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# The Impact of Milton Friedman on Modern Monetary Economics: Setting the Record Straight on Paul Krugman's "Who Was Milton Friedman?"



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# The Impact of Milton Friedman on Modern Monetary Economics: Setting the Record Straight on Paul Krugman's "Who Was Milton Friedman?"

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**Abstract**

Paul Krugman's essay "Who Was Milton Friedman?" seriously mischaracterizes Friedman's economics and his legacy. In this paper we provide a rejoinder to Krugman on these issues. In the course of setting the record straight, we provide a self-contained guide to Milton Friedman's impact on modern monetary economics and on today's central banks. We also refute the conclusions that Krugman draws about monetary policy from the experiences of the United States in the 1930s and of Japan in the 1990s.

Key Words: monetarism, New Keynesian economics, inflation, price controls, Great Depression.
*JEL* Classification Numbers: E31; E51; E58.

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## Introduction

Paul Krugman's essay "Who Was Milton Friedman?" (Krugman, 2007a) seriously mischaracterizes Friedman's economics and his legacy as well as the legacy of monetarism.[1] Krugman also mischaracterizes monetary policy in the United States in the 1930s and in Japan in the 1990s. In this paper we provide a rejoinder to Krugman on these issues. In the course of setting the record straight, we provide a self-contained guide to Milton Friedman's main contributions to monetary policy debates and a picture of his impact on the policies of today's central banks.

We begin this rejoinder by summarizing Krugman's principal misstatements regarding Friedman's body of work and its influence on monetary policy formulation today. Krugman indulges in inaccurate forays into economic history by attributing the depth and duration of the U.S. Great Depression in the 1930s and Japan's extended slump in the 1990s to a liquidity trap, and giving an incorrect picture of the impact of monetarism on monetary policy (Section 1).

In Section 2, we trace the development of Friedman's ideas on inflation, beginning with the record of his opposition to the macroeconomic policies pursued in the United States during the 1960s and 1970s. We also briefly review Friedman's role in theoretical debates on inflation. We highlight differences between the views of Keynesians and those of Friedman. Friedman rejected both the cost-push and the simple Phillips curve approaches that were emblematic of Keynesian 1970s inflation analysis. We then describe the steps leading to Friedman's modifications of the simple Phillips curve and his criticism of Keynesian "patched-up" versions of the Phillips curve.

We next turn to the 1970s debates about price controls as the means of reducing inflation, and show that Krugman's (2007b) statements about the 1970s debate on controls in his reply to our criticisms exhibited further misunderstanding of the importance of monetarist debates and the contribution of monetarism.

We contrast Friedman's view on incomes policies to those of his leading Keynesian opponents (including James Tobin, Paul Samuelson, Arthur Okun, and Walter Heller).

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[1] Krugman's essay appeared in *The New York Review of Books* on February 15, 2007. Our Letter to the Editor in response to the essay, limited to 750 words by the magazine's rules, and a reply by Krugman, appeared in the March 29, 2007 issue (Schwartz and Nelson, 2007; Krugman, 2007b). Our response dealt only with some obvious inaccuracies in the essay although it alluded to questionable perspectives on technical economic issues in Krugman's commentary. Apart from the space limitations the periodical imposed, *The New York Review of Books* is not an appropriate forum for a discussion of these issues. This rejoinder serves that purpose.

We show that Krugman's assertion that opposition to price controls was common ground among monetarists and non-monetarists is incorrect.

Sections 3 to 5 then discuss Friedman's further influences on modern monetary policy thinking.

In Section 6, we refute Krugman's claims that a liquidity trap characterized monetary policy in the Great Depression in the United States in the 1930s and in Japan in the 1990s. For Krugman it is enough to note that short-term nominal interest rates are close to or at the zero bound to designate the two episodes as examples of a liquidity trap. He neglects an investigation of the actual motivations of the policymakers involved, and so the factors that account for the policies they adopted; he also understates the scope that was available for achieving a successful monetary expansion.

We conclude the paper in Section 7 with remarks on the credibility of Krugman's portrayal of Milton Friedman.

## 1. *Krugman's misstatements in "Who Was Milton Friedman?" about Friedman's economics and about monetarism, as well as his assertions of existence of liquidity traps*

### a. On Friedman

Krugman's (2007a) concluding paragraph states that "Milton Friedman was a very great man indeed—a man of intellectual courage..." This assessment contrasts with the string of negative judgments Krugman makes about Friedman, and particularly about Friedman's work on monetary policy, in the course of his essay. For example, Krugman claims that "[f]rom the beginning, the Friedman-Schwartz position [on the Great Depression] seemed a bit slippery"; that Friedman's post-1963 presentations of the Friedman-Schwartz account "began to seem—there's no other way to say this—intellectually dishonest"; and that "some of the things Friedman said about 'money' and monetary policy... appear to have been misleading, and perhaps deliberately so."

