Monetary Policy and the Twin Crises

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Abstract. After presenting a brief overview of the recent financial crisis and the European debt crisis that followed in its wake, this paper goes on discuss monetary policy in the United States, the United Kingdom and the Euro bloc prior to and during the course of the two crises. The paper presents historical evidence for the three areas on the relationships linking the volatilities of output, inflation and monetary growth. In all three these relations are strongly positive. There is, therefore, no tradeoff between inflation and output volatility; the two move up and down together. Both, moreover, move up and down with the volatility of monetary growth. Viewed from this perspective, the increased volatilities of money supplies and the monetary base in the United States, the United Kingdom and the Euro bloc over the last half decade pose problems.

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1. Introduction

As its title indicates, this paper focuses on monetary policies and the relations linking those policies to the twin crises that have plagued the advanced economies to varying degrees for over half a decade. I begin with an overview of those crises – the financial crisis that began in 2007 in the United States and that worsened substantially and became virulent during the course of the next year and the debt crisis that followed in the countries of the European periphery. Here I draw on the studies that have been done over the past five years, many of which have been published in special conference issues of this Journal.

I then go on to discuss the role of monetary policies in the Euro area, the United Kingdom and the United States both prior to and during the financial crisis and in the years thereafter. As measures of monetary policy I use two sets of indicators: ex post real policy interest rates – the counterparts of the nominal interest rates that the European Central Bank, the Bank of England and the Federal Reserve target – and two monetary aggregates – the monetary base and a broader definition of money that varies slightly with the country or country group.

Two inferences follow from the analysis of monetary policy prior to and during the financial crisis. The first is that in the United States and for the peripheral countries of Europe those policies were overly expansive. They, therefore, contributed to the run ups in asset prices that preceded the financial crisis in both areas. In the United Kingdom and the European core, however, this does not appear to be the case. Policies appear to have been more or less neutral. The second and related inference is that the one-size-fits-all policy that EMU brought about has simply not worked well. A monetary policy that was just about right for the European core appears to have been too expansive for the European periphery.
In reaction to the financial crisis and as the debt crisis has unfolded, policy became more expansive in the United Kingdom and the United States and to a lesser degree, Europe. Central-bank target rates fell to near zero and have remained there. More important, the monetary base in all three underwent unprecedented increases. Meanwhile the economic recoveries have varied from weak to at times non-existent. I turn to these issues later in the paper. I then go on to examine long-term evidence on the relationships between the volatilities of inflation, output growth and monetary growth for the United Kingdom, the United States and the Netherlands as a proxy for the countries of the Euro area. The evidence here is disquieting. In all three, the relations between inflation and output growth are strongly positive. There is no trade-off between inflation and output volatility; the two move up and down together. Both, moreover, move up and down with the volatility of monetary growth. Viewed from this perspective, the increased volatilities of money supplies and the monetary base in the United States, the United Kingdom and the Euro bloc over the last half decade pose potential problems that ought not be glossed over. I conclude with a series of observations on what needs to be done going forward.

2. Overview of the twin crises

In spring 2007, house prices in the United States, after a substantial run up over the course of the previous seven years, peaked and then began what eventually turned into a precipitous and rather long-lived decline.¹

At almost the same time, the first signs of dislocations in world credit markets started to emerge both in London and New York. During the course of the next year they spread. Then in

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¹ This dating is based on the Case-Shiller index. The alternative OFHEO index actually peaked three quarters earlier.
September 2008, the credit-market problems worsened even further and out and out panic ensued. Other advanced economies, many of which were experiencing problems of their own making, got sucked into the fray. The coup de grace was the Lehman failure and the announcement of The Troubled Asset Relief Program (TARP) by the United States government. The two, albeit in differing ways, were accompanied by greatly increased uncertainty in financial markets as evidenced in the soaring LIBOR-OIS spread, which at its peak in October 2008 reached over 350 basis points.

