SOMETIMES THE HORSE WILL DRINK AND SOMETIMES IT WON'T: MONETIZING THE RECOVERIES FROM THE GREAT DEPRESSION AND THE GREAT RECESSION

Kenneth Weiher
Department of Economics
University of Texas at San Antonio
ken.weiher@utsa.edu

Despite the extraordinary and unprecedented actions taken by the Federal Reserve from 2008 to 2012, the economy was unable to mount a strong economic recovery because banks were not lending the $1.6 trillion in excess reserves that the Fed had created. The economy was caught in a predicament reminiscent of the 1930s. Back then, in the face of near-zero interest rates and credit-crunch conditions that rivaled or exceeded in severity those in 2008-12, the recovery was comparatively robust. What made that 1930s recovery so unique was that it was at least partly fueled by rapid money supply growth, which resulted not from bank lending but from an inflow of gold. This paper, in an effort to better understand both periods, reviews Fed policy in recent years, looks back at how money fueled the recovery in the 1930s, and examines what really caused the money supply to grow in the 1930s. It concludes that in times of near-zero interest rate conditions, it may be how and where money is injected into the economy that determines the efficacy of monetary policy and potential strength of the economic recovery.

By 2012, the US economy sat in a perplexing doldrums. The recovery from the "Great Recession" was tepid at best, with Gross Domestic Product (GDP) growth rates consistently below average and well short of what is needed to return the economy to full employment. What was most frustrating about the economy's poor performance was that it was coming in the face of

extraordinary measures taken by the Federal Reserve to spur economic expansion by adding previously unheard of quantities of reserves to the monetary base. Through its expansionary programs – including both phases one and two of its heralded "quantitative easing" (QE) programs on top of the exceptionally large measures to add liquidity taken at the height of the emergency in 2008 – the Fed had tripled the monetary base in a little less than three years. Yet, nominal GDP had risen less than 12 percent and had settled into a sluggish four percent annual growth rate, while output was unable to grow faster than two percent per year. Banks were not lending, borrowers were not borrowing, and the money supply had not grown at a pace consistent with a recovery. Never had a horse been led to so much water and drunk so little. By the fall of 2012, the Fed had embarked on a third phase of quantitative easing. With interest rates near zero, monetary policy was caught in liquidity trap conditions of proportions not spoken of since the Great Depression and reminiscent of Japan in more recent years.

Whether or not the economy actually experienced a liquidity trap in the 1930s has been a topic of much debate (Christopher Hanes, 2006). Neither John Maynard Keynes (1936) in the 1930s nor Milton Friedman and Anna Schwartz (1963) in the 1960s believed trap conditions held in the 1930s, but Japan's experiences at the turn of the millennium triggered a surge of curiosity about market conditions when short-term interest rates approach zero (Paul Krugman, 1998, 2000). Friedman and Schwartz contended that a lack of bank reserves caused the contraction from 1930 to 1933, and that the growth of bank reserves was the basis of the recovery from 1933 to 1940. Their work laid the groundwork for the contention that the recovery of the 1930s was fueled by money supply growth more than anything else. This monetary explanation for the recovery was bolstered by the work of Christina Romer (1992), who makes the case that the monetary base, driven by gold imports, almost tripled while the money supply rose 87 percent. The Fed itself had little to do with this 1930s chapter of "quantitative easing;" rather the Treasury must get the credit (Romer, 1992; Richard Anderson, 2010). The massive inflow of gold created high-powered money and spurred the growth in the money supply. In other words, when water once again was restored to the trough starting in 1933, it appears that the horse drank it, and the economy expanded rapidly.

But it turns out that the rapid growth of the money supply in the recovery phase of the 1930s was not the product of bank loans. This surprising detail has been brought to our attention by Charles Calomiris (2011, p. 6). The data do indeed show that the money supply grew without the help of bank loans. Banks were just as reluctant to lend money in the 1930s as in the 2007-11 period, yet the money supply grew anyway. The horse drank from a different trough from what we are accustomed to seeing, and that appears to have made all the difference in the world.

The causes and consequences of the Great Depression and Great Recession have so much in common that many parallels have naturally been drawn. In fact, Fed Chairman, Ben Bernanke's (1995) unique knowledge of the earlier contraction guided him in dealing with the recent one. His efforts to flood the market with liquidity likely saved the economy from a more severe collapse, such as that experienced in the Great Depression. However, his efforts to hasten the recent recovery with the kinds of money supply growth seen in the later 1930s were not so successful. He must wonder why the horse at his trough refused so intractably to drink, while the horse of the 1930s appears to have imbibed so readily. If the money supply was able to grow back in the 1930s, when financial conditions could hardly have been less conducive to bank lending, what was stopping it eighty years later? The unique nature of the source of the money supply growth in the 1930s provides insight into why it matters a great deal how a recovery is monetized – that is, where the trough is located.

The purpose of this paper is to examine closely the monetary explanation for the recovery phase of the Great Depression to better understand how gold and money contributed to that recovery. As a byproduct, the 1930s experience may shed light on why the Fed's efforts to spur the recovery out of the Great Recession with money supply growth were so unsuccessful in comparison to the 1930s when money supply growth apparently fueled a recovery like none other. Section one will lay out the facts concerning the policies taken by the Bernanke Fed as well as how the economy has to date been unable to overcome the "headwinds" so often mentioned by the Fed. Section two will look back at the recovery of the 1930s, consider the several theories for the source of the recovery, and look in detail at how gold appears to have triggered the money supply growth and vigorous economic recovery. Section three will then look more closely at how the money supply actually grew in

the 1930s in spite of severe credit-crunch – if not liquidity-trap – conditions. Finally, Section four will consider what this new perspective regarding the quantitative easing of the 1930s tells us about both recoveries and how the experiences of both inform us about the other.

Responding to the Financial Crisis

At the time that the U.S. financial crisis accelerated in the fall of 2008, Federal Reserve Board Chairman, Ben Bernanke, had already been busy for several months trying to prevent a replay of what happened in the early 1930s, when a financial panic precipitated a major economic contraction. As a firm believer in the monetary explanation for the Great Contraction, he was determined not to repeat the Fed's errors of inaction, errors that allowed the money supply to fall precipitously from 1930 to 1933 and turned a garden-variety recession into the Great Depression. While the actions taken by the Fed in the months that followed September 2008 have been criticized both for being too conservative and too expansionary by various observers, one cannot say the Fed was inactive. In multiple stages, the Fed used its ability to purchase securities in the open market in an unprecedented manner in terms of both the quantity and variety of assets it acquired. By the summer of 2011, the Fed's balance sheet had ballooned from a bit over $800 billion in assets to close to $2,800 billion. Along the way, the composition of the Fed's assets changed as never before. All of these actions were designed to provide the financial markets with desperately needed liquidity to a) relieve specific markets, b) lower targeted interest rates, and c) increase the overall quantity of funds available. While we can never be sure what the counterfactual would have been had the Fed not been so active, most informed observers give Bernanke and the Fed considerable credit for staving off what surely would have been a far more severe financial crisis and recession had they not moved so aggressively. However, by 2012, these policies had failed to bring forth anywhere near the increase in aggregate demand that one would have wanted or expected. Despite the massive addition to the monetary base, the money supply growth was modest. This was good news for those who feared inflation, but bad news for the recovery. Let us examine what the Fed did and how that affected the economy.