To some readers, Krugman's willingness to praise Friedman despite these accusations might indicate that his essay is balanced; but to us, it shows the degree to which the essay consists of doubletalk. Krugman's accusations constitute such fundamental criticisms that, if accurate, they should be sufficient to rule out a favorable conclusion about Friedman.

Specifically: How can he say Friedman was a great economist and a great man, if he believes Friedman to have been intellectually dishonest? Or argue that Friedman was a man of courage, if he misled people?

### b. On Monetarism

According to Krugman, the generally successful monetary policies observed in the United States and other countries since the 1980s amount to an unambiguous defeat for Friedman and monetarism. Krugman's discussion is confused to say the least—for example, in treating Friedman's work on inflation as separate from his work on monetary theory and policy. Krugman does certainly create the clear impression that monetary policy since the 1980s constitutes a return to the pre-Friedman, pre-monetarism *status quo*.[2] But the last 20 years have not seen a return in the United States and other countries to the wage-price guideposts and wage-price controls of the 1960s and 1970s; nor have they been characterized by anything other than wide acceptance of Friedman's position that controls and guideposts were ineffective ways to fight inflation. Replacement of these failed measures with arrangements in which central banks accept responsibility for inflation control, is a major legacy of Friedman and of monetarism—a legacy which Krugman (2007a), in attempting to press his case that "monetarism is now widely regarded as a failure," overlooks.

Does Krugman really believe that the principles monetarists advocated no longer influence the Federal Reserve and central banks in all advanced countries? Does he deny that Friedman's position that inflation is a monetary phenomenon has shaped monetary policy strategy around the world? Does he believe that the distinction between nominal and real interest rates, which had fallen into virtual disuse in U.S. and U.K. monetary policy discussions until the monetarist counterrevolution, is not a central part of contemporary policymaking? And what does he make of the public recognition of Friedman's contributions to monetary economics by such senior policymakers as Federal Reserve Chairman Ben Bernanke, former Chairman Alan Greenspan, Bank of England Governor Mervyn King, and former European Central Bank Chief Economist Otmar Issing?[3]

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[2] "… ever since then [1984] the Fed has engaged in precisely the sort of discretionary fine-tuning that Friedman decried" (Krugman, 2007a).

[3] For relevant statements, see Bernanke (2006), Greenspan (1997), Issing, Gaspar, Angeloni, and Tristani (2001, Ch. 1), and the quotation from Mervyn King in *The Guardian* (November 17, 2006).

A recent evaluation of the contribution of monetarism by Michael Woodford (2007, p. 3) notes accurately that "monetarism established that monetary policy can do something about inflation, and that the central bank can reasonably be *held accountable* for controlling inflation." This evaluation is inconsistent with Krugman's dismissal of monetarism.

In his reply to us, Krugman (2007b) objects that "to say that central banks now take responsibility for inflation is a long way from saying that monetarism has succeeded." But Krugman *himself* is on record as saying the following in a 1999 talk (Krugman, 1999):

> We live in the Age of the Central Banker…Through much of the world, quasi-independent central banks are now entrusted with the job of steering economies between the rocks of inflation and the whirlpool of deflation. Their judgment is often questioned, but their power is not… we have all become sort-of monetarists…

Therefore, in 1999 Krugman described the assignment of inflation control to central banks as evidence that "we have all become sort-of monetarists," but in 2007 he claims that this assignment cannot be said to be a legacy of Friedman and monetarism![4]

### c. Liquidity trap

Krugman disagrees with the accounts of the Depression given in Friedman and Schwartz (1963a) and Friedman's other writings. Krugman (2007a) disputes the Friedman-Schwartz position that preventing the money supply collapse would have avoided the Great Depression, and even argues that Japan's experience in the 1990s shows that central banks cannot increase the money supply much under Depression conditions. These claims indicate a degree of hardline Keynesianism on Krugman's part beyond that embraced by many of Friedman's contemporary Keynesian critics.[5] Does Krugman really believe that U.S. monetary policy was helpless in the 1930s? Does he believe that the Federal Reserve could not have conducted large-scale open market purchases? Does he deny that such operations would have prevented the collapse of the money supply and the economy? In his reply to us, Krugman (2007b) confirms that he indeed embraces the extreme Keynesian answers to these questions—he believes that the central bank was largely powerless to raise the money stock, and that, if achieved, monetary expansion would

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[4] Krugman's 1999 remarks are downloadable from the internet (see our bibliography). A published version has also appeared (Krugman, 2000).