Several aspects of the financial crisis and the problems that led up to it stand out. The first is the proliferation of subprime real estate loans that were securitized and combined into collateralized debt obligations (CDOs) and that became increasingly important in the half decade leading up to the crisis. Gerald Dwyer and Paula Tkac in their paper “The Financial Crisis of 2008 in Fixed Income Markets" provide a particularly detailed analysis of this phenomenon and the problems that ensued. Concluding their discussion, they write: "The drivers of the financial turmoil and the Financial Crisis of 2008 were heterogeneous securities [the CDOs] that were hard to value. These securities created concerns about counter party risk and ultimately created substantial uncertainty. The problems spread in ways that were hard to see in advance." The uncertainty that these developments engendered had extremely adverse effects both in U.S. and foreign credit markets more generally and, as the crisis spread, throughout the rest of the world financial system.

A second aspect of the financial crisis that deserves comment is the role of Federal Reserve policy. The low interest-rate policy followed by the Fed in the early 2000s, although it did not lead to increased inflation in the economy at large, does appear to have exacerbated the
boom in U.S. house prices and thus made the subsequent bust greater than it otherwise would have been (Taylor, 2009). A third is the role played by the increased uncertainty that developed as a result both of the crisis itself and the policies that the government pursued thereafter. The recession in the United States was over in mid-2009 but the recovery has remained anemic.

By some accounts, the increased level of uncertainty is the principal reason why this has been so. The alternative explanation is that weak recoveries are a natural concomitant of financial crises (Reinhart and Rogoff, 2009a, 2009b, 2012). But that does not square with the historical experience in the United States (Bordo and Haubrich, 2012; Dwyer and Lothian, 2011, 2012) nor with historical experience more generally (Dwyer et al., 2013).

The United States played the key role in the financial crisis, but it played little or no role in the European sovereign debt crisis that followed. That crisis, as Joshua Aizenman, Michael Hutchinson and I noted in our overview of a special conference issue of the Journal of International Money and Finance on the subject (Aizenman, Hutchinson and Lothian, 2013, p. 1) was "rooted in the uneven growth performance of the different Euro countries, the unsustainably large public debts of some EU periphery countries, and the incompleteness of the euro project."

It was initially concentrated in four countries, Ireland, Greece, Portugal and Spain – five if Italy is included – and somewhat later in Cyprus. It was unanticipated in financial markets despite rather ample warning signs beforehand. It was not transmitted from one country to another to any large extent. It was instead sui generis, with different underlying causes depending upon the

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2 On the effects of uncertainty in the United States see Baker, Bloom and Davis (2013). On the effects in the United Kingdom, see Haddow, Hare and Shakir (2013) and on the effects in Europe see Buti and Padoan (2013).
3 See Aizenman, Hutchison and Jinjarak (2013) for evidence based on CDS spreads and Beirne and Fratzscher (2013) for evidence derived from long-term government spreads and sovereign risk ratings as well as CDS spreads.
4 Beirne and Fratzscher (2013) examine the question of contagion during the crisis. They distinguish between three types of contagion – fundamentals contagion due to increases in the sensitivity of financial markets to existing fundamentals, regional contagion entailing an intensification of spill overs of sovereign risk across countries, and
country in question. In Greece and Portugal, the common culprit was chronic overspending by
government and resultant deficits over the course of years. The same was true in Italy, but to a
lesser extent. In Ireland and Spain, it was government attempts to shore up banking systems
greatly weakened by housing booms that, as in the United States, had turned sour. In Cyprus, the
profligacy of the Communist government elected in 2008 was the principal problem. Their
overspending damaged investor confidence and Cyprus got closed out of international financial
markets. That, in turn, created problems in Cyprus’ large banking sector, problems that were
heightened further by the 80 per cent write down of Greek debt.

An underlying problem in all instances was the monetary policy of the ECB that, while
seemingly just right for the core countries of the Euro bloc, proved much too lax for the countries
of the periphery. Working in the same direction were the huge capital inflows that all of the
stressed countries experienced in the period leading up to the crisis. These inflows reflected a
belief on the part of investors that the sovereign risk attached to the stressed countries’ securities
had become minimal once they joined the Euro. This belief, as is now clear, turned out to be
totally wrong.