Up until September 2008, the Fed followed a strategy of providing targeted liquidity without allowing the monetary base to grow at all. Rescue

operations and lending to financial institutions were offset by reductions in the Fed's holding of Treasury securities. Thus, the Fed sterilized the funds added to the market for the rescue operations by withdrawing an equal amount of funds through the sale of Treasury securities. One could argue, as David Wheelock (2010) and Robert Hetzel (2012, p. 305) have, that this conservative, credit-policy approach during the first year of the financial crisis was inadequate. Had the Fed been more aggressive during this period in adding to the total supply of funds to support nominal GDP growth, instead of simply rearranging funds, the ensuing financial crisis and consequent recession could have been less severe – a counterfactual in the opposite direction. But that is a debate for another time. What ensued in the last four months of 2008 was a complete change of strategy.

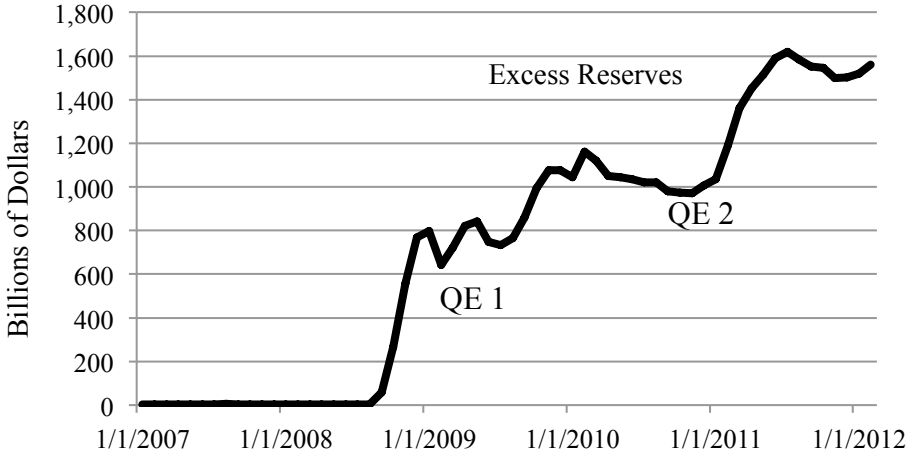

Figure 1. Excess Reserves (2007-11)
Source: Federal Reserve Bank of St. Louis.

The Fed initiated a massive infusion of reserves into the financial system, acquiring quantities and qualities of assets that were previously unheard of for the Fed. Their assets leapt from $800 billion in value to $2,200 billion by the end of the year. The majority of this came in the form of lending to financial institutions (both domestic and foreign) and support for the commercial paper market. As a result, the monetary base doubled from $850 billion to $1,775 billion. Almost all of these funds ended up in bank reserves, as excess reserves vaulted from almost nothing to $800 billion, as can be seen in Figure

1. Another result of the infusion of these additional funds was that the federal funds rate was pushed to near zero percent.

This massive infusion predated the policy that was later to be known as "quantitative easing." Since the Fed had pushed the federal funds rate as low as it could go, further easing would have to be directed at something other than lowering short-term interest rates. The Fed announced it would begin a new strategy in March 2009, later to be known as QE1, directed at pushing down longer-term rates, such as mortgage rates. For the next year, the Fed essentially supported the entire mortgage market by purchasing mortgage-backed securities (Wheelock, 2010, p. 96). It accumulated $1 trillion in such assets by March 2010. During the same period the Fed reduced its lending to financial institutions by a greater amount, withdrew most credit market support, and began purchasing long-term Treasury securities. The net result of QE1 was a very big change in the composition of the Fed's holdings but little net change in total Fed assets. During the second half of 2009, the effects of QE1 on the monetary base and excess reserves slowly began to appear. Both ended up growing by an additional $200 billion by the time QE1 wound down in the spring of 2010.

While QE1 may have helped stabilize the mortgage market and provide additional liquidity, it did little to spur investment spending. In an effort to push down long-term interest rates further, the Fed implemented what became known as QE2 in November of 2010. Without any other offsetting transactions this time, the Fed proceeded to increase it holding of long-term Treasury securities by just short of $1 trillion. As a result, the monetary base rose by $700 billion and excess reserves increased by $600 billion. Thus, QE2 was far more expansionary than QE1 in terms of its net impact on the monetary base and reserves. By the end of QE2 the total results of Fed policy were quite dramatic. If one combines the three stages of Fed action from September 2008 to June 2011 – that is, the nameless first stage in the fall of 2008, QE1 in 2009-10, and QE2 in 2011 – the total increases in the monetary base and excess reserves, respectively, were $1.9 trillion and $1.6 trillion. By any measure, this kind of Fed-engineered addition to bank reserves was unprecedented.

When one looks at the trajectory for the excess reserves line on Figure 1, one cannot help but be struck by how unusual this pattern is. Until the fall of 2008, save for occasional spikes such as after 9/11, banks generally held less

than $2 billion in excess reserves system-wide. By the end of 2009, excess reserves rocketed to over $700 in the first stage, past $1,100 billion with QE1, and to $1,600 by the end of QE2. Part of the build-up in excess reserves can be explained by the implementation of interest payments by the Fed on bank reserves that were started on October 1, 2008. And as long as the Fed continues to pay interest, excess reserves will likely not return to their pre-2008 miniscule levels. While the payment of interest on reserves provided banks with an incentive to hold more reserves than before, it was the banks' failure to lend the newly-created reserves that caused them to accumulate. In fact, as Figure 2 illustrates, commercial and industrial bank lending actually peaked in the fall of 2008 and declined steadily until mid-2010. The Fed created over $1.6 trillion dollars in high-powered money, but the banks were not lending, and customers were not borrowing. Indeed, it was the banks' reluctance to lend the reserves that the Fed created in the first stage of easing that prompted the Fed to initiate both QE1 and QE2. Excess reserves do not propel aggregate demand upward unless they are converted into money through bank lending, and that was simply not happening.

This brings us to the impact of Fed policy on the money supply. It is difficult to find any mention of the money supply in Fed releases or modern monetary theory, but it is what happens to the money supply that matters with respect to aggregate demand, not the monetary base. In spite of all the emphasis on interest rates – the federal funds rate, the discount rate, the rate paid by the Fed on reserves, etc. – if reserves are not lent, the money supply does not grow, and aggregate demand is left unchanged. Excess reserves are not money; they are only potential money. Many an analyst speaks of the Fed's excessively "printing money" with its three stages of monetary base expansion. Aside from the detail that the Fed does not even print currency, this colloquial representation of the actual impact of Fed policy fails to recognize that adding reserves through the purchase of assets (from Treasury Bills to toxic assets) may be like printing reserves, but it is not like printing money if banks are not lending.

This is particularly the case during the three-year period we are viewing. Even while the economic recovery was languishing due to a lack of aggregate demand, many observers worried out loud about the rampant inflation this supposed wholesale "printing of money" would cause. It is reasonable to worry about how those reserves could set off future inflation if and when the

banking system decides to lend them. That is why there is so much discussion about the Fed's "exit strategy" – that is, its plan to either remove or neutralize those reserves, when lending and spending do pick up. But reserves cannot cause inflation until they are lent.

