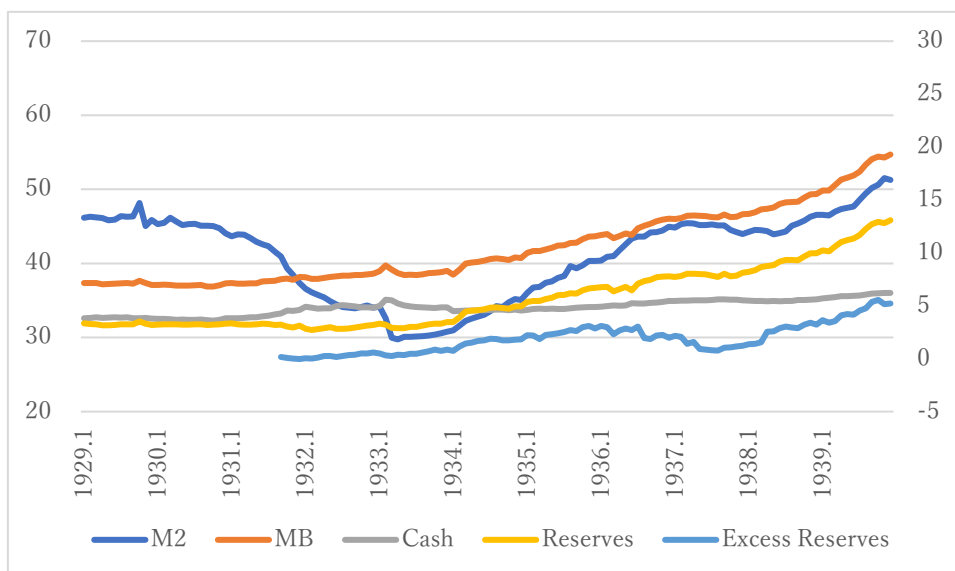


Source: Congressional Budget Office (2021), Bureau of Economic Analysis (2021).

Note 1: Growth rate is in the same period as the previous year. Forecasts from the FOMC staff are those of the baseline. The forecast for 2008 is for October after the bankruptcy of Lehman Brothers, and the rest are for the month of January in the indicated years.

Note 2: Real GDP data is revised frequently. The data are based on the final (third) reports for the fourth quarters of indicated years.

**Figure 2: Monetary Indicators of the U.S. during the Great Depression (January 1929 to December 1939)**

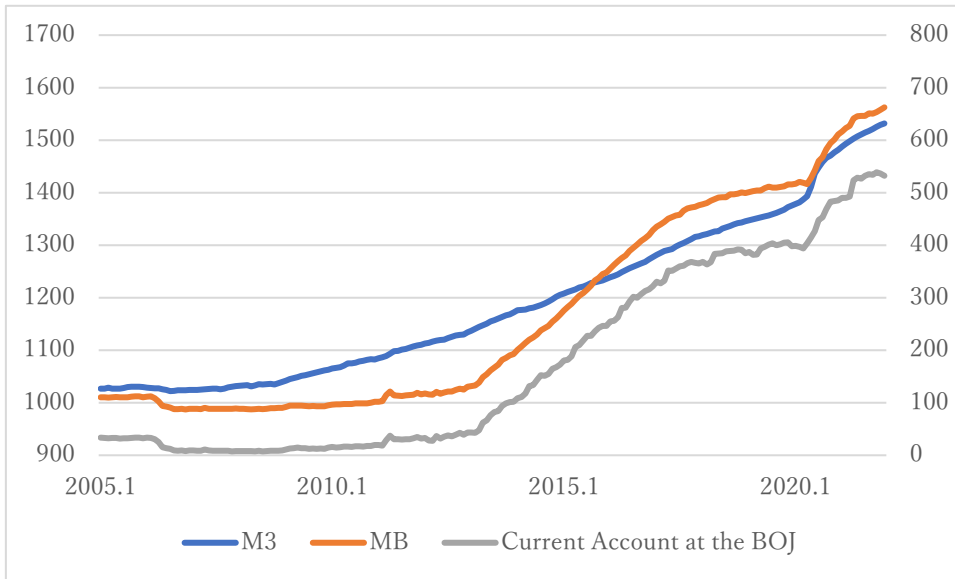


Unit: Billion dollars

Source: Friedman and Schwartz (1963), Board of Governors of the Federal Reserve System (1943).

Note: M2 is indicated on the right-hand side axis, while others are indicated on the left-hand side.

**Figure 3: M3 and the monetary base in Japan (January 2005 to December 2021)**



Unit: Trillion yen

Source: Bank of Japan (2022)

Note 1: M3 is indicated on the right-hand side axis, while others are indicated on the left-hand side.

