HOOVER INSTITUTION
ECONOMICS WORKING PAPERS

Karl Brunner and Allan Meltzer: From Monetary Policy to Monetary Rules[*]

Prepared for the Conference "Karl Brunner and Monetarism"
Swiss National Bank, Zurich, Switzerland, October 29-30, 2018

Michael D Bordo
Rutgers University, Hoover Institution, and NBER

Economics Working Paper 19104

HOOVER INSTITUTION
434 GALVEZ MALL
STANFORD UNIVERSITY
STANFORD, CA 94305-6010
March 1, 2019

Karl Brunner and Allan Meltzer were pioneer monetarists whose work in the 1960s and 1970s challenged the prevailing Keynesian orthodoxy. A major part of their work was a critique of the Federal Reserve System's monetary policy strategy from the 50s leading to the Great inflation. This paper explores the nexus between Brunner and Meltzer's earlier work in a report prepared for the US congress in 1964 on the System's discretionary counter cyclical policy in its first fifty years of existence, and Allan Meltzer's monumental two volume A History of the Federal Reserve (2003, 2009). Many of the themes in the early report reappeared in A History.
A key theme in the 1964 monograph was a critique of the Fed's use of the Net Free Reserves doctrine which had evolved in the 1950s from the earlier Burgess Rieffler Strong doctrine which guided Fed policy in the 1920s and 1930s. which the authors argued explained the Fed's policy mistakes leading to the Great Contraction. They posit the case that their monetarist approach based on the money supply, monetary base and money multiplier could have greatly improved the Fed's performance from the 1920s to the 1960s.The 1964 monograph was a key building block for their later work in monetary theory and policy including their critique of Keynes, the importance of policy uncertainty and the case for a monetary base rule.

Keywords: Federal Reserve, Net Free Reserves Doctrine, Monetary Rules, Allan Meltzer, Karl Brunner, Monetary Policy
JEL Codes: E52, E58, N12

[*] For helpful comments I thank Alan Blinder, Ben Friedman, Hugh Rockoff and David Wheelock.

1. Introduction

Karl Brunner and Allan Meltzer were pioneer monetarists along with Milton Friedman, Anna Schwartz and Clark Warburton[1]. Their path breaking work in the 1960s and 1970s on the relationship between the money supply and output and prices based on the Quantity Theory of Money challenged the prevailing Keynesian orthodoxy. They also effectively criticized the monetary policy strategy of the Federal Reserve System and contributed to the sea change in policy making that occurred under the chairmanship of Paul Volcker in 1979. Their work encompassed monetary theory, monetary policy and monetary history.

In this paper I explore the nexus between their earlier work in a report prepared in 1964 for the U.S. Congress evaluating the Federal Reserve's discretionary countercyclical monetary policy strategy in its first 50 years, and Allan Meltzer's later 2003 and 2010 monumental two volume book *A History of the Federal Reserve* and finally to their case for monetary rules. Many of the key themes in the later Meltzer books were developed earlier by Brunner and Meltzer in their 300 page monograph. These included: the role of the Federal Reserve's incorrect monetary framework in precipitating major failures in monetary policy, especially the Great Contraction from 1929 to 1933 (and later after the monograph was published, the Great Inflation from 1965 to 1983). Brunner and Meltzer blamed the Fed for following the flawed Free Reserves Doctrine which in turn was based on the earlier Burgess Rieffler (Strong) doctrine developed in the 1920s[2]. Brunner and Meltzer (1964) argue that a superior framework based on the monetary base, money supply multiplier and the money supply would have avoided many of these mistakes. To make their case against the Fed's framework the monograph is full of discussions of episodes of Federal Reserve Policy from the 1920s to the 1960s. These episodes appear later in Meltzer's History of the Federal Reserve.

In the 1964 monograph they do not explicitly make the case for a monetary rule as their mandate was to critically evaluate the Fed's discretionary counter cyclical policies. In their later work they make the case for monetary rules based on the Fed's flawed use of forecasts in conducting discretionary monetary policy. This line of research led to Allan Meltzer's 1987 monetary base rule with feedback from the real economy and later to Meltzer's advocacy of the Taylor Rule.

Brunner and Meltzer (1964) also touched base on themes that would appear in their later work including the role of information and uncertainty and the distinction between permanent and transitory shocks. Another theme that first appears in the 1964 monograph is a critique of the concept of the liquidity trap that was at the heart of Keynesian doctrine. Brunner and Meltzer's work on the liquidity trap appeared later in their well-known 1968 JPE article. This work fed into Brunner and Meltzer's Mattioli Lectures (1983) and Meltzer's (1988) book on Keynes. Brunner and Meltzer do not explicitly develop the monetary policy transmission mechanism in their 1964 monograph but the evidence that they marshall against the Fed's policy helped their later work on the Brunner and Meltzer model in the 1970s and 1980s and later their work on the credit channel of monetary policy in the 1990s.

The paper is structured as follows. Section 2 focuses on the 1964 monograph. I develop four themes: their general framework; their critique of the Free Reserves doctrine; their alternative monetary base, money multiplier approach; and their empirical and historical evidence. Section 3 highlights the main themes in Allan Meltzer's *A History of the Federal Reserve*. In section 4 I explore the connection between the 1964 monograph and the later Rules versus Discretion debate. Section 5 concludes with some of the lessons from Brunner and Meltzer's treatment of theory, empirical evidence and narrative monetary history.

2. Brunner and Meltzer (1964) on Federal Reserve Monetary Policy

In 1964 Karl Brunner and Allan Meltzer issued a monograph commissioned by Chairman Wright Patman of the Congress Committee on Banking and Currency. In this lengthy report the authors critically evaluated the framework and operations of the Federal Reserve System in its first fifty years of operation. The questions that the authors posed were: 1) What was the key idea in the Federal Reserve's policy framework?; 2) How did their framework translate into policy?; 3) How did the Fed's framework fare when tested against the experience?[3] The Study was divided into 4 sections: 1. Some General Features of the Federal Reserve Approach to Policy: 2. Free Reserves; 3. The Monetary Base and Money Multiplier Approach; 4. Evidence on the Relationship between the Monetary Base and the Money Supply.