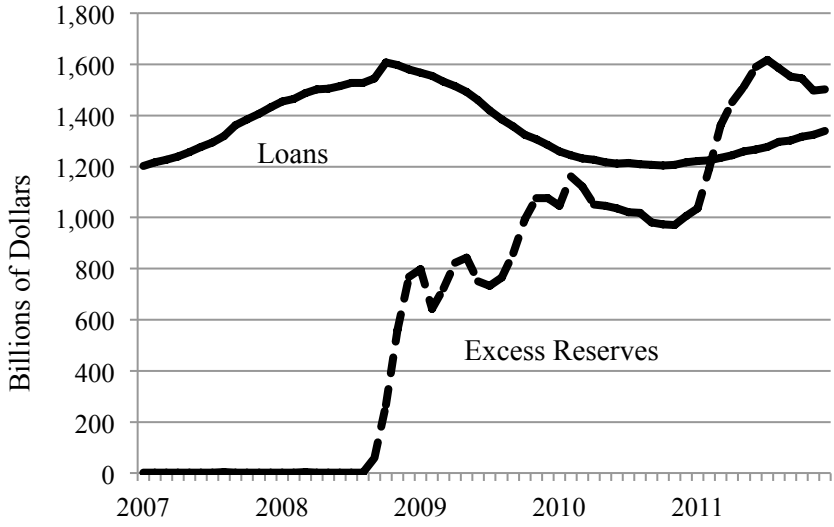

Figure 2. Commercial and Industrial Loans and Excess Reserves (2007-11)
Source: Federal Reserve Bank of St. Louis.

Long ago the Fed stopped talking about the money supply, when it no longer felt comfortable with defining or measuring what the money supply actually is, and it lost faith in the stability of money demand. Nevertheless, the money supply – however it is measured and defined – and the velocity of money, taken together, still determine the level of aggregate demand. Financial innovation has not repealed the Equation of Exchange; it has simply ruled out using the equation as a practicable policy tool. If the Fed cannot comfortably measure the money supply, it must target something else, like interest rates. However, interest rate changes only alter aggregate demand if they effect changes in lending and spending. From the fall of 2008 through 2011, it is clear that aggregate demand was not being lifted very far by the tsunami of reserve creation. Nominal GDP growth never exceeded a five percent annual rate. That means neither did aggregate demand growth. While the monetary base grew at an average rate of 100 percent for the two years

from the fall 2008, aggregate demand grew at less than a 5 percent annual rate. If quantitative easing was alternatively meant to spur spending by changing inflationary expectations or by causing people to rearrange their asset portfolios in a way that would channel funds to greater spending, particularly by businesses, it was not working. Velocity clearly was not on the rise.

Let us look at what M2 did. Its annual growth rate never exceeded 11 percent, and it averaged six percent. This is a far cry from the 100 percent growth rate in the monetary base. Figure 3 demonstrates the connections among the monetary base, the M2 money supply, and nominal GDP. The three climbed in tight formation until the 1990s, when the difficulties in measuring the money supply created a separation between the monetary base and the other two. The gap between the monetary base and the other two was minor until 2008 when the growth in the monetary base left the other two far behind. Clearly the unprecedented growths of excess reserves and the monetary base did not translate into money supply and aggregate demand growth. Instead those reserves stayed parked in the banks, fueling neither money supply nor aggregate demand growth.

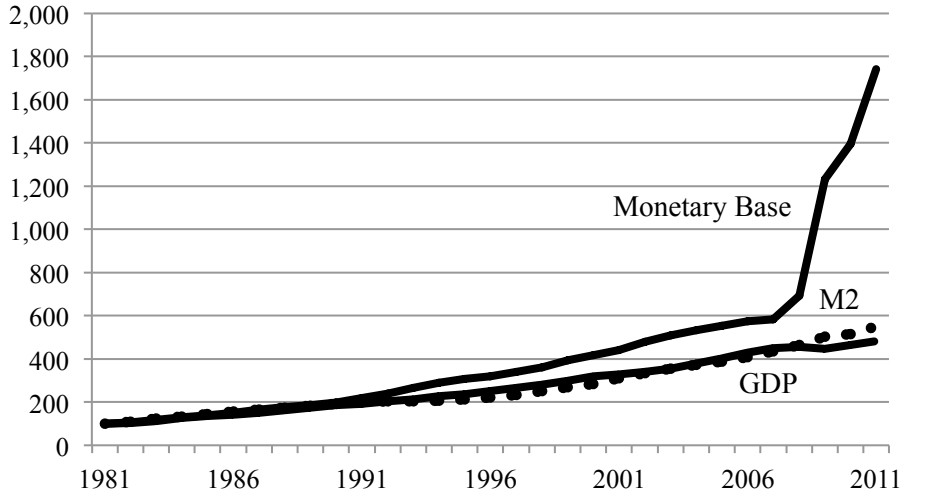

Figure 3. Monetary Base, M2, and GDP (1981-2011), rebased 1981 = 100 (Billions of Dollars)

Source: Federal Reserve Bank of St. Louis.

While the earning of interest on reserves can account for a portion of banks' increased desire to hold these reserves, a bank would normally not choose to earn so little on such a large portion of its assets. A far more profitable, albeit also far more risky, outlet for these reserves would be commercial loans. But as Figure 2 showed, commercial lending stagnated in spite of the huge injection of reserves into the system. Under the assumption that bank demand for reserves would rise with the worsening of the financial crisis, the Fed wanted to be sure that it supplied all the reserves banks wanted and more. This had been the big mistake made by the Fed in the early 1930s. At that time, the Fed misinterpreted the accumulation of excess reserves that was piling up in banks to be a signal of plentiful liquidity. In reality, it was a sign that banks, desperate to protect their liquidity position, needed more reserves to weather the storm. Had the Fed moved aggressively to add reserves, contended Friedman and Schwartz (1963), they could have prevented the decline in the money supply that pushed aggregate demand down so far. Mr. Bernanke would not let that mistake be repeated on his watch. He pursued a strategy of flooding the banks with reserves until they truly held an excess of excess reserves in the hope that once their vaults overflowed, they would be much more inclined to lend. Unfortunately, banks did not; the banking system fell into a sort of reserves liquidity trap. Every addition to reserves was simply absorbed by the banking system. With short-term interest rates as low as they could go, the reserve supply curve merely shifted farther and farther to the right along a perfectly elastic reserve demand curve. The reserves trough was full, but very little drinking was occurring.

The 1930s Expansion

One cannot discuss Fed policy during the recent financial crisis without drawing parallels to the Great Depression. One such parallel that is worth exploring here is the possible role of monetary growth in the recovery in the 1930s after the economy bottomed out in 1933. There is a variety of views of what propelled the recovery phases of the 1930s – that is, 1933-36 and 1938-40. The traditional view of Great Depression history that still pervades history books and media accounts tends to give most of the credit for the economic growth to the New Deal and World War II spending, respectively. That myth was primarily put to rest among economists by Cary Brown's (1956) pivotal work.