A substantial reduction in long-term bond yields, large increases in growth rates of
money and credit, relatively rapid increases in prices and worsened competitiveness
accompanied these capital inflows. The inflows reduced the pressure for reforms in the stressed
countries by relaxing the budget constraints that the countries faced. They also made it more

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herding contagion entailing a temporary overreaction of financial markets that is clustered across countries. Their
results show that countries' own economic fundamentals and fundamentals contagion account for most of the
increase in sovereign risk during the crisis period. Regional contagion, in contrast, explains a much more modest
magnitude of sovereign risk. Herding contagion appears to have been concentrated in time and to a relatively few
markets.
difficult to distinguish between the Euro-zone countries that were performing well and the Euro-zone countries that were performing poorly, a problem that very likely contributed to the mispricing of sovereign risk during this period.

As Harris Dellas and George Tavlas argue (2012), these developments reflected the absence of a gold-standard type of adjustment mechanism to external imbalances. The periphery countries under stress all had large current account deficits while the core countries – Germany most especially – had current account surpluses. Under the gold standard that would have led to gold outflows from the periphery to the core, ushering in price declines and increased competitiveness in the periphery countries and price increases and decreased competitiveness in the core countries. Under the Euro that was not the case at all, capital flowed into the countries of the periphery.

3. Monetary policies prior to the financial crisis.

In the two-decade period from the early 1980s until the early 2000s, economic stability was the rule rather than the exception both in the United States and in most other OECD countries. Inflation was low and relatively stable. Cyclical fluctuations in real income were mild and few and far between. This was the era of the Great Moderation.

It also was the era of rule-like monetary policy rather than the stop-go policies that many central banks pursued in the decade and half leading up to the early 1980s. Ben Bernanke (2004) and John Taylor (1998, 2010) have stressed this difference between policies in the Great Moderation period and earlier as the reason for the enhanced economic stability of the Great
Moderation period. Milton Friedman (Taylor, 2001), argued much the same thing, but dated the shift in economic stability a decade later – 1991 or 1992 rather than 1982 or 1983.

Then sometime in 2003 the Fed altered course, as also did the European Central Bank, and appeared to have abandoned its previous rule-like behavior. The Bank of England, however, did not. We can see the changes in the first two incidences and the lack thereof in the third in Figure 1a. Shown there is a plot of the real policy interest rates of the three central banks for the period from 1999 to mid-2013.\(^5\)

Several features of Figure 1a stand out. The first is the shift to low and at times negative real interest rates in the United States and the Euro bloc that took place around the middle of 2001 and lasted through 2005. The second is the higher and much more nearly stable level of real rates in the United Kingdom in this period. The Fed and ECB were pursuing expansive policies during that period while the Bank of England was not. Taylor-rule equations place the long-run real rate in 2.0 to 2.5 per cent range. The U.S. and Euro-bloc real rates were clearly below that level and the U.K. real rate above that level until the financial crisis. Computations based on the Taylor Rule itself, which via its GDP gap term allows for short-term fluctuations in the natural rate, tell much the same story.\(^6\) So too do comparisons made by John Taylor (2013b) of policy in this period with policy in earlier years in which the inflation rate was similar. As the financial crisis progressed, however, all three real rates plummeted and have remained substantially negative ever since. This is the third noticeable feature of Figure 1a.

\(^5\) These are defined as the US Fed funds effective, UK Bank rate and the Euro area official lending rate less the rate of CPI inflation over the previous 12 months.

Table 1 shows all of this in terms of subperiod averages and also breaks down the Euro real rate into the real rates relevant to the core European countries and to the periphery countries. Figure 1b plots these two European real rates separately. The upshot here is that, given the higher inflation rates in the periphery, the real rate was much lower there than in the core countries or in the Euro bloc as a whole. Policy, judged by this metric was highly expansive, much more so than for the European core. Taylor-rule computations, moreover, show the same thing (Nechio, 2011).