2.1 General Features of the Federal Reserve's Approach to Monetary Policy

In this section of the monograph, Brunner and Meltzer present an overview of the findings of their study. Their evaluation was based on the record available from the Federal Open Market Committee (FOMC), the staffs of the Board of Governors and the Federal Reserve Banks. It was also based on a questionnaire the authors sent to the FOMC members and Reserve bank Presidents. The authors spell out the Fed's framework, criticize it, and compare it both with data and historical experience. They then compare the Fed's framework to their own which is based on the monetary base and the money multiplier.

The key conclusion derived from this study is that the Federal Reserve did not have an effective monetary policy framework. It did not have a viable analysis linking their monetary policy actions to the money supply. Because the Fed did not have an adequate framework of how its policy affects the money supply it did not follow good monetary policy (Brunner and Meltzer 1964a page 9). Later in the monograph the authors attribute the Fed's flawed policy framework to its adherence to various versions of one developed by W.W Rieffler in the 1920s and later extended in the 1930s and 40s by W. Randolph Burgess and Emmanuel A. Goldenweisser.

The reasons given for the Fed's failure as developed throughout the monograph are: 1. The Fed's short-term emphasis (what Allan Meltzer later called "short termism"). 2.The Fed viewed the monetary process from the perspective of a single bank rather than the banking system as a whole.

Brunner and Meltzer argued that the Fed's concern with short-term events had driven out the long-term research needed to develop an effective framework and moreover, a key reason why the Fed mainly focused on short-term factors is because it did not have an understanding of the connection between monetary policy and the money supply or of the money supply to real income and the price level.

The way the Fed operated when Brunner and Meltzer were writing was to adjust commercial banks reserve positions to affect the money market. The Fed's short-term focus was on the “feel and tone” of the market and the level of free reserves. This they argued led the FOMC to give conflicting goals to the Manager of the FOMC desk which in turn gave him considerable discretionary power.

In the Fed’s view, bank reserves and the federal funds rate reacted to market forces and had a large random component. The Manager of the Desk had to separate random from systematic elements. The concepts of “feel” and “tone” were the way the FOMC dealt with this issue. “Feel” meant a set of clues and behavior implications by market professionals which suggests that they understood the relative importance of random and systematic factors. “Tone” meant the Federal Reserve System’s position with respect to its total security holdings (Brunner and Meltzer 1964a page 17). As the authors later argue, focus on the money supply would have reduced the problems that stemmed from the Fed’s short-term focus.

The second critique of the Fed’s operation was its having an individual banker’s view of its operations. As the system operated, member banks needed to smooth fluctuations in their reserves by either borrowing through the federal funds market or accessing the Fed’s discount window. They needed to meet their minimum reserve holdings at the end of every Wednesday or pay a penalty (Brunner and Meltzer 1964a page 20). In the case of member bank borrowing from the Fed, according to the thinking at the time, it would have a negative effect on the banking system because of the Fed’s view of the system through the perspective of an individual bank. By contrast, according to Brunner and Meltzer, borrowed reserves would increase total reserves and hence increase the money supply for the entire banking system (Brunner and Meltzer 1964a page 29).

According to Brunner and Meltzer, the Fed's misconception between individual banks and the banking system is embedded in the Free Reserves Doctrine (the subject of section 2.2).

Moreover the Fed's individual bank perspective led to a confusion between money and credit. It is true for an individual bank that an increase in bank credit would increase the money supply but this does not hold for the banking system as a whole. Shocks to money and to bank credit changed at different rates. If the banking system's reserve to deposit ratio were to rise then the growth rates of money and bank credit would diverge (Brunner and Meltzer 1964a page 31).[4]

The section concludes with a discussion of several important historical episodes when the Fed made major policy mistakes by following its flawed framework: 1936-37; 1949 and 1952-54, which are expanded on in later sections.

Many of the themes raised by Brunner and Meltzer in this section of their monograph reappear in Allan Meltzer's *A History of the Federal Reserve* and other works by the authors.

2.2 Free Reserves

In section 2 of the Congressional Memorandum, Brunner and Meltzer critically evaluate the Free Reserves doctrine that guided Federal Reserve policy making in the post Accord years until the 1970s.[5] Net Free Reserves are defined as excess reserves less member bank borrowing. Brunner and Meltzer first document how the Free Reserve doctrine evolved from the Burgess Rieffler (Strong) doctrine which was developed in the 1920s. According to that doctrine member banks did not borrow for profit but for need, i.e. they did not compare the discount rate to the open market rate to decide whether to go to the discount window, but only turned to the discount window when their reserves were deficient.[6] According to this doctrine low member bank borrowing and low interest rates were a sign of monetary ease while high member bank borrowing and high interest rates was a sign of tightness. Also, according to this doctrine the Fed should use its open market operations to influence member bank borrowing. An open market purchase would induce member banks to repay loans leading to a looser monetary stance and a reduction in interest rates. An open market sale would raise member bank borrowing, reduce the money supply and raise interest rates.[7]

Brunner and Meltzer (1968) and Wheelock (1991) demonstrate how the pursuit of this doctrine in the 1920s and 1930s explained the Fed's major policy mistake leading to the Great Contraction. In the recessions of the 1920s member bank borrowing and short term interest rates performed according to the Burgess Rieffler Doctrine but between 1930 and 1933 it did not. Low member bank borrowing and low interest rates reflected the collapse in economic activity and deflationary expectations.

Later in the 1930s member banks held large excess reserves and member bank borrowing was negligible.[8] This was viewed as inconsistent with the BR doctrine which was then reinterpreted by E A Goldenweiser (1951) to justify the doubling of reserve requirements in 1936 and 1937 on the grounds that member bank borrowing was necessary to make monetary policy effective. Goldenweiser and other Fed officials also argued that the excess reserves represented excess liquidity which if not absorbed by higher reserve requirements would reignite an asset boom like in the 1920s. The BR doctrine was modified in the 1950s to include both excess reserves and member bank borrowing,

Brunner and Meltzer (1964b) examined the published record from the 1950s to show that Free Reserves (FR) were used by the FOMC as both an indicator and a target for monetary policy. They argue that it was misleading in both dimensions and that because the Fed followed the FR doctrine it did not have a coherent theory of how monetary policy operates (page 36). To back this up they first summarized the record of policy actions from 1946 to 1962 based on a scale from +1 to -1 reflecting the degree of ease and tightening. They then show the policy actions that the Fed followed--open market operations, changes in reserve requirements and changes in the discount rate. They then calculate a moving average of free reserves to show the link between announced policy actions and the level of free reserves. They examine the timing of policy actions and their effect on FR. They find that policy actions generally occurred near NBER turning points. A detailed examination of every business cycle from 1953 to 1962 shows that free reserves in most cases rise before the turning point and the policy action taken. This suggests that FR were taken as an indicator by the Fed.