Among most economic historians, the New Deal holds less than hero status; in fact, some view it as the culprit in explaining how long it took the economy to return to full employment. First Richard Vedder and Lowell Gallaway (1993) and then Harold Cole and Lee Ohanian (1999, 2004) demonstrated how New Deal policies and their impacts on a number of variables including wages, prices, and productivity explain the persistently-high unemployment during the recovery phases and the inability of the economy to return to full employment sooner. However, while the portion of New Deal policies that revolved around the NIRA, the Wagner Act, and other intrusions into the market have been criticized, Roosevelt's "policy regime change" has been given credit for launching and propelling the recovery. The works of Gauti Eggertsson (2008) and Peter Temin and Barry Wigmore (1990) have built on the contributions of Robert Lucas and Leonard Rapping (1972) and Thomas Sargent (1983) to argue that Roosevelt's bold abandonment of the Gold Standard, devaluation of the dollar, commitment to reflation policy, and fiscal policy shift sent a message to the market that triggered a reversal of expectations. This creation of inflationary expectations, where the opposite had ruled for three years, is given credit for turning the economy around as early as the summer of 1933. Were John Maynard Keynes still alive, he might be surprised to learn that expectations were so positive after the regime change in 1933. He had anything but great expectations when he penned his open letter to Roosevelt in the *New York Times* on New Year's Eve of 1933. He did not see a profound regime change when it came to the reflation policy wrapped up in the abandonment of the Gold Standard and devaluation of the dollar. In addition, he foresaw nothing but trouble in the NIRA and other reform policies that raised wages and prices. Keynes, an acknowledged successful reader of the animal instincts in the real and financial markets, apparently did not read that wave of positive expectations more recent writers have. Had he seen such a change we must assume that he would not have felt the need to go to such lengths to publicly communicate to Roosevelt and the public that the economy was starving for increases in aggregate demand. Keynes did not see anywhere in Roosevelt's recovery policies a source for the reversal in aggregate demand that the economy so desperately required.

These and other demand-side conversations miss the point according to Cole and Ohanian (2011). They entirely rule out aggregate demand as the

source of the recovery – plagued as it was by New Deal policies – and give all of the credit for the recovery phases to productivity increases on the supply side. They target the summer of 1932 as the beginning of that recovery. By doing so, they try to establish that the recovery predated the demand-side policy changes associated with Roosevelt. While the economy did bottom out in 1932, the open market operations of the summer of 1932 are often credited with triggering a nascent recovery that lost momentum when the purchases were halted. In Fact, Richard Anderson (2010) refers to the Fed's Treasury purchases in 1932, as well as money supply increases after 1933 as "The First Quantitative Easing." That is consistent with a demand-side determination. Moreover, most indicators show a raggedly flat canyon basin between the summers of 1932 and 1933 rather than anything that resembles the beginning of the recovery phase. Many economists simply do not accept the Cole and Ohanian case for the supply side.

The quantitative easing referred to by Anderson brings us to another prominent explanation for the recovery. It comes from the works of Friedman and Schwartz (1963) and Christina Romer (1992). They give most of the credit for the recovery to the growth of the money supply from 1934 onward. The Federal Reserve gets no credit for this quantitative easing plan. The source of the money supply growth during the recovery phases was not Fed open market operations. Instead it was the inflow of gold. Following the devaluation of the dollar by Roosevelt, foreign capital inflows created an almost continuous flow of gold into the United States. While gold no longer was money, the Treasury monetized the gold inflows by purchasing it with reserve-creating gold certificates. As a result, the monetary base swelled. According to this monetary explanation, that steady growth in the monetary base pushed the money supply upward at a brisk pace. And unlike in the more recent period, both reserves *and* the money supply grew, and aggregate demand and GDP climbed at double-digit annual rates. Although the alternative, supply-side explanations for the recovery that were described above have been developed since Romer's 1992 study, her belief in this monetary explanation has not wavered. In 2011, she reaffirmed her belief that the gold inflows powered "an aggressive monetary expansion that effectively ended deflation," reduced real borrowing costs, and set off a rise in interest-sensitive consumer and business spending (Romer, 2011).

Until Romer's study of the recovery from the Great Depression, the evidence of the monetary version of the recovery was hidden in plain sight from most observers. Friedman and Schwartz, as Romer points out, were so intent on arguing that the Fed did nothing positive in the 1930s – either to prevent the economic contraction or to promote the recovery – that they failed to emphasize the significance of the information that they provided concerning the growth of the money supply and its impact on the recovery. On Chart 37 of *Monetary History*, they show, among other things, the paths for real income, nominal income, and the money supply. A portion of that chart is reproduced in Figure 4. One cannot miss the apparent correlation among the three variables. Given their crusade to demonstrate how much money mattered during the contraction, they mostly passed up a compelling opportunity to use the recovery years as further evidence that it was the money supply that drove aggregate demand upward post-1933 as much as it had driven it downward in the four years prior to that.

This evidence lay unexploited until Romer focused on the cause of the recovery. In brief, she presents a case that the following transmission-mechanism chain of events transpired: 1) gold flowed in from Europe and was deposited in U.S. banks, 2) the Treasury bought the gold from its owners and paid them with a check and deposited gold certificates in the banks' reserve account at the Fed, 3) bank reserves and bank deposits went up commensurately, 4) banks presumably lent these reserves at negative real interest rate levels, and 5) interest-sensitive spending increased. Let us first look at steps one through three in that process. It is no mystery what the basis of the money supply growth from 1933 onward was. It was unambiguously the gold inflows: "the consequence of the gold inflow produced by the revaluation of gold plus flight of capital to the United States" (Friedman and Schwartz, p. 544). Figure 5 shows the parallel trends for gold, high-powered money, and the money supply during the recovery period.

Once again, an apparent correlation is difficult to ignore. The money supply growth came about in spite of forces within the banking system working against it. The creation of the FDIC had helped to bring deposits back into the banking system, but that did not keep the money multiplier from continuing to fall due to a continuous decline in the deposits-to-reserves ratio. Bankers were still maintaining high levels of reserves to protect themselves. As a result, the ratio of money to high-powered money declined rather than

grew, weakening the money multiplier. Yet, in spite of these gale-force headwinds, the money supply still managed to grow rapidly. This pattern is reminiscent of the 1830s, discovered by Hugh Rockhoff (1971), when money supply growth was caused by another big specie inflow. Given that the ratio of money to specie did not climb after Jackson moved federal deposits to "pet banks," the rise in the money supply must have been due to the denominator in the ratio – that is, specie. For the 1930s, Romer came to a similar conclusion: "Since … the money multiplier fell during the recovery…the observed rise in M1 must have been due to even larger increases in the stock of high-powered money…" (Romer, 1992, p. 772). Moreover, since the Fed made no move to respond to any increase in economic activity, she further concludes that "the growth in the money supply in the recovery phase of the Great Depression was not endogenous" – that is, not triggered by the recovery itself (Romer, 1992, p. 774). Thus, she found no evidence that the growth in the money supply was due to anything other than the inflow of gold. It was as if the Treasury conducted open market operations in the gold market, and the result was vigorous growth in the money supply. Their purchases of the gold triggered corresponding growths in both bank deposits and reserves. The gold certificates acted as newly-created reserves (Griffith Johnson, 1939, pp. 46-7). So, instead of the Fed creating reserves out of thin air with open market operations, the Treasury did.