Note 2: M3 and the monetary base are seasonally adjusted.

**Table 1 Monetary Survey**

Central bank

Assets	Debts	
Net Foreign Assets	Currency in Circulation	Monetary Base
Claims on Central Government	Current Accounts	
Claims on Depository Institutions	Liabilities to Central Government	
Claims on Other Financial Institutions		
Claims on Other Sectors	Other Liabilities	

Depository Institutions

Assets	Debts
Net Foreign Assets	Deposit Money
Claims on Central Government	Quasi-Currency, CD
Claims on Central Bank	Liabilities to Central Government
Claims on Other Financial Institutions	
Credit for Local Governments	Liabilities to Central Bank
Credit for Other Sectors	Other Liabilities

Consolidated Sector

Assets	Debts	
Net External Assets	Cash Currency	Money Stock
Net Claims on Central Government	Deposit Currency	
Credit for Other Financial Institutions	Quasi-Currency, CD	
Credit for Local Governments	Other Liabilities	
Credit for Other Sectors		
Credit from Central Banks	Credit from Central Banks	
Credit to Central Banks	Credit to Central Banks	



## Table 2 Process of Increasing Money

A: Increase in Open Market Purchases with Bank Lending (Money Multiplier)

### Central Bank

Assets		Debts	
Government Bonds	100	Cash	90
		Current Accounts	10

### Depository Institutions

Assets		Debts	
Government Bonds	100	Cash	90
Loans	990	Deposits	900

### Consolidated Tables

Assets		Debts	
Loans	990	Cash	90
		Deposits	900

B: Open market purchase only

### Central Bank

Assets		Debts	
Government Bonds	100	Current Accounts	100

### Depository Institutions

Assets		Debts	
Current Accounts	100	Government Bonds	100

### Consolidated Sector

Assets		Debts	
Current Accounts	100	Current Accounts	100

C: Direct Underwriting of Government Bonds by the Central Bank

Central Bank

Assets		Debts	
Government Bonds	100	Cash	10
		Current Accounts	90

Depository Institutions

Assets		Debts	
Current Accounts	90	Deposits	90

Consolidated Tables

Assets		Debts	
Government Bonds	100	Cash	10
		Deposits	90
Current Accounts	90	Current Accounts	90

D: Issuance of Government Bonds and Purchases by Depository Institutions

Central Bank

Assets		Debts	
Current Accounts	90	Deposits	90

Depository Organizations

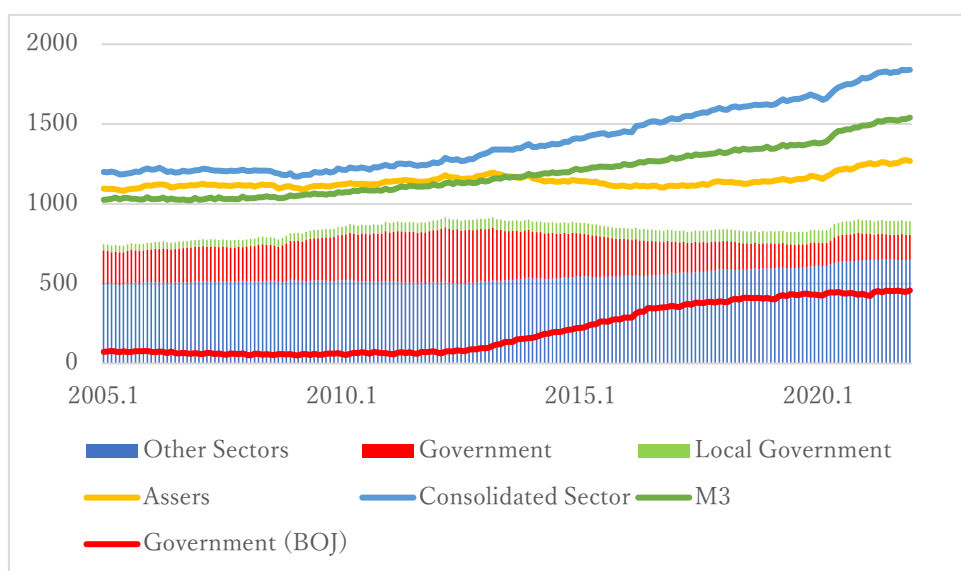
Assets		Debts	
Government Bonds	100	Cash	10
		Current Accounts	90

Consolidated Tables

Assets		Debts	
Government Bonds	100	Cash	10
		Deposits	90
Current Accounts	-90	Current Accounts	-90

Unit: Billion Yen

**Figure 4: The Relationship between M3 and Credits of the BOJ and Deposit Institutions in Japan (January 2005 to December 2021)**