In short, one currency did not fit all. ECB policies appear to have been fine for France and Germany but too loose for Ireland and Spain. That helped propel house prices higher in both countries and otherwise helped fuel on-going booms. In the event, it also seems to have been too expansive for Greece and Portugal. A major result, as Jean Pisani-Ferry (2013) has stressed, was the series of balance of payments crises and sudden stops that were a key part of the sovereign debt crisis. These were not part of the game plan and indeed it was thought that the single currency would bring an end to balance of payments problems. In the event, that was not the case.

In light of what transpired in the Euro bloc, Friedman’s skepticism with regard to the Euro and Margaret Thatcher’s earlier warning both seem quite prescient. (Friedman, 2000; Lenzer, 1992) “I think the euro is in its honeymoon phase,” Friedman wrote. “I hope it succeeds, but I have very low expectations for it. I think that differences are going to accumulate among the various countries and that non-synchronous shocks are going to affect them.” (Friedman, 2000, p.419). Thatcher in an interview with Forbes Magazine stated: “Every single fixed
exchange rate has cracked in the end. We’re all at different levels of development of our economies. Some countries simply couldn’t live up to a single currency... We should each of us be proud to be separate countries cooperating together.” (Lenzer, 1992)

Why were warnings like these about potential problems stemming from economic divergence widely ignored? Pisani-Ferry poses this question and then goes on to answer it. He writes:

One reason was that EMU was an economic endeavour based on a political decision, but even under these circumstances, policy could have been geared towards getting member countries and the euro area as a whole into shape for the new policy regime. This did not happen. When drawing on the literature, European policymakers too often practised selective reading, with worries dismissed and the optimistic interpretation prevailing.

I see scant evidence of a change in that regard.

4. Monetary policies after the financial crisis

Figures 2a through 2c show the time paths followed by the monetary base in the United States, the United Kingdom and the Euro bloc respectively. All three charts are in log form. It is clear from the charts that base growth has been substantial in all three cases at one time or another. In the cases of both the United States and the United Kingdom, the increases have been historically unprecedented; in the case of the Euro-zone countries, they have only been eclipsed by the base growth that took place in some European countries during the inflationary periods following the two world wars. Over the past year in the Euro zone, however, base growth has tapered off and actually turned negative. The issue going forward is what central banks will do as a follow up to the monetary policies that they have pursued since the onset of the financial crisis.
These increases in the monetary base since the start of the crisis have been a source of continued controversy. A number of economists and financial commentators have pointed to the potential problems surrounding the increases – the possibility of greatly increased inflation if the policies are not reversed and the possibility of sizable disruptions to financial markets if and when they are. So far, however, not much has happened on either front.

Other economists pointing to the continued slack in all three economies have argued that the lack of noticeable effects on inflation might very well have been expected and regard concerns about inflation as largely, if not totally, overblown. Many, if not most, officials of the Fed and Bank of England seem to have adopted this latter view. This, however, has been less true for officials of the ECB. Its “two-pillar” strategy has as its foci both interest rates and M3. In December 2005, the ECB began to raise rates despite low inflation and modest real GDP growth because of concerns about high M3 growth.

Part of the difference in views about policy stems from a difference in theoretical perspectives. The prevailing orthodoxy views inflation as determined by the Phillips Curve and monetary policy as being synonymous with interest-rate policy. In that schema, inflation cannot increase if output is below its potential level and provided that inflation expectations do not change. The behavior of the stock of money is irrelevant.

That view, however, fails to distinguish between the short and the long run and it restricts the mechanism by which monetary policy shocks are transmitted to a single financial market interest rate. One of the most well documented empirical relationships that we have in economics is the relationship between the nominal stock of money and the price level. Over the long run,
high rates of money growth result in high rates of inflation and low rates of money growth in low rates of inflation. Over the long run, moreover, the Philips Curve is vertical or positive sloping and certainly not downward sloping.