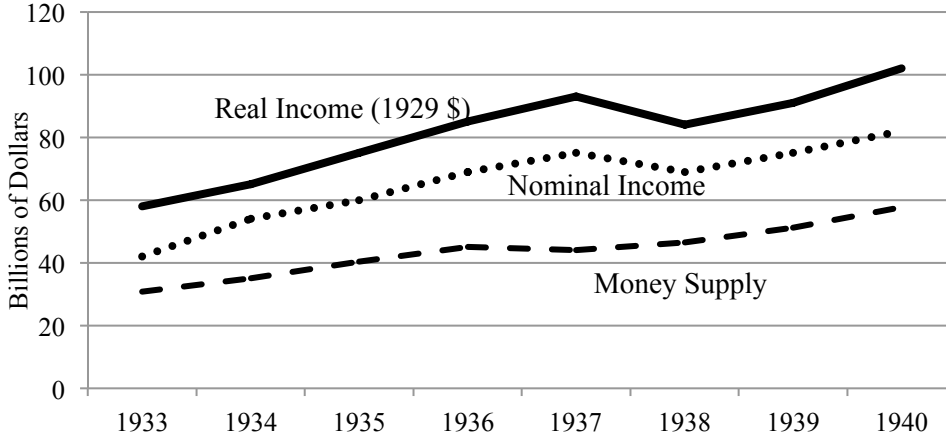

Figure 4. Money Fueled Recovery (1933-40)
Source: Friedman and Schwartz, 1963, p. 494.

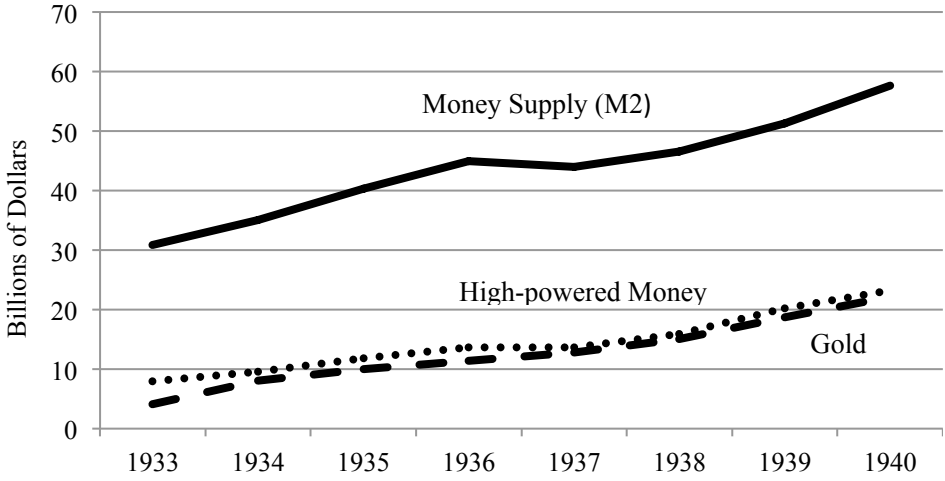

Figure 5. Gold and Money (1933-40)
Source: Friedman and Schwartz, 1963, p. 500.

To Friedman and Schwartz, the most important point was that the Fed contributed virtually nothing to this policy. To Romer, regardless of who engineered the growth of reserves and regardless of the intention, the more significant point is that these reserves fueled rapid increases in the money supply and aggregate demand. Now let us move on to the final two steps in Romer's transmission mechanism, translating the increase in reserves into proportional increases in the money supply and aggregate demand. She tested for cause and effect between the money supply and aggregate demand. Her examinations of fiscal and monetary multipliers led her to the conclusion that what propelled aggregate demand upward in the 1930s was the growth of the money supply. The key point to her was what happened to real interest rates and interest-rate-sensitive spending. Just as with the contraction phase, it was real interest rates that mattered (Kenneth Weiher, 1981, 1986). The double-digit real interest rates of the 1930-33 period belied the impression that liquidity was plentiful and explained what choked off capital investment to the point that it disappeared. Romer demonstrates a strong inverse relationship between the decline in real interest rates on one hand and the increased levels of fixed investment and consumer durables spending on the other.

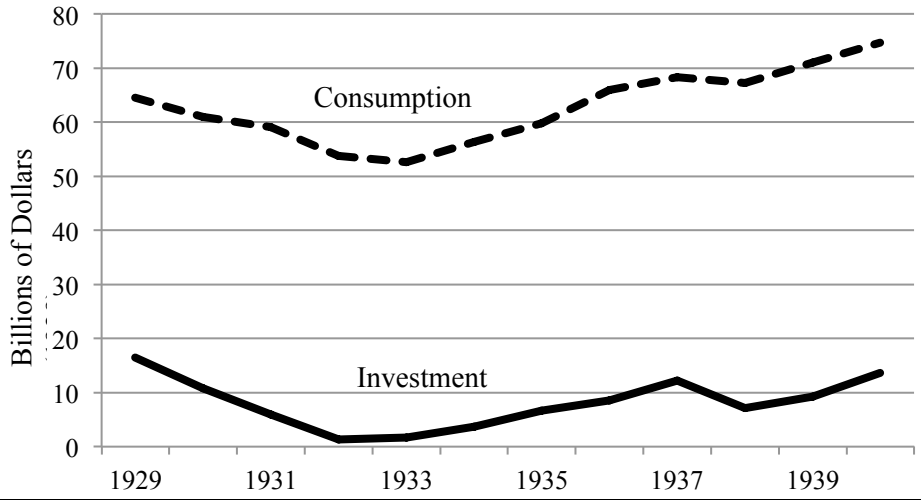

Figure 6. Consumption and Investment (1929-40)
Source: Federal Reserve Bank of St. Louis.

The rebound in spending was quite pronounced, albeit not robust enough to bring the economy back to full employment, as Figure 6 demonstrates. While investment climbed back from virtually zero to just below 1929 levels by 1940, consumption topped 1929 levels from 1936 onward, even during the 1937 relapse. These combined spending levels still left the economy far below potential GDP; nevertheless, this revival in private-sector spending appears to have powered the recovery, such as it was. And, according to Romer, absent the money supply growth, the recovery would have been decidedly weaker. It pushed down real interest rates, and private spenders apparently responded by borrowing and buying. Romer concedes that this correlation does "not prove that the fall in interest rates caused the surge in investment and durable goods consumption." But, she continues, this information does "at least suggest that there is no evidence that the conventional transmission mechanism for monetary developments failed to operate during the mid- and late-1930s." (Romer, 1992, p. 781).