Brunner and Meltzer argue that based on the behavior of FR the manager of the FOMC desk was given considerable discretion to act. The problem with this that they point out is that there is little evidence linking FR to either the money supply or bank credit—variables that are crucial to monetary policy having an impact on prices and output. Evidence for this is based on a study by James Meigs (1962) and their own calculations. Meigs distinguished between desired and actual FR. In his model commercial banks (demand for) free reserves depends on market conditions, especially interest rates. Moreover the adjustment of actual to desired reserves leads to changes in the money supply. His empirical evidence shows that an increase in FR had a negative effect on the growth of demand deposits. This result is contrary to the Fed's interpretation of FR as an indicator of ease (B and M 1964b page 54). An increase in FR can be consistent with an increase in excess reserves or a decline in member bank borrowing which in turn is associated with a decline in the growth of demand deposits. Moreover Meigs results are opposite to the Burgess Rieffler view. He finds that open market operations produce the same effect on the growth of demand deposits regardless of whether they work through borrowed or nonborrowed reserves. Brunner and Meltzer themselves calculate the coefficient of determination between FR, Treasury bill yields, M1 and bank credit. They find a closer correlation between changes in FR and interest rates than between changes in FR and changes in M1. Moreover they find little correlation between changes in FR and changes in M1 or bank credit.

Based on their evidence and that of Meigs (1962,) Brunner and Meltzer stated "free reserves must be abandoned as an indicator of a monetary situation and as a target of monetary policy." (Band M 1964b page 63).

2.3 Brunner and Meltzer's Alternative Approach to the Monetary Mechanism

In their third submission to the House subcommittee Brunner and Meltzer (1964) spell out their alternative approach to the monetary mechanism based on the monetary base and the money supply. This approach they argue can better stabilize the business cycle than the Federal Reserve's Free Reserves approach (Brunner and Meltzer1964c page 2).

In their approach, the money supply is determined by three sets of actors: the Federal Reserve; the nonbank public and the commercial banks. Monetary policy actions via open market operations or changes in the discount rate or changes in reserve requirements lead to changes in the monetary base (defined as currency plus reserves). The base interacts with the money multiplier which in turn is determined by the public's currency money ratio, the ratio of time deposits to demand deposits, and the commercial banks reserve to deposit ratio (aka the demand for currency, the demand for demand and time deposits and the demand for reserves). Each of the determinants of the money multiplier in turn depend on economic choice variables, especially interest rates.

Monetary policy actions such as open market purchases increase the reserves of the banking system. This leads to surplus reserves relative to the banks' desired excess reserves (held to deal with potential reserve deficiencies). The banking system responds to the surplus of reserves via a portfolio adjustment mechanism which works through the money multiplier. The increase in reserves leads banks to increase their lending which increases their deposits. The public drains off some of the increased deposits into currency holdings. The process works through a series of ever diminishing injections of deposits until in equilibrium the money supply increases by a multiple of the change in the monetary base. Other monetary policy actions produce similar effects. Brunner and Meltzer (1964c) view their model as superior to the Federal Reserve's measure of the money multiplier which does not account for the effects of currency drains.

The authors rearrange the Fed's balance sheet to identify the uses and sources of the monetary base. The uses are currency and reserves. The sources include: Federal Reserve credit, discount window advances, the monetary gold stock, Treasury cash and float. This demarcation allows the authors to analyze the historical sources of Fed operations. The monetary gold stock and Federal Reserve credit were dominant sources of change dominating over most of the fifty years of Fed history covered in their study but the discount window was of key importance in the 1920s.[9]

The authors then use their approach to evaluate the history of Federal Reserve Policy actions. Highlights include:

1. The Fed's discount rate policy amplified the business cycle in the 1920s;

2.Like Friedman and Schwartz (1963) Wicker (2004) they attribute the banking panics of the 1930s to currency drains not being offset by open market operations (Brunner and Meltzer 1964c page 23);

3. They attribute the collapse in the money supply in the 1937-38 recession to the consequence of the Fed's doubling of reserve requirements in 1936-37. Like Friedman and Schwartz (1963) and Meigs (1962) they argue that the banks were holding large excess reserves in reaction to the bank failures of the 1930s. When the Fed doubled reserve requirements this just led the banks to increase their excess reserves further reducing bank lending and the money supply.

4. They criticize the Keynesian view that there was a liquidity trap in bank reserves in the 1930s seen in the increase in excess reserves. According to this view the pursuit of expansionary monetary policy would be like "pushing on a string" because the money

supply would endogenously react fully to a change in national income. Brunner and Meltzer (1964c) like Friedman and Schwartz (1963) and Cagan (1965) demonstrate that although the banking system's reserve holdings and hence the money multiplier is a function of market interest rates which are determined in the real economy, that the feedback effect from the economy to the money supply is offset by policy induced exogenous changes in the monetary base.[10],[11].

5. They attribute the increase in the currency money ratio during World War II to large increases in labor mobility (Brunner and Meltzer (1964c) page 25).[12] They also explain how the Fed monetized government debt in the war by purchasing new Treasury securities and how the Fed pegged interest rates from the mid 1930s to the Accord in 1951 In terms of their framework.

6. Brunner and Meltzer 1964c extend the analysis in the previous section (Brunner and Meltzer (1964b)), by comparing the Fed's Free Reserve Approach to monetary policy to their monetary base money multiplier approach. According to the Fed's view an increase in member bank borrowing is deflationary while a larger supply of excess reserves is inflationary. In the Brunner Meltzer view an increase in member bank borrowing increases the monetary base, the money supply and the price level (Brunner and Meltzer 1964c page 35).

Thus in this chapter, many of the historical building blocks in Allan Meltzer's *A History of the Federal Reserve* were already put in place four decades earlier.