The evidence on the money-price relation is overwhelming. It is drawn from experience in many countries and over the course of many centuries.

Anna J. Schwartz in an article on secular inflation examined episodes of price change over the course of two and a half millennia. Her conclusion was that "Long-run price changes consistently parallel[ed] the monetary changes, with one exception for England in the sixteenth century." Studies surveying high-inflation and hyperinflation experience have concluded much the same thing (Fischer, Sahay and Végh, 2002; Harberger, 1978; and Siklos, 2003). Studies using both long-term historical data (e.g., Friedman and Schwartz, 1963 and 1982; Haug and Dewald, 2012) and multi-country panel data (Lothian 1985; Dwyer and Hafer, 1998; Lothian and McCarthy, 2009, McCandless and Weber, 1995) have provided further corroborative evidence.

In the high-inflation and hyper-inflation episodes, the excessive rates of monetary expansion were due to high government budget deficits that in turn led to high rates of expansion in the monetary base. After the financial crisis we have seen similarly rapid base growth but much less spillover into money supplies and virtually none into prices.

Two things have happened. Banks have simply held the newly created base money as excess reserves. This, in turn, has produced massive declines in the money multiplier in all three instances. At the same time, income velocity has fallen somewhat.

Similar developments took place during the Great Depression of the 1930s. A popular explanation for both was the existence of "liquidity traps." According to this notion, at the low
levels of short-term nominal interest rates existing at the time the demand functions for reserves by banks and for money by businesses and individuals became very nearly infinitely elastic. Subsequent research, however, has been unkind to both hypotheses.

George Morrison in his study of bank reserve behavior found no support for the notion of a liquidity trap in the demand function for bank reserves (Morrison, 1966). He attributed the increase in bank' excess reserves to a shift in the demand function for reserves resulting from "anxieties produced by banking liquidity crises" (Morrison, 1966 p. 115). Morrison's explanation for the high excess reserve holdings was similar to that of Friedman and Schwartz (1963, p. 449-462).

Arthur E. Gandolfi (1974) using cross-state data found no instability in the demand for real deposit balances of the sort that would be indicative of a liquidity trap in the demand for money function. Gandolfi and I in later work (Gandolfi and Lothian, 1976) using a greatly expanded version of Gandolfi’s original data set found the same thing.

In the current episode, many economists have pointed to the payment of interest on reserves by central banks as the reason for the increases in excess reserves. There is very likely some truth in that allegation. The payment of interest clearly reduces the cost of holding reserves and thus can be expected to increase the quantity of reserves that banks want to hold relative to their deposits. It might also affect the demand function itself. But that cannot be the whole story. Banks' portfolio decisions are not confined to a choice between holdings of reserves, holdings of short-term money market instruments and loans in the federal funds markets. The bank prime rate in the United States in July 2013 was 3.25 per cent, nearly 300 basis points over the rate paid on bank reserves while consumer loan rates were over three times
higher than that. In ordinary circumstances lending should have increased as banks took advantage of these higher returns. Why banks have not done so is, I believe, due to the uncertainty generated by the financial crisis and by the policies that have continued to be followed thereafter.

That payment of interest on reserves is far from the whole story is also clear from recent experience in Europe. In July 2012, the ECB lowered its deposit rate to zero and has kept it at that level since then. Banks' excess reserves are down substantially from the record levels recorded before the ECB's action but they remain extraordinarily high. The reason very likely has to do with uncertainty, including policy uncertainty. I turn now to that issue in the monetary policy context.

5. Historical evidence

According to John Taylor (2013a):

The record shows that in the absence of a rules-based framework the Federal Reserve has taken actions that have led to high unemployment and/or high inflation. During the period from about 1983 to 2003 Fed policy was more rule-like and less discretionary, and economic performance was good. In contrast, the discretion and interventions of the Federal Reserve increased starting around 2003 and have continued, especially in regard to large scale purchases of mortgage-backed securities and longer-term Treasuries, and the result has been poor performance.