While no one can absolutely prove that the gold-fueled money supply growth propelled the recovery phase of the 1930s, the 1937 recession provides compelling evidence of what happened when the money supply

stopped growing and thereby provides support for the monetary explanation. The blame for the "Roosevelt recession" has been passed around a bit over the years, with both fiscal and monetary policy targeted. However, the consensus has gravitated toward a monetary explanation. Friedman and Schwartz (1963) pinned most of the blame on the Fed and its doubling of the reserve requirement, and Romer (2009) still agrees. However, the trend has been to give greater emphasis to the Treasury's policy reversal that led them to sterilize gold inflows beginning in December 1936 (Douglas Irwin, 2011 and Charles Calomiris, Joesph Mason, and David Wheelock, 2010). The Fed and Roosevelt were both concerned about the inflationary potential of the massive increase in the monetary base. In today's parlance, they were looking for an "exit strategy." Even though gold continued to flow in throughout 1937 at a pace that was easily as rapid as in the preceding three years, the monetary base and money supply did not grow for about sixteen months, as can be seen back in Figure 5. The negative impact on the economy is apparent in Figure 4. With the reversal of sterilization came renewed money and economic growth. This interlude serves almost like a controlled experiment to demonstrate how important the gold-fueled money supply increases were to the recovery. Take them away, and the recovery halts dead in its tracks. Resume them, and the recovery picks up where it left off. The importance of the monetizing of the 1933-40 period to the recovery seems safely established. Let us look at exactly how it worked.

Gold Inflows Overcome Credit Crunch Conditions

Actually, the transmission mechanism did not operate in such a normal fashion during this recovery as Romer contended. As was pointed out by Charles Calomiris (2011, p. 6), "there was near-zero loan growth" during the recovery. Figure 7 shows that bank loans were indeed flat during the recovery period. Banks primarily channeled the growth in high-powered money on the assets side of their balance sheet into increases in government securities and reserves held either at the Fed or in the form of deposits with other banks.

As Figure 8 depicts, the $16 billion increase in bank deposits from 1933 to 1936 was primarily balanced on banks' assets side by a $6.6 billion increase in government securities, $6.3 more in reserves, and a mere $.5 billion increase in loans. The trends continued for the rest of the decade. These data paint a rather puzzling picture. The normal transmission

mechanism between an increase in the monetary base and an increase in the money supply – and the one that Romer presumed occurred – has increases in the monetary base triggering loans, which in turn increase the money supply through the bank multiplier process. Whether one takes the Keynesian track and emphasizes the intermediate step of reduced interest rates or one simply takes the Monetarist route and goes straight to the money supply increase, reserves normally do not become money until the banks lend them. And loans are a means to an end, spending.

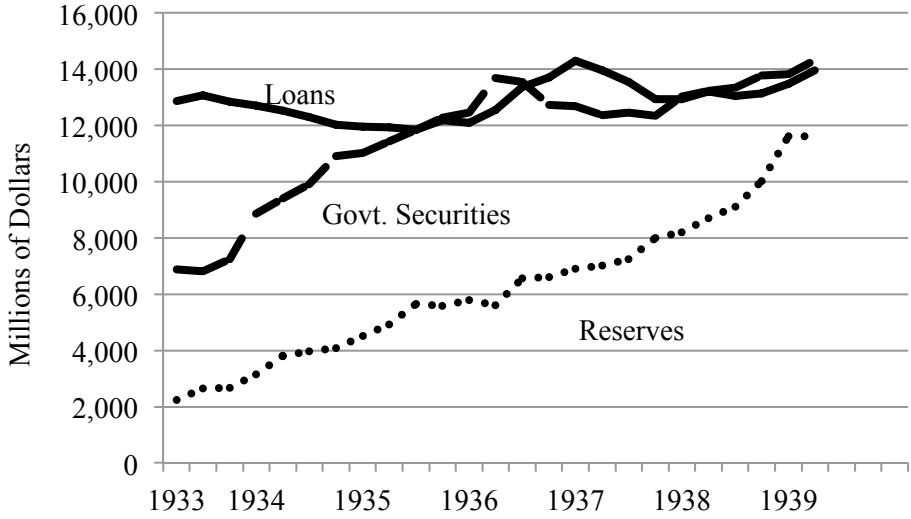

Figure 7. Bank Assets, 1933-39
Source: Federal Reserve Bank of St. Louis.

That is the central issue with the slow money growth in the recent recovery. One can add all the reserves one wishes, but the money supply will not grow until the banks lend those reserves. Yet here we are faced with 1930s data that show no significant loan growth to mirror the 60 percent increase in deposits. At the same time, we know that nominal Gross National Product (GNP) rose in proportion to the money supply, and it appears that it was consumer and investment spending that drove those sales upward, as we

saw in Figure 6. Without loans, the bank multiplier does not normally operate, but here we have evidence of the money supply growing without loans. Interest-rate-sensitive spending by consumers and businesses may have propelled aggregate demand upward, like Romer contended, but this spending did not result from a net growth in loans from banks. Not only was the Fed still sitting on the sidelines, but so were banks. This is not the scenario Romer meant to portray.

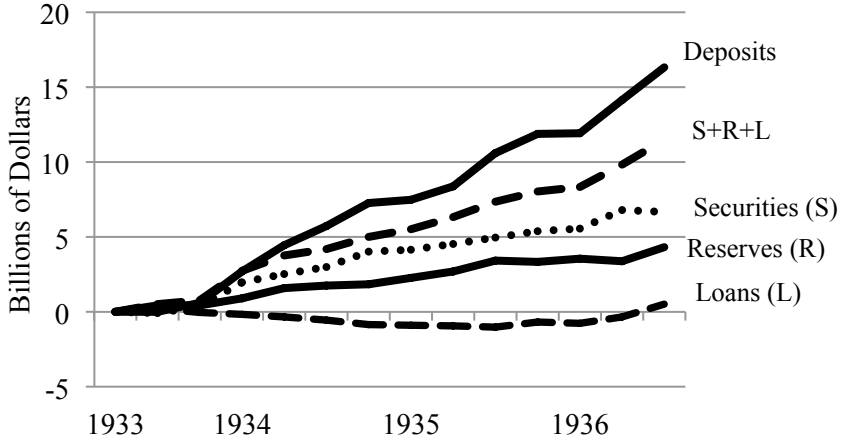

Figure 8. Change in Bank Assets and Deposits, 1933-36
Source: Federal Reserve Bank of St. Louis.

Building up excess reserves or government securities, as banks did in the 1930s, will generally stunt the multiplier process and prevent the money supply from growing. When banks take the conservative route of accumulating reserves and government securities instead of riskier loans, those actions are typically associated with credit-crunch conditions. Banks follow this strategy to reduce the risk structure of their portfolios either to meet their own preferred standards for a reserve cushion or to conform to standards set externally by regulators. As a rule, that approach is not conducive to vigorous money supply growth, just the opposite. For a more recent-example, this was the approach followed by banks during the credit crunch of 1990-91. They were avoiding making loans and acquiring Treasury securities to improve the risk rating of their asset portfolios and higher capital requirements dictated by the Basel standards. The result was stubbornly slow

money supply growth. On that occasion, instead of quantitative easing, the Fed resorted to lowering the reserve requirement to break up the reserve logjam and encourage banks to increase their lending. More recently, as discussed earlier, the Fed responded to the 2008-11 credit crisis and credit crunch by flooding the banking system with reserves with two goals – among others that we will discuss later – in mind. One was an effort to drive down short- and long-term interest rates to stimulate lending. The other was to overcome the banks' revealed need to hold extra-large amounts of reserves. This need arose in part from their response to regulators' more restrictive risk standards and also their own desire to maintain a greater liquidity cushion. As of the summer of 2011, this most-recent and more-massive reserve logjam continued to block the flow of new loans and the recovery.