2.4 The Monetary Base and the Money Supply

In this section (Brunner and Meltzer (1964d)) present empirical evidence based on quarterly data from 1949-1962 running a race between the monetary base and free reserves as determining the money supply. Using the coefficient of determination they find a high correlation between changes in the monetary base and changes in the money supply (M1) versus a very low correlation between changes in free reserves and changes in M1. They then analyze Fed policy actions between 1946 and 1961 comparing their base approach with the Fed's monetary base approach. In several episodes including the recession of 1949, they show that the Fed misinterpreted their policy actions based on its focus on free reserves. In each case movements in the base explained what happened to the real economy, but free reserves did not. Their examination of the behavior of the monetary base in four post war business cycles showed that in every case the economy turned down after the monetary base was tightened. In every case, the indicator the Fed looked at, the level of free reserves, increased[13],

Thus Brunner and Meltzer make their case that had the Fed followed their approach based on the monetary base, the money multiplier and the money supply, that the Fed could have performed better in its countercyclical monetary policy. The key reason the Fed had such a poor track record was that it followed a flawed framework (Brunner and Meltzer 1964 d page 75). This as we argue in section 4 below was the key lesson in Allan Meltzer's *A History of the Federal Reserve*.

3. Brunner and Meltzer on Rules Versus Discretion

The debate over rules versus discretion in monetary policy has raged ever since the early nineteenth century.[14] Karl Brunner and Alan Meltzer have long been advocates of monetary rules along with Milton Friedman, Anna J Schwartz and other monetarists. The 1964 monograph did not deal directly with the issue because its mandate was to evaluate the Federal Reserve's countercyclical monetary policy. Brunner and Meltzer advocated the use of the monetary base and the money supply as a framework that would lead to better policy outcomes but they did not come out directly in favor of a monetary rule as they would do in subsequent decades. The evidence that they presented of poor Federal Reserve performance in its first 50 years echoes and complements Milton Friedman's case for his constant growth rate of the money supply rule, first formulated in *A Program for Monetary Stability* (1960).

In the 1970s and 1980s Brunner and Meltzer along with other members of the Shadow Open Market Committee founded in 1973, advocated the pursuit of a rules based monetary policy. They argued that discretionary policy could only succeed if the monetary authority had full knowledge of the determinants and stochastic structure of the economy. Karl Brunner (1983) argued "A constant monetary growth regime (is)… an optimal risk-minimizing strategy in a state of uncertain and shifting information."[15]

The Shadow developed a policy rule for the steady state growth rate of the monetary base adjusted for permanent changes in economic growth or velocity. The SOMC rule also posited that the adjustment of the growth rate of the monetary base to its steady state target should be gradual and publically announced.[16]

Later in the 1980s Brunner and Meltzer developed a new critique of discretionary monetary policy based on uncertainty about information and its interpretation (Brunner and Meltzer 1993 page 171). They argue that forecasts of the macro variables on which discretionary policy is based are unreliable and subject to large forecast errors reflecting unpredictable random shocks that hit the economy. These include technology shocks and unexpected policy actions. Policy uncertainty can reflect mistaking transitory for permanent changes, misinterpreting nominal shocks as real shocks, as well as basing decisions on unreliable forecasts.

In several articles in the 1980s summarized in the Mattioli Lectures (1993) the authors compare forecast errors for inflation and output growth between rules based and discretionary regimes across countries. They distinguish between countries and episodes in the 1970s and 1980s where the monetary authorities focused on money growth targets and those which did not. They also distinguished between fixed and floating exchange rate episodes. The methodology they followed was the Multi State Kalman Filter (Bomhoff 1983) which can distinguish between permanent and transitory shocks. They find that countries that followed floating rate regimes along with monetary targets had lower forecast errors (in the transitory component) revealed by the Kalman filter than countries with fixed exchange rates. In 1987 Allan Meltzer developed his own adaptive monetary base rule with feedback from the real economy. In Meltzer's rule, the growth of the monetary base would achieve price stability by setting the growth of the base equal to the difference between a moving average of output growth and a moving average of the growth of base velocity (Meltzer 1987).[17]

In the 1990s central banks and the economics profession shifted away from monetary aggregate rules towards interest rate rules and especially the Taylor Rule (1993). Allan Meltzer (2014) in one of his last papers strongly advocated rules based policy based on the Taylor Rule.

4. Allan Meltzer and the History of the Federal Reserve

5. 4.1 Introduction

Allan Meltzer, four decades after the monograph with Karl Brunner, came back to many of its themes in his monumental two volume *A History of the Federal Reserve 1913 to 1986* (2003 and 2009). The book is a biography of the Federal Reserve as an institution, i.e. of the decision making by its leaders, rather than as a monetary history per se as was done by Friedman and Schwartz (1963). Meltzer's analytical approach encompassed much more than the tenets of established monetary theory but also political economy, especially the complex interactions between the government (Administration, Treasury and Congress) and the Federal Reserve. To understand the books and its emphasis on flawed doctrine (and political impingement on central bank independence), in addition to Brunner and Meltzer (1964), it is important to read chapter two of Volume I because it gives a thorough history of classical monetary doctrine as espoused by Henry Thornton, Walter Bagehot and Irving Fisher. These economists presented the fundamentals of monetary economics and especially the relationship between central bank policies and the macro economy (prices, output and exchange rates) under fixed and floating rates, the case for rules over discretion, the rules for a lender of last resort, and the distinction between nominal and real interest rate. These fundamentals were at the heart of the Fed's failures and successes. Meltzer argues that had the Fed followed classical monetary theory (and its modern offshoots) it could have avoided its three big failures: the Great Contraction 1929-33; the Great Inflation 1965 to 1982; and the recent Great Financial Crisis 2007-2008. Moreover the Fed's two great triumphs (Paul Volcker's successful disinflation 1979 to 1982 and the Great Moderation 1985 to 2001) reflected the pursuit of sound monetary principles. I briefly provide a highly selective guided tour of *A History*.

4.2 Narrative Volume I 1913 to 1951

The Federal Reserve System (FRS) was founded in 1913 as an independent central bank based on the principals of the real bills doctrine and the gold standard. Monetary policy was supposed to be conducted like the Bank of England in the pre-World War I era with the Fed passively rediscounting eligible commercial paper at the discount rate. The FRS was a compromise between the interests of the Northeast financial centers who wanted a European style central bank and the rest of the country that wanted local reserve banks dedicated to accommodating regional credit needs. World War I changed the environment drastically. Most countries suspended the gold standard, and the Fed lost its independence to serve as the financier of the Treasury by lending at preferential rates to finance the purchase of Treasury securities. It became an engine of inflation. After the war the Fed followed the Bank of England's approach of raising its discount rate to roll back the large run-up in inflation. The resultant political backlash to the severe recession of 1920-21 led the Fed to look for a new form of monetary control based on open market operations.