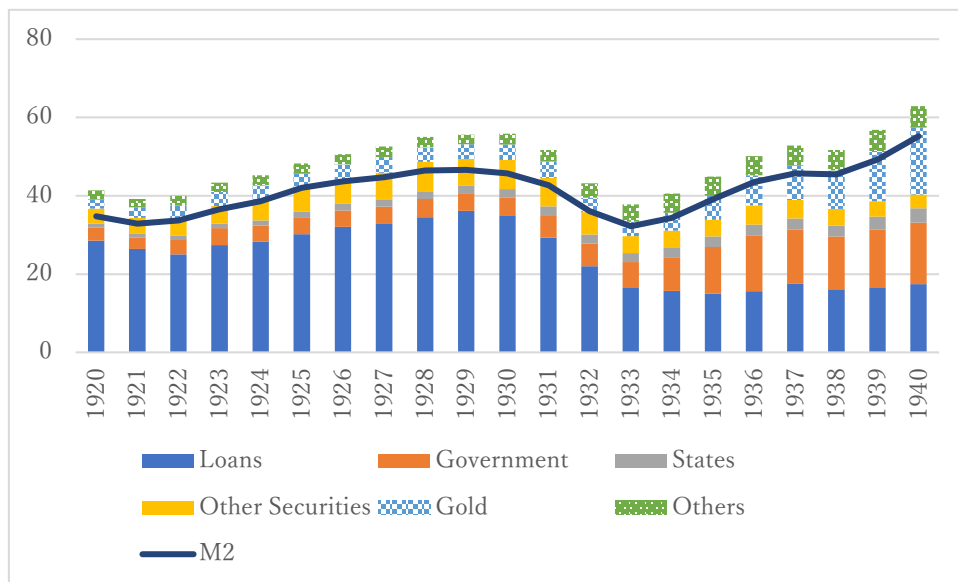


Unit: Trillion yen

Source: Bank of Japan (2022).

Note: “Government” refers to the central government. “Other sectors,” “government,” and “local governments” show the claims of depository institutions on each. “Government (BOJ)” shows those of the BOJ. “Consolidated sector” shows the total assets of the consolidated sector. “Other sectors” incorporate claims excluding those on financial institutions, general governments, and foreigners. Credits to the central government are net credits deducting credits from the central government.

**Figure 5: The Relationship Between M2 and Assets of the Monetary Authorities and Banks in the U. S. (1920 to 1940)**

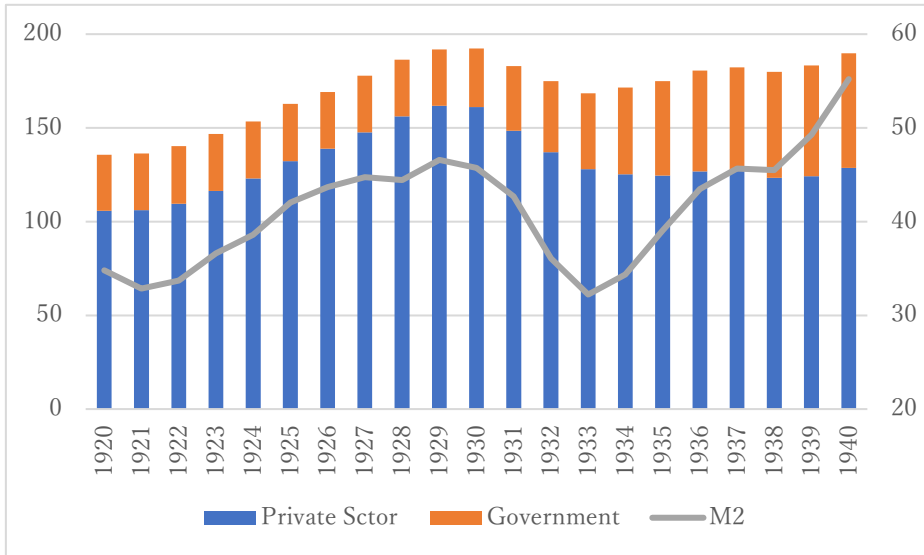


Unit: Billion dollars

Source: Carter et al., eds. (2006).

Note: “Government” means government bonds deducting credit from the federal government. “States” means bonds of states and municipals. “Others” are deducting credits from the federal government. The bar chart shows the assets of banks and monetary authorities. Of these, loans, “government bonds,” “state,” and “other securities” represent the assets of banks; “Gold,” and “Others” refer to the assets of the monetary authorities.

**Figure 6: Debts and M2 in the U.S. (1920 to 1940)**



Unit: Billion dollars

Source: Carter et al., eds. (2006).

Note: M2 is indicated on the right-hand side axis, while others are indicated on the left-hand side.