That is what makes the pattern on the mid-1930s so interesting and possibly informative. In spite of banks following a course that appears consistent with a credit-crunch scenario – that is, building up their holdings of reserves and Treasury securities – bank deposits and the money supply grew rapidly. The growth in deposits and the money supply did not depend on bank lending. It was based upon the gold inflows – injections of "outside money" in more than one sense of the word "outside." If one compares Figures 4 and 8, one can see that bank deposits' growth almost matched the inflow of gold, dollar for dollar, while the money supply grew by 1.75 as much as the increase in the other two.

To better understand how the gold inflows turned into bank deposits and money, let us lay out the process, step by step whereby, let us say, a German would transfer his/her wealth to the United States for safe keeping. An American bank would only accept deposits from a German in a form that the Fed would recognize as a reserve asset – in this case, gold. Thus the German would convert the wealth into gold if it was not already in that form and transfer it from a bank, likely in London, to an American bank. The German knew that the Treasury, at that time, was buying gold at $35 an ounce, up from $20.67 since the devaluation. The American bank into which the German funds were being transferred would have created a bank deposit for the German in dollars. At that point, bank deposits and the money supply have risen by an amount equal to the gold inflow. The bank would next transfer the gold to the Treasury and receive a claim to the gold, which it would deposit at the Fed in return for a credit of reserves from the Fed. This increases the

monetary base by an amount equal to the gold inflow. It is what the Treasury and/or Fed do next that determines whether the money supply increase is validated as a net increase or is counter-balanced by a corresponding removal of funds – that is, sterilized. The Fed had two options. It, by itself, could sterilize the transaction by making a cancelling open market sale of securities and thereby remove the same amount of reserves from the system. This is what the Fed did far too much of, according to Friedman and Schwartz as well as Michael Bordo, Eshan Choudhri, and Anna J. Schwartz (1995), during early stages of the monetary contraction. But fortunately for the economy, the Fed did not sterilize gold inflows during the recovery phases. The Fed took option two, which was to do nothing. The Treasury also had two choices, and they involved how they paid for the gold. They could either, a) issue a gold certificate to the Fed, or b) issue securities and thereby borrow the funds to pay for the gold.

The latter option borrows already-existing funds from the economy to pay for the gold and turns the transaction into a mere transfer of funds with no net growth in reserves or the money supply. This is another version of sterilization – one which the Treasury would use in 1937, as mentioned earlier. The result would be no growth in the monetary base. The gold certificate option pays for the gold with a piece of paper, which was as good as reserves as well as gold. The Fed accepts this certificate as an asset to balance the reserve liability. The funds to pay for the gold essentially appear out of thin air from the Treasury much as reserves materialize to pay for government securities during a Fed open market operation. It is the Treasury's version of open market operations. Gold inflows support the growth of the monetary base and money supply. Without any increase in bank loans, the money supply grew. Instead of the new reserves being injected into the back door of banking system as "inside money" by the Fed open market operations, the new reserves came in the front door by way of the gold inflows. The Treasury merely validated the new deposits by creating the reserves to pay for the gold. It was like manna from heaven – or, in this case, from Europe.

While the banks lent only a very small portion of their new reserves, they did buy government and other securities with them (by far, more of the former) in the amount of $7.6 billion between 1933 and 1936. Such securities purchases, when acquired from the public rather than the Fed, resulted in further additions to deposits and the money supply. Again, no bank loans

were necessary for that money supply growth. From bank data, we have no way of knowing for what purpose all these new deposits were used. We have only the data showing the increases in consumer and investment spending to suggest that these funds found their way into aggregate demand. This is an entirely different-looking money multiplier process, one that is accomplished without bank loans. The primary injection of reserves comes from outside the economy into the banking system, rather from the Fed. Deposits and the money supply grow with the gold inflow. The Treasury validates the new injection by creating reserves with gold certificates. The next round of the money creation comes in the form of banks using their new reserves to buy investment securities. In spite of this action being relatively conservative compared to bank lending, it does lead to more deposit creation and further money supply growth. These Treasury transactions are comparable to Fed open market operations in the sense that both essentially create reserves out of thin air. However, there is a big difference. In the gold purchase case, both deposits and reserves grow with the gold inflows; whereas in the Fed open market operation case, only reserves are guaranteed to grow. *Gold inflows are a form of quantitative easing that can be superior to open market operations in terms of their direct impact on the money supply.*

We have examined why the money supply grew so much in the 1930s in spite of financial conditions that are associated with a credit crunch. Instead of money flowing from the inside out – as is the case with open market operations – this money came from the outside in. In a sense, these funds became money as soon as they became reserves – as long as the Treasury did not sterilize them. Even though banks were apparently not in the mood to lend and/or the public was not in the mood to borrow, the money supply grew rapidly, as did aggregate demand. The transmission process may not have been the way Romer envisioned it, but gold inflows did propel the money supply upward. And it appears the money supply growth drove aggregate demand upward. However, the conduit between money supply growth and aggregate demand growth was not bank lending. Given the persistent stagnation of lending and the inaction of the Fed, the recovery likely never would have happened were it not for the fortuitous gold inflows.

Methods of Monetization

It turns out banks were just as reluctant to lend money in the 1930s as they were after the Great Recession. This really should come as no surprise. In fact, this author was drawn to the topic of this paper by the seeming contradiction of the rapid money supply growth of the recovery of the 1930s – that is, in a financial environment that must have been as laden with risk aversion and economic uncertainty as any period in U.S. banking history. Why would banks be any more comfortable with lending money in 1935 than they were in 2010? It turns out they were not. The recovery may have been monetized by gold, as Friedman and Schwartz and Romer contend, but it was not monetized by banks' lending reserves born out of the gold inflows. Loans were up by less than a billion from 1933 to 1940, while bank deposits had doubled, increasing by over $24 billion. It was as if funds were air-dropped behind the lines of recalcitrant bank lenders directly to depositors, and fortunately for the sake of the recovery they must have spent a significant portion of those funds.

The realization that the money supply growth of the 1930s was not the result of banks' lending newly-created reserves puts the 1930s in a whole new perspective. It suggests that the recovery was not just fueled by the gold inflow; it may have been totally dependent upon it – that is, if one believes that the recovery could not have come without increased aggregate demand. Cole and Ohanian would argue that the gold inflow was a helpful, but not necessary, since they give credit to the supply side. But the correlations of not just the recovery but also the midcourse recession with the monetary base and money supply rates of growth and decline, respectively, strongly support the demand-side explanation for the recovery, recession, recovery sequence. Given the headwinds that the economy faced – headwinds emanating from both credit-crunch conditions and suspect government policy – it is quite likely the recovery would not have occurred absent the gold inflows.

One might ask another counterfactual question: Without the gold inflows, would the Fed have taken actions to increase the monetary base; and even if they had, would these actions have worked to increase the money supply and aggregate demand? The answer to the first part of the question is a difficult speculation, but the analysis of Friedman and Schwartz (1963, pp. 511-34) does not leave one with the impression that the Fed could have been counted on to provide the monetary base that the economy would have

needed. Marriner Eccles, who served as head of the Board of Governors from 1934 on and who was a follower of Keynes, seemed to think that fiscal policy should be the source of additional aggregate demand, not monetary ease (Christina Romer and David Romer, 2004). Regardless, given what we have seen in the data for bank lending, the answer to the second part of the question would appear to be "No." Had the Fed aggressively added reserves to the banking system in amounts that would have duplicated what the gold inflows accomplished, the reluctance of banks to lend the gold-created reserves provides compelling evidence that the reserves would have piled up in bank vaults much like they did in 2008-11. The 1930s' quantitative easing, had it emanated from the Fed rather than from the Treasury, may well have produced little money supply growth. Creating billions of dollars of inside money would not have fueled aggregate demand growth if the banks did not lend the reserves. Gold may have trumped zero-interest-rate conditions.