The new approach to monetary policy was laid out in the Tenth Annual Report of the Federal Reserve in 1923. Meltzer, following Brunner and Meltzer (1964 and 1968) explain how the

Burgess Rieffler (BR) doctrine was a derivative of the real bills doctrine and how it became the source of serious policy errors in the succeeding years. As discussed above, the premise for BR was that member banks were reluctant to turn to the discount window, and so the Fed would use its open market operations to force them to the window when the economy was in recession and repay loans when the economy was strong. Two indicators of the stance of the economy were: the levels of member bank borrowing in the two key Reserve cities, New York and Chicago; and the level of short term nominal interest rates. Meltzer is critical of this approach because it assumes that banks only borrow when in need and not to make profits and because it does not account for the difference between nominal and real interest rates. Volume I analyzes the Federal Reserve's policy actions through the lens of the BR doctrine. Meltzer shows that the doctrine did work in two minor recessions in the 1920s but failed miserably between 1930-33 because the two indicators provided misleading signals that the economy was in good shape when it was not. Member bank borrowing was low because the economy was depressed and nominal interest rates were low reflecting expectations of deflation. Meltzer also blames the Fed for creating the depression in the first place in 1929 by using tight monetary policy to prick the 1920s Wall Street boom. This was done on real bills grounds that asset price inflation would eventually lead to general inflation and deflation.

A key signature of Volume I is that unlike Friedman and Schwartz (1963), Meltzer does not blame the Fed's failure to prevent the banking panics on deep flaws in the Fed's governance structure (the struggle between the Reserve banks and the Board) and the fact that Benjamin Strong, who led the system until 1928, had died and there was no comparable successor. He argued that Strong also followed the BR doctrine and would have made the same mistakes as the other officials did. Thus for Meltzer, as was the case with Brunner and Meltzer (1964), bad doctrine was the key cause of the Fed's first calamitous policy failure.

In the mid-1930s, major reforms in the Bank acts of 1933 and 1935 gave the Federal Reserve board much more power and independence de jure but de facto the Fed became subservient to the Treasury and followed a bond support policy to keep interest rates low to help the Treasury finance its deficits. He also showed how the monetary reflation that occurred after the end of the Great Contraction in 1933 was solely attributable to expansionary Treasury gold purchases policies and the devaluation policy of the dollar in 1934.[18] The one time that the Fed did take serious policy action was in 1936 -37 when on BR grounds the Fed doubled member banks' reserve requirements to eliminate a build-up in excess reserves. This led to the serious recession of 1937-38. Here Meltzer follows Brunner and Meltzer (1964) quite closely.

The recovery was aided by the Treasury rescinding its sterilization of gold inflows (originally imposed in 1936 to prevent the accumulation of excess reserves). During World War II the Fed followed the Treasury's lead and pegged bond prices, acting as it did in World War I as an engine of inflation. After the war the interest rate peg regime continued under Treasury's control. Meltzer brilliantly documented the struggle that began in the late 1940s between the Fed and the Treasury and the administration to end the interest rate pegs and restore the Fed's independence. The Fed recovered control of monetary policy in the Federal Reserve Treasury Accord of February 1951 which ends Volume I of *A History*.

4.3 Narrative Volume II.

Volume II begins with William McChesney Martin becoming Chairman of the Federal Reserve in 1951 and the system returning to active monetary policy making.[19] Meltzer documented how after the Fed regained its independence it reverted back to its old procedures of focusing on money market indicators and a variant of the BR doctrine , the targeting of net free reserves. As he and Karl Brunner had pointed out in the 1964 monograph, the NFR doctrine led to serious errors in Fed policy making in the 1950s and 1960s.

Meltzer was highly critical of Martin's tutelage—for his limited understanding of monetary economics (his use of nautical terms e.g. "leaning against the wind") for his conception of the Fed's independence ("independent within government") which meant that monetary policy was secondary to fiscal policy, and to his later acceptance of the Phillips curve and Keynesian doctrine. Meltzer disagreed with Christina and David Romer (2002) who viewed the 1950s as a period of great success for the Fed. He argued that the only reason the macro economy performed so well was that the Eisenhower administration and later the early Keynesian administration were relatively fiscally conservative and believed in balanced budgets, the importance of adhering to the Bretton Woods gold constraint, and price stability. Had they ran big fiscal deficits he believed that Martin would have accommodated them.

Meltzer then documented how the Great Inflation began under Martin in 1965. He focused on the ascendency of Keynesian views in the Kennedy administration in the 1962 Council of Economic Advisors and then within the Federal Reserve Staff and FOMC, the belief in the superior performance of fiscal over monetary policy, the use of fine tuning stabilization policy, the adoption of the Phillips curve tradeoff between inflation and unemployment. The Fed followed an influential article by Samuelson and Solow (1960) on the Phillips curve which argued that the benefits of reducing inflation outweighed the costs of raising inflation. This meant that the weights the Fed attached to inflation and real growth in its policy reaction function between the 1950s and 1960s shifted away from price stability toward growth. When Lyndon Baines Johnson became President in 1963 the administration shifted to an expansionary fiscal policy to finance burgeoning domestic programs and the Vietnam war.[20] The Martin Fed accommodated the Treasury via the use of "even keel" policy and by the increasing reluctance to raise rates in the face of incipient inflationary pressure for fear of thwarting the Administration's plans[21]. This set the stage for the Great Inflation.

Another theme in both Volumes but especially in Volume 2 is the international economy. The Bretton Woods system was the international monetary regime from 1945 to 1973 and the book discussed the influence of the balance of payments and the level of US gold reserves on Fed decision making. The decline in the US monetary gold stock became particularly worrisome after the Western European countries declared current account convertibility in December 1958. After a spike in the price of gold in October 1960 (based on fear that when Kennedy became elected he would follow expansionary fiscal policies) the Kennedy Administration and the Fed began adopting policies to preserve gold. The Fed's key policies in this period were the creation of swap lines with other central banks and Operation Twist.[22] In the early 1960s the FOMC in its policy deliberations, on occasion, took into account the balance of payments and gold reserves in its domestic policy making.[23] Gold and the dollar also provided a reason for a number of Fed officials to maintain price stability. But after 1965 the

Fed’s policy became increasingly dominated by domestic concerns. This created another factor behind the Great Inflation.