The underlying issue here is the relationship linking output volatility, price-level volatility and monetary volatility. Taylor’s theoretical work posits a trade-off between the first two – lower inflation variability can be bought at the price of higher output variability and vice versa. Governing this result in Taylor’s model are the relative weights that the central bank places on output and price stability in the conduct of monetary policy. This “Taylor Curve” is an
efficiency frontier delineating optimal policy combinations. What, however, if optimal policies are not followed? In that case, as both Bernanke (2004) and Taylor (2013) have recognized and Friedman (2010) has forcefully argued, the relationship between inflation variability and output variability will be positive, both increasing in tandem with monetary variability.

What is the picture over the long term, in the century in which the Federal Reserve has been in existence and under earlier monetary arrangements including the gold standard? Figure 3a provides a scatter plot of measures of long-term output and price variability for the United States for the period 1800-2012. It is an extension of a chart in Friedman (2010).

Shown in the chart is a scatter plot of log moving ten-year standard deviations of real income growth and inflation for the United States over this long period. The relation is clearly positive. As inflation became more variable, so too did real income growth. We see almost the exact same thing in Figure 3b for the United Kingdom for the period from 1840 to 2012 and in Figure 3c for the Netherlands, which I use as a proxy for the Euro bloc because of data availability, for the period from 1825 to 2012. The US data are therefore hardly a fluke.

What is the reason for the positive, as opposed to negative relationships between the volatility of output growth and inflation in all three cases? Figures 4a through 4c speak to that question. Shown there are similar plots of the log standard deviations of real income growth against broad money growth. For the United States these data are for 1877 to 2012, for the United Kingdom for 1871 to 2012 and for the Netherlands from 1924 to 2011. In all three instances the sample periods were dictated by data availability. In all three instances the
relations are positive. Evidently, and not surprisingly, erratic money growth went hand in glove with economic volatility.

The chain of influence, I believe moreover, ran from money to the economy rather than the other way around. In the long spans of data analyzed here, the monetary regimes and the other factors affecting the supply of money in all three countries varied too much for there to have been a stable transmission mechanism from output to the supply of money.

<Figures 4a to 4c about here>

Consider the United States as an example. At the very beginning of the sample period, the United States had not yet returned to the gold standard and the monetary base was exogenous. After the return to gold in 1879, the balance of payments and the available supply of gold determined the base, but for all practical purposes the latter was an exogenous variable, dependent upon gold discoveries and the technology surrounding gold extraction. Then in 1913, the Federal Reserve was founded. During the two world wars, the Fed was passive, monetary policy being determined by wartime financing needs. Between the two wars the monetary regimes varied, as did policy conduct. In the 1920s, the United States was on a gold exchange standard and the Federal Reserve, to use Friedman and Schwartz’s terminology, saw its “high tide. In the 1930s, in contrast, the U.S. money supply declined by an unprecedented amount and the United States abandoned gold.

In the post-WWII era, four sub periods are distinguishable. The first is made up of the immediate post-war decades from 1945 to 1965. This was a period of fixed exchange rates in which the United States was the reserve-currency country. For most of this period, the Fed kept base growth moderate and inflation low. The second period from 1965 to roughly 1982 was that
of the Great Inflation. Here the Fed switched its focus to employment and growth. The result was a progressive ratcheting up of inflation and a breakdown of the fixed exchange rate system. In 1979, Paul Volcker became Fed chairman and the next year Ronald Reagan was elected president. Reducing inflation became the primary policy goal and by 1983 inflation had fallen to 3.2 per cent from 12.7 per cent three years earlier.

In the two decades that followed, Fed policy was again aimed at low inflation and actually produced that result. Fluctuations in output and employment, during these years were moderate, whence the appellation “Great Moderation”. In 2007, the Great Recession began and, as we have already seen, the Fed engaged in a massive shift in policy. I have argued elsewhere that this is very likely why this recession did not turn into something closer to the Great Depression of the 1930s (Lothian, 2011).