Of course, a country cannot engineer gold inflows at a drop of a hat. Hitler's policies and other uncertainties in Europe deserve more credit for the 1930s gold inflows than any American policy makers' actions. The notion of air-dropping funds directly to people seems unorthodox, but it calls up the famous analogy from Milton Friedman's *Money Mischief* (1992, p.29) that was made infamous in 2002 in a speech by then Fed Governor Ben Bernanke. Friedman used the helicopter example as a means of describing the inflationary effects of a monetary authority adding excessive money to an economy. Bernanke alluded to it when explaining how the Fed could join forces with the Treasury to overcome deflationary pressures. He suggested the "government could increase spending on current goods and services or even acquire existing real or financial assets. If the Treasury issued debt to purchase private assets and the Fed then purchased an equal amount of Treasury debt with newly created money, the whole operation would be the economic equivalent of direct open-market operations in private assets" (Bernanke, 2002). Important point: It would be the equivalent only if banks lend the reserves created by the Fed's purchases of Treasury securities. In a zero-interest-rate scenario, such concerted action may prove to be ineffective.

The helicopter drop concept has become quite popular in the literature, both scholarly and blog, that focuses on the appropriate policy for an economy with interest rates at or near zero. A number of works have analyzed a strategy of some hybrid of monetary and fiscal policy that leads to a direct

injection of money into the economy – e.g., Alan Aurbach and Maurice Obstfeld (2005), Willem Buiter (2003), John Cochrane (2011), James Clouse, Dale Henderson, Athanasios Orphanides, David Small, and Peter Tinsley (2000), Gauti Eggertsson and Michael Woodford (2003), Daniel Thorton (2010), and Marvin Goodfriend (2000). This discussion has given new life to the whole debate about the alleged existence of a liquidity trap during the 1930s dating back to Karl Brunner and Allan Meltzer (1968) and Keynes himself (1936). The topic has been revived, with Japan's experiences in the 1990s and 2000s being added to the discussion – e.g., Hanes (2006), Krugman (1998 and 2000), and Lars Svenson (2001). What qualifies as a "liquidity trap" depends on who defines the criteria, but all of these works and more address the problem of devising the appropriate policy to contend with an economy whose interest rates are near enough to zero to make normal monetary policy quite difficult if not for all practical purposes futile. In fact, the term "quantitative easing" was born out of Japan's efforts to overcome liquidity trap conditions. This new term was invented to describe open market purchases that are focused more on the quantity of funds rather than on lowering interest rates. Friedman and Paul Volcker would have simply called this "expansionary monetary policy."

In spite of the unique nature in both depth and breadth of the Fed's acquisitions of assets starting in 2008, most of these transactions were purchases of financial assets from financial institutions that resulted simply in the creation of more reserves – that is, inside money. As for the Treasury's expenditures, they were financed with already-existing funds. For example, in 2011 the Fed purchased Treasury securities during QE2 equal in dollar value to about seventy-five percent of the size of the federal deficit for that year. That may seem like monetizing the deficit, and it may look very expansionary or even inflationary, and it sounds exactly like what Bernanke described in his helicopter comments. However, as we saw earlier, these purchases did not spur significant money supply growth in the absence of bank lending. The Fed's buying of securities from financial institutions added to the monetary base and possibly kept interest rates lower than they otherwise would have been, but it did not result in money supply growth. And the Treasury's debt transactions, which were simply a relocation of funds, apparently did little to spur velocity. That left aggregate demand unchanged. The consensus view from the more recent articles listed just above is that the Fed's only hope for

success with these operations was if it provided "forward guidance" that would shape market expectations in a manner that would lead to a change in behavior and thereby a change in aggregate demand. Actions that are viewed as temporary are less likely to affect behavioral modification. And since the Fed promised an "exit strategy" that would remove reserves when inflation threatened, these transactions could certainly be considered temporary. By 2012, there was no discernible change in market behavior and no strong aggregate demand rebound.

Somehow the economy of 2008-11 needed to reproduce the results of the gold inflows of the 1930s without the actual inflows. To do so, the Treasury needed to have the ability to increase the money supply outside of the banking system as it had back when it bought the gold with gold certificates. Now, it only has the ability to spend already-existing funds, not the power to create the funds. On the other hand, the Fed has the ability to create funds, but not the ability to inject them directly into the non-bank circular flow of the economy. Suppose the Treasury and Fed chose to boost demand with spending on infrastructure, as some "helicopter drop" proponents suggest. If the Treasury spends on bridges and road and finances this spending with the sale of securities, the only way to guarantee an increase in aggregate demand is to sell those securities directly to the Fed. The money supply goes up as soon as the construction companies deposit their checks. And, when the construction companies spend those funds on land, labor, and capital, we have triggered the income multiplier process. If the banks lend their increased reserves resulting from the deposits, we have also triggered the money multiplier process as well. But even if the banks do not cooperate and lend the new reserves, the money supply and aggregate demand will have grown as they did in the 1930s. That would be one way to circumvent credit-crunch barriers in a zero-interest-rate economy in a manner that would not necessitate the use of a helicopter. It would move the trough outside the banks, where the public could actually access it. This time the manna would come from the Fed, not Europe.

But the Fed is prohibited from buying securities directly from the Treasury. It is also banned from creating liabilities without acquiring matching assets. These two prohibitions make sense. They are there to reduce the likelihood of inflation by keeping the Fed independent and limiting its money-creation power. However, without such powers, escaping the

doldrums is most difficult. It is a matter of where one locates the trough – inside or outside the banking system – that determines whether or not the horse will drink. It does little good for the Fed to fill the banks' troughs with reserves if the bankers do not allow borrowers to access the trough. With bank lending contracting throughout 2009 and expanding at a snail's pace in 2010 and 2011, the economic recovery from the Great Recession had very little money to propel it. The same thing would have been the case in the post-1933 period were it not for the gold inflows. They allowed the money supply to grow in spite of bankers' reluctance to lend because the gold-filled troughs were located outside the banks' vaults. Had it not been for "outside" nature of the gold inflows, the money supply likely would not have grown, and the recovery phase of the Great Depression decade would have been even less sanguine than it was. The economy would have had to deal with all of the negative impacts of New Deal policies on both aggregate demand and supply without the benefit of serendipitous growth of the money supply and its positive impact on consumer and investment spending. One can only imagine how much worse the 1930s would have been minus these injections. As Mr. Bernanke pondered alternative ways of stimulating aggregate demand in 2012, he might have applied even more lessons from the 1930s than he had already done. After QE1, QE2, and his version of "Operation Twist" all failed to stimulate bank lending, he resorted to QE3 in 2012. By that time, he must have wondered if there was some way to relocate the trough.

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