Arthur Burns succeeded Martin as Fed chairman in 1970. Meltzer was especially critical of his regime, in part because as a well -respected economist he should have known better. He described how Burns was increasingly unwilling to tighten monetary policy to stem the rise in inflation and inflationary expectations because of his fear of the political consequences of the recession that would follow. He also was subservient to the political ambitions of both Presidents Nixon and Carter. The Burns era is a key example of one of the great flaws in the Fed’s record in being fiscally dominated. Burns also subscribed to the importance of non -monetary forces (especially the two oil price shocks and labor union power) and he was instrumental in the US adopting wage price controls in the 1970s which led to disastrous consequences. Burns was also responsible for the accommodation of the two oil price shocks which further increased inflation. In addition, Meltzer criticized Burns for not recognizing the Important distinction between nominal and real interest rates. The Fed believed that rising nominal rates were evidence of tight money when in fact they just incorporated expectations of rising inflation.

President Carter replaced Burns by G. William Miller in March 1978 but he was even worse than Burns and only lasted a bit more than a year. By 1978 the US was in the midst of a major economic crisis: inflation was in double digits, unemployment was rising; the dollar was collapsing and there was increased financial instability reflecting the interaction between rising inflation and financial controls like regulation Q. Meltzer viewed that period as the consequence of disastrous policy mistakes by the Federal Reserve comparable to the Great Contraction of 1929-33.

President Carter appointed Paul Volcker to be Fed chairman in the summer of 1979 with a mandate to break the back of inflation and inflationary expectations. Meltzer praised Carter for that decision. The Volcker disinflation began with a major policy regime change in October 1979 when the Fed shifted from using interest rates as its policy instrument to monetary aggregates (non borrowed reserves). Meltzer gave Paul Volcker the highest praise for following sound monetary principles and successfully ending the Great Inflation. The process was painful. It involved two recessions and a rise in unemployment well above 10 per cent. Regaining credibility for low inflation was hampered by the Carter credit controls in 1980. In addition to Volcker's astute guidance, Meltzer also praised the Reagan administration for backing Volcker's actions, in sharp contrast to the political interference of the 1960s and 1970s. Volume 2 ends after low inflation was restored in the mid 1980s and Alan Greenspan succeeded Volcker as chairman of the Federal Reserve.

In an Epilogue written in 2010, Allan Meltzer covered the period 1986 to 2010. He gave high marks to Chairman Allan Greenspan for the Great Moderation—a period with low and stable inflation and high and stable economic growth—for following rule like monetary policy to maintain credibility for low inflation.

Allan Meltzer criticized the Fed for shifting back to its old way beginning in 2001 by keeping its policy rate well below the Taylor rule rate in a bogus attempt to prevent the emergence of Japan style deflation in the U.S., thereby fueling a housing boom which led to the Great Financial Crisis (GFC) of 2007-2008. Meltzer viewed the GFC as equivalent to the two previous

Federal Reserve major policy errors in the twentieth century. He criticized the Fed under Chairman Ben Bernanke for its handling of the financial crisis: in violating Bagehot's rule, inconsistently bailing out Bear Stearns in March 2008 and letting Lehman Brothers fail in September;[24] in following credit policy which threatened its independence;[25] and in shifting to discretionary policy with the adoption of Quantitative Easing and Forward Guidance in late 2008.

6. Conclusion

Karl Brunner and Allan Meltzer had long and lustrous careers. Their work in monetary economics had an enormous impact on the economics profession and in policymaking around the world. Brunner and Meltzer, along with Milton Friedman and Anna Schwartz, were at the forefront of the monetarist counter revolution against the prevailing Keynesian orthodoxy of the 1950s to 1970s and they led to the Federal Reserve, the Bundesbank, Swiss National Bank, Bank of England and other central banks adopting credible rules based monetary policy dedicated foremost to price stability. Brunner and Meltzer's 1964 monograph evaluating the Federal Reserve's first fifty years was an important building block in the monetarist case against the Federal Reserve's discretionary stabilization policy.

It complemented Milton Friedman's work along with that of his students and coauthors (Anna Schwartz, Phillip Cagan, David Meiselman, James Meigs and others. This monograph complemented and strengthened the theoretical case Friedman (1953, 1960) made on the perils of countercyclical monetary policy, and the historical and empirical evidence in Friedman and Schwartz *A Monetary History of the United States* (1963a) and *Money and Business Cycles* (1963b). This is evident in Brunner and Meltzer's (1964) focus on the flawed Free Reserves doctrine at the heart of the Fed's failures as well as their historical and empirical evidence backing up their case against the Fed's approach, while confirming their own monetarist monetary policy framework built on the monetary base, the money multiplier and the money supply.

Brunner and Meltzer's (1964) monograph was a building block to much of their later work (mainly not discussed in this paper). This includes the Brunner Meltzer model of the transmission mechanism (1972), their work on the origins of money (1971), on uncertainty (1993) on monetary rules (1987, 1993), on the demand and supply for money function (1964), and their analysis of Keynesian economics (1988).

The key legacy emphasized in this paper is to Allan Meltzer's two volume *A History of the Federal Reserve 1913 to 1986* written after Karl Brunner's death. This highly acclaimed book has emerged as the definitive biography of that institution.[26] As I point out in this paper the narrative treatment of many of the episodes as well as evidence in Meltzer (2003) Volume I followed from material in Brunner and Meltzer (1964).

In *A History* Allan Meltzer gave two key reasons to explain why the Fed did so poorly in its monumental failures and so well in its triumphs. These are: a) sound monetary doctrine /theory; b) political pressure (the loss of independence from the government). Reason a) dominated the Great Depression; reasons a) and b) were behind the Great Inflation. He argued that both factors also were present in the Great Financial Crisis. Brunner and Meltzer wrote their monograph in 1964 just before the Great Inflation. Their critique of the Fed in its first 50 years emphasized reason a) and that is the explanation taken by Meltzer in Volume 1.

Allan Meltzer's key prescription for successful central bank policy is to follow rule based monetary policy, a rule based lender of last resort policy, to focus on the medium to long term and to avoid short-termism and fine tuning. These are the principles posited by Thornton, Bagehot and Fisher that Meltzer emphasizes in chapter 2 Volume 1. Many of them also appeared in the original Brunner and Meltzer's (1964) monograph. The Brunner Meltzer vision encompassing over five decades, and a massive number of writings, followed through on their original conception.