Similar variations in supply conditions took place in both the Netherlands and the United Kingdom, though the details were at times quite different from those in the United States. In neither of the two countries, therefore, does there appear to have been a stable mechanism of the sort that would be necessary for reverse causation to have been continuously operable either.

Central banks may very well be doing it again in terms of monetary volatility. Table 2 shows averages rates of monetary base growth and broad money growth in the United States, the United Kingdom and the Euro area during the course of the last five years. As we already have seen the base has risen substantially in all three instances. But, as Table 2 shows its rate of increase has been far from uniform over time. Broader money growth has been very much lower on average than base growth. In both the United Kingdom and Euro area, it has also fluctuated a good deal too and in both is now rather disturbingly low. Judged on the basis of the historical
data, that we have reviewed, the degree of volatility of monetary policies shown in Table 2 is quite alarming.

<Table 2 about here>

6. Final remarks

Federal Reserve Chairwoman Janet Yellen, at a January 1995 meeting of the Federal Open Market Committee, stated (Feldman, 2013):

I ask myself, what is it that the Fed can accomplish? .... I conclude that the actions of this Committee affect not just the level and variability of inflation but also at a minimum the variability of output and employment … The moral I draw is simply that the Fed should pursue multiple goals. ... I understand that the mandate of the Federal Reserve Act [of 1977] to pursue multiple goals is pretty vague.

The first part of Yellen's statement is unobjectionable, although I would be tempted to add the caveat -- "for better or for worse." The second part, however, is not. When Yellen made that statement in 1995 the Fed was doing a good job of it and continued to do so for the next half decade. It looked as if, as Milton Friedman put it five years later, that they had “installed a new and improved thermostatic controller in the 1990s” (Taylor, 2001).

The picture now, however, is quite different and judged by the data I have presented it was quite different throughout most of history both in the United States and abroad. Variability in money, rather than offsetting variability in the price level and real GDP, went hand in glove with both. In none of the data is there any evidence that central banks can successfully pursue multiple goals. Compounding the problem is the situation that the Fed and the other two central banks find themselves today. All have experienced substantial increases in the monetary base as a result of the actions they have taken to try to ameliorate the various effects of the crises. In the case of the Fed, problems also exist on the asset side of its book. As of late September 2013,
close to 40 per cent of its bond holdings were in the form of mortgage-backed securities. Such holdings have little to do with monetary policy per se; they are better placed under the heading of industrial policy.

Friedman and Schwartz (1963) were highly critical of Federal Reserve policy makers in the late-1920s and the early-1930s for both precipitating the recession that began in 1929 through policy tightening and for then turning that recession into the Great Depression through inaction when a series of banking panics ensued in the 1930s.

Ben Bernanke was well aware of Friedman and Schwartz’s policy critique and tried to apply the lessons of the Great Depression to the present episode. I suspect, however, that were Friedman and Schwartz writing today they would find the Fed’s efforts wanting in several important ways.

Schwartz, in an interview published in October 2008, criticized the basic thrust of Fed policy in the crisis up until that point. "The Fed," Schwartz argued, "has gone about as if the problem is a shortage of liquidity. That is not the basic problem. The basic problem for the markets is that [uncertainty] that the balance sheets of financial firms are credible." (Carney, 2008)

She also questioned the Fed’s policy stance prior to the crisis. It was, she said, typical of what had gone on in the periods leading up to previous crises: "The particular asset varied from one boom to another. But the basic underlying propagator was too-easy monetary policy and too-low interest rates that induced ordinary people to say, well, it's so cheap to acquire whatever is the object of desire in an asset boom, and go ahead and acquire that object. And then of course if monetary policy tightens, the boom collapses." (Carney, 2008)
A few weeks prior to the publication of the Schwartz interview, an incipient run on money market funds developed that the combined actions of the Federal Reserve and the U.S. Treasury averted. There is no mention of that episode in the interview, very likely because the interview itself was conducted earlier.