References

Robert Auerbach (1969) The Income Effects of the Government Deficit. PhD Dissertation. University of Chicago

Laurence M Ball (2018) *The Fed and Lehman Brothers: Setting the Record Straight on a* Financial *Disaster*. New York: Cambridge University Press.

Eduard Bomhoff (1983) *Monetary Uncertainty*. Amsterdam: North Holland Press.

Michael D Bordo (2019) "Rules versus Discretion: A Perennial Theme in Monetary Economics" chapter 2 in *The Historical Performance of the Federal Reserve: The Importance of Rules*. Stanford CA: Hoover Institution Press

Michael D. Bordo (2018). "The Imbalances of the Bretton Woods System 1965 to 1973: U.S. Inflation, The Elephant in the Room" Paper presented at the World Economic History Association Conference. Cambridge Mass, July

Michael D Bordo (1972) "The Effects of the Sources of Change in the Money Supply on the Level of Economic Activity" PhD Dissertation. University of Chicago

Michael Bordo, Owen Humpage and Anna J Schwartz (2015) *Strained Relations: U.S. Foreign-Exchange Operations and Monetary Policy in the Twentieth Century*. Chicago: University of Chicago Press for the National Bureau of Economic Research

Michael D Bordo and Barry Eichengreen (2013) “Bretton Woods and the Great Inflation” chapter 8 in Michael D Bordo and Athanasios Orphanides (eds) *The Great Inflation: The Rebirth of Modern Central Banking*. Chicago; University of Chicago Press for the National Bureau of Economic Research

Michael D Bordo (2006) “Review of a History of the Federal Reserve Vol I by Allan H. Meltzer” Journal *of Monetary Economics*. Vol 53 No.3. April pp 633-657.

Michael D Bordo and Anna Schwartz (1979) “Clark Warburton: Pioneer Monetarist" *Journal of Monetary Economics*. Vol. 5, No.1.

Karl Brunner (1983) “Has Monetarism Failed" *Cato Journal* 3(1); 23-62.

Karl Brunner and Allan H. Meltzer (1993). *Money and the Economy: Issues in Monetary Analysis*. New York: Cambridge University Press for the Raffaele Mattioli Foundation.

Karl Brunner and Allan H. Meltzer (1972) “Money, Debt and Economic Activity” Journal of Political Economy 80 (September/ October) pp 951-977.

Karl Brunner and Allan Meltzer (1971), “The Uses of Money: Money in the Theory of an Exchange Economy” *American Economic Review* Vol. 61. No.5 pp 784-805

Karl Brunner and Allan H. Meltzer (1968a) “What Did We Learn from the Monetary Experience of the United States in the Great Depression” *Canadian Journal of Economics* 1, pp 334-348.

Karl Brunner and Allan H. Meltzer (1968b)” Liquidity Traps for Money, Bank Credit, and Interest Rates” *Journal of Political Economy* 76 (Jan/Feb) pp1-37.

Karl Brunner and Allan H Meltzer (1964) "Some Further Investigations of the Demand and Supply functions for Money" *Journal of Finance*

Karl Brunner and Allan H. Meltzer (1964a) " Some General Features of the Federal Reserve's Approach to Policy; a Staff Analysis", Subcommittee on Domestic Finance, Committee on Banking and Currency, House of Representatives 88th Congress , 2d session. February 10.

Karl Brunner and Allan h. Meltzer (1964b) "The Federal Reserve's Attachment to the Free Reserve Concept: A Staff Analysis", Subcommittee on Domestic Finance, Committee on Banking and Currency, House of Representatives, 88th Congress, 2d May 7.

Karl Brunner and Allan H. Meltzer (1964c) " An Alternative Approach to the Monetary Mechanism" Subcommittee on Domestic Finance, Committee on Banking and Currency, House of Representatives, 88th Congress, 2d Session, August 17

Karl Brunner and Allan H. Meltzer (1964d)" Some Evidence on the Relationship of the Monetary Base to the Supply of Money" Subcommittee on Domestic finance, Committee on Banking and Currency, House of Representatives , 88th Congress, 2d , August 17

W. Randolph Burgess (1936) *The Reserve Banks and the Money Market. 2nd edition*. New York: Harper

Philip Cagan (1965) *Determinants and Effects of Changes in the Stock of Money, 1875-1960*. New York: Columbia University Press for the National Bureau of Economic Research

Charles W. Calomiris and David C. Wheelock (1998) "Was the Great Depression a watershed for American Economic Policy? Chapter in Michael D Bordo, Claudia Goldin and Eugene N White (eds) *The Defining Moment: The Great Depression and the American Economy in the* Twentieth *Century*. Chicago; University of Chicago Press for the National Bureau of Economic Research

Thomas Cargill (2011) “Meltzer’s History of the Federal Reserve: A Review Essay" *International Finance*

Sebastian Edwards (2018) *American Default: The Untold Story of FDR, the Supreme Court and the Battle over Gold*. Princeton; Princeton University Press.

Milton Friedman and Anna J Schwartz (1963a) *A Monetary History of the United States 1867 to 1960.* Princeton: Princeton University Press

Milton Friedman and Anna J Schwartz (1963b) “Money and Business Cycles” *Review of Economics and Statistics.*

Milton Friedman (1960) *A Program for Monetary Stability.* New York: Fordham University Press

Milton Friedman (1953) “. The Effects of a Full –Employment Policy on Economic Stability: a Formal Analysis” in Milton Friedman .*Essays in Positive Economics*. Chicago: University of Chicago Press. Pp 117-132.

Emanuel A. Goldenweiser (1951) American *Monetary Policy*. New York: McGraw Hill for the Committee on Economic Development

Marvin Goodfriend (2014) “Lessons from a Century of Fed Policy: Why Monetary and Credit Policies Need Rules and Boundaries”; in *Frameworks for Central banking in the Next Century: a Special Issue on the Occasion of the Founding of Federal Reserve*. *Journal of Economic Dynamics and Control.* December

Owen Humpage (2015) “Even Keel and the Great Inflation” Federal Reserve Bank of Cleveland working Paper 15:32. December

David Laidler (2003) “Meltzer’s History of the Federal Reserve” *Journal of Economic Literature* Volume 41 (4) December, pp 1256-1271.

Bennett T. McCallum (1984) “Monetary Rules in the Light of Recent Experience” *American Economic Review, Papers and Proceedings* 74, May, pp388-96.

James Meigs (1962) *Free Reserves and the Money Supply*. Chicago: University of Chicago Press

Allan H. Meltzer (2015) “Karl Brunner, Scholar: an Appreciation” Economics Working Paper 15116. Stanford: Hoover Institution.

Allan H. Meltzer (2014) “Current Lessons From the Past: How the Fed Repeats its History” *Cato Journal*. Vol. 34. No.3 (Fall)

Allan H. Meltzer (2009) *A History of the Federal Reserve Vol 2, 1951-1986*. Chicago: University of Chicago Press.

Allan H. Meltzer (2003) *A History of the Federal Reserve, Vol I: 1913:1951*. Chicago: University of Chicago Press.

Allan H. Meltzer (1988) Keynes’s *Monetary Theory: a Different Interpretation*. Cambridge: Cambridge University Press

Allan H. Meltzer (1988) “On Monetary Stability and Monetary Reform” Third International Conference of The Institute for Monetary and Economic Studies. Tokyo: Bank of Japan. June

Nicholas Kaldor (1970) “The New Monetarism” *Lloyd’s Bank Review*, July pp1-15.

William Poole, Robert A Rasche, and David C. Wheelock (2013) “The Great inflation; Did the Shadow Know Better? Chapter 1 in Michael D Bordo and Athanasios Orphanides (eds) *The Great Inflation: The Rebirth of Modern Central Banking*. Chicago: University of Chicago Press for the National Bureau of Economic Research. Pp 61-116

William Poole (1970) “Optimal Choice of Monetary Policy instruments in a Simple Stochastic Macro Model" Quarterly *Journal of Economics* Vol. 84, No.2 (May) pp 197-216.

W.W. Rieffler (1930) *Money Rates and Money Markets in the United States*. New York: Harper.

Christina Romer and David Romer (2002) “A Rehabilitation of Monetary Policy in the 1950s” *American Economic Association Papers and Proceedings*. Vol 92. Number 2 (May) pp 121-127

Paul Samuelson and Robert Solow (1960) “Analytical Aspects of Anti-Inflation Policy" *American Economic Review* Volume 50 pp177-194.

John B. Taylor (2011) “ Review of Allan H. Meltzer’s A History of the Federal Reserve, Volume 2, University of Chicago Press,2009” *Journal of Monetary Economics* . Vol 58 No.9, pp 183-189.

John Taylor (1993) “Discretion Versus Rules in Practice” *Carnegie Rochester Conference Series in Public Policy* Vol 39 pp 195-214

James Tobin (1970) “Money and Income: Post Hoc Ergo Propter Hoc” *Quarterly Journal of Economics* Vol 84 No.1 (May) pp 301-317

David C. Wheelock (1991) *The Strategy and Consistency of Federal Reserve Monetary Policy 1929-1933.* New York: Cambridge University Press

Elmus Wicker (2004) *The Banking Panics of the Great Depression*. New York: Cambridge University Press

[1] On Warburton's contribution see Bordo and Schwartz (1980).
[2] In Brunner and Meltzer (1964) they call it the Burgess Rieffler doctrine, in their 1968 CJE article they call it the Burgess Rieffler Strong doctrine then in Meltzer (2003) it is back to Burgess Rieffler.
[3] Meltzer (2015) revisited this work in an appreciation of Karl Brunner.
[4] Another issue covered in Section 1 is the Fed's competing and confusing concepts of liquidity.
[5] See Calomiris and Wheelock (1998) on the persistence of the doctrine.
[6] Meltzer (2003) argues that the evidence does not support this view.
[7] Brunner and Meltzer distinguish between the views of Burgess and Rieffler.
[8] This, according to Brunner and Meltzer, reflected the massive increase in bank failures in the early 1930s.
[9] See Auerbach (1969) and Bordo (1972) for related historical studies of the sources of change in the money supply.
[10] The Keynesian response to Friedman on this issue by Kaldor (1969) and Tobin (1970) subsequently generated an enormous literature which continues to this day.
[11] In section 4 Brunner and Meltzer (1964) test the liquidity trap hypothesis in the 1930s. They find that an increase in the monetary base by $1 billion increased M1 by $1.25 billion and the feedback effect from income to money was very small. Brunner and Meltzer (1968) greatly amplify this evidence.
[12] See Cagan (1965).
[13] Brunner and Meltzer (1964) in several places made a distinction between net free reserves and expanded net free reserves. The latter concept applied to the early 1960s. Expanded net free reserves included both net free reserves and short term interest rates. The authors were critical of the use of both variables as indicators and as tools.
The evolution of the Fed's concept of net free reserves likely reflected the Fed's post Accord return to using short term interest rates as their policy tool and indicator. Thus NFR can be viewed as a measure of money market conditions and as a transition concept used by the Fed as it moved towards its interest rates approach.
One conjecture is that for political reasons they did not want to have to admit –to Congress (or to the monetarists?)—that they were directly setting interest rates. They saw NFR as equivalent with a virtually one to one correspondence (at any given time) between the level of NFR that they would set and the federal funds rate that the market would establish. Thus it was in a sense a backdoor way of setting the short-term interest rate but for political reasons it was preferable. I thank Ben Friedman for this point.
William Poole (1971) gave the first clear explanation of the optimal choice the Fed faced between interest rates and monetary aggregates. He argued that the choice of policy tool depended on the sources of the shocks facing the policy maker. If shocks were to money demand (the LM curve) then the optimal tool is to use the interest rate whereas if shocks were to aggregate demand (the IS curve) then the case could be made for the use of monetary aggregates. This distinction was not clear in Brunner and Meltzer's (1964) manuscript.
[14] See chapter 2 in Bordo (2019) for a detailed survey.
[15] See Poole, Rasche, and Wheelock (2013) page 68.
[16] Ibid page 72

[17] Meltzer's rule was quite similar to Bennett McCallum's rule (1984)
[18] See Edwards (2018).
[19] See Taylor (2012) for an excellent review.
[20] See Bordo (2018)
[21] For an alternative view see Humpage (2017)
[22] See Bordo, Humpage and Schwartz (2015)
[23] See Bordo and Eichengreen (2013)
[24] See Ball (2018) who backs up this view.
[25] See Goodfriend (2014)
[26] See reviews by Bordo (2005), Taylor (2012), Laidler (2003), Cargill (2011) and others.