In any event, the reserve injections by the Fed then were completely in line with the policies that Friedman and Schwartz claimed should have been followed in the early 1930s. That they have continued for five years thereafter is not.

I strongly suspect that once it became clear that the run was over Friedman and Schwartz would have been advocates for a policy reversal and withdrawal of reserves. I base that conjecture on two factors. The first is the highly favorable treatment that Friedman and Schwartz accorded to the Aldridge-Vreeland Act. Passed by Congress in 1908, following the banking panic and severe recession the year before, it provided for an emergency currency issue by groups of banks with retirement once the crisis was over. The second is Friedman’s long standing skepticism with regard to central bank attempts to influence the real economy.

In this connection Friedman stated in his posthumously published paper “Tradeoffs in Monetary Policy” (Friedman, 2010, p. 116)

In my opinion [the Fed] has one and only one function: to keep the price level steady. The price level and inflation are monetary phenomena. They are defined by what happens to the quantity of money relative to output. Output is a real magnitude, not a monetary magnitude. Treating the Fed as having two separate objectives is an open invitation to engage in fine-tuning, something that has almost always proved a mistaken practice.

Now the Fed faces two problems related to exit strategy.\(^7\) The first is what to do about the huge quantity of excess reserves, which is the same problem faced by the Bank of England

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\(^7\) See Meltzer (2013) for a discussion of these issues in an historical context.
and again to a somewhat lesser extent the ECB.\textsuperscript{8} The second problem that the Fed in particular faces is how to extricate itself from being an agent of government industrial policies. Neither will be at all easy to effect.

\textsuperscript{8} For a discussion of possible alternative strategies, see Thornton (2013).
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Table 1. Means of real policy interest rates by subperiod, 1999-2013

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<td>US</td>
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<td>-0.29</td>
<td>0.0</td>
<td>-1.57</td>
</tr>
<tr>
<td>UK</td>
<td>3.92</td>
<td>2.72</td>
<td>2.5</td>
<td>-2.77</td>
</tr>
<tr>
<td>Euro bloc all</td>
<td>1.12</td>
<td>-0.17</td>
<td>1.1</td>
<td>-0.51</td>
</tr>
<tr>
<td>Euro bloc core</td>
<td>1.66</td>
<td>0.56</td>
<td>1.6</td>
<td>-0.98</td>
</tr>
<tr>
<td>Euro bloc periphery</td>
<td>0.31</td>
<td>-0.87</td>
<td>0.7</td>
<td>-0.61</td>
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</table>
Table 2. Average annual growth in the monetary base and broad money supply

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>UK</th>
<th>Euro area</th>
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<tbody>
<tr>
<td></td>
<td>Base</td>
<td>M2</td>
<td>Base</td>
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<tr>
<td>2008-09</td>
<td>43.37</td>
<td>6.52</td>
<td>51.15</td>
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<tr>
<td>2010-11</td>
<td>12.75</td>
<td>6.36</td>
<td>5.97</td>
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<tr>
<td>2012-13</td>
<td>17.06</td>
<td>6.60</td>
<td>30.35</td>
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</tbody>
</table>
Figure 1a: Euro area, UK and US real policy interest rates
Figure 1b: Euro area real interest rates, core vs. periphery

[Graph showing Euro area real interest rates for core vs. periphery from 1999M01 to 2013M01.]
Figure 2a. Monetary base in the United States, 1999.1 to 2013.3
Figure 2b. Monetary base in the United Kingdom, 1999.1 to 2013.3
Figure 2c. Monetary base in the Euro area, 1999.1 to 2013.3
Figure 3a. Variability in inflation and real GDP growth in the US, 1800-2012
Figure 3b. Variability in inflation and real GDP growth in the UK, 1840-2012
Figure 3c. Variability in inflation and real GDP growth in the Netherlands, 1825-2012
Figure 4a. Variability in real growth and money growth in the US, 1877-2012
Figure 4b. Variability in real growth and money growth in the UK, 1871-2012
Figure 4c. Variability in real growth and money growth in the Netherlands, 1910-2011