[5] Krugman's (2007a, 2007b) position about the power of monetary policy is more negative than the position advanced in his early work on Japan (e.g., Krugman, 1998). In that early work he was already applying the label "liquidity trap" to Japan, but was nevertheless proposing monetary policy actions to revive the Japanese economy.

not have revived the economy. We argue the contrary case in Section 6, while also taking the opportunity to correct Krugman's misstatements about Friedman's work on the Great Depression. Prior to that discussion, however, we consider the contributions of Friedman and monetarism to monetary theory and policymaking (Sections 2 to 5).

## 2. *Milton Friedman's position on inflation*

In this section, we provide a perspective on Friedman's role in debates on inflation in the 1960s and 1970s. But as background for this discussion, we start with a brief review of his participation in *theoretical* debates. This review highlights the differences between his views and those of Keynesians. This allows us to bring out the corresponding differences between Friedman and Keynesians on policy issues in the 1970s. Our review of these debates establishes that Krugman (2007b) is incorrect to claim that opposition to price controls was common ground among monetarists and Keynesians. Our discussion of more recent developments emphasizes that the contemporary shift to inflation-oriented monetary policies reflects the influence of Friedman and monetarism.

### 2.1 Keynesian economics and inflation

> And if price-levels are determined by money-costs, it follows that whilst an 'appropriate' quantity of money is a *necessary* condition of stable prices, it is not a *sufficient* condition.
>
> John Maynard Keynes (1943, p. 185).

> …monetary restraint is a sufficient condition for controlling inflation…
>
> Milton Friedman (1980a).

Friedman regarded monetary policy as the decisive instrument for controlling inflation. This position distinguished Friedman from Keynes himself—as a direct comparison of the Keynes and Friedman quotations given above makes clear. Friedman further contended that monetary policy could not determine real variables such as output or employment in the long run. Friedman's stand on what monetary policy could do, and what it could not do, stood him apart from the predominant views associated with successive versions of Keynesian economics. The successive Keynesian positions were: (i) that inflation was a cost-push phenomenon

independent of demand pressure (at least until output reached its full-employment level); and (ii) the early Phillips-curve position, according to which inflation did depend on demand pressure, but a menu of trade-off choices existed, whereby higher inflation could permanently buy lower unemployment. We consider Friedman's characterization and critique of each of these positions, before considering his own view of the inflation process.

*Friedman's characterization of the Keynesian view of inflation.* Friedman (1953a, p. 118) characterized the Keynesian view of price-level behavior as follows: prices were insensitive to increases or decreases in nominal aggregate demand so long as output remained below its full-employment level; once output attained its full-employment position, on the other hand, prices absorbed any further increase in nominal aggregate demand. He later described the rigid-price-level assumption as "the distinctive feature" of Keynesian economics (Friedman, 1972a, p. 906), prominent both in the work of "Keynes himself, and his American followers even more" (Friedman and Schwartz, 1982, p. 426).[6]

According to Friedman's characterization, while Keynesian analysis did acknowledge that price fluctuations occurred while output was below its full-employment value, it did not treat these fluctuations endogenously.[7] Rather, as Friedman put it, prices and the inflation rate were treated as an "institutional datum."[8] In particular, variations in inflation were attributed to exogenous cost-push forces. Friedman emphasized that the view of inflation as cost-push was a form of Keynesian analysis which particularly received support from Keynes' *General Theory* (1936). A markup equation for prices, "link[ing] prices to costs, mainly wages," with costs autonomously determined, was "derivable from Keynes' system,"[9] and the treatment of inflation as cost-push was "more general [than the price-rigidity assumption] and perhaps more consistent with the spirit rather than the letter of Keynes' analysis."[10]

This characterization of Keynes (1936) was challenged in Friedman's 1972 debate with his critics, with Friedman (1972a, p. 906) noting that three of his five critics disputed his

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[6] More specifically, Friedman interpreted Keynes as assuming wage rigidity. But Friedman treated this as implying *de facto* price rigidity (see, for example, Friedman, 1977, p. 468). The perception of wage rigidity as implying price rigidity was consistent with standard representations of Keynesian economics, such as most traditional IS-LM analysis. It also reflected Friedman's preference for a "concentration on a few key magnitudes" (Friedman, 1972a, p. 908) and therefore often abstracting from "the margin between prices and wages" (Friedman and Schwartz, 1982, p. 446). See also Friedman (1976a, p. 218) for a related discussion.

[7] See Friedman and Schwartz (1982, 49–50).

[8] See, for example, Friedman (1972a, p. 910; 1976a, p. 219); Friedman and Schwartz (1982, p. 42).

[9] Friedman (1972a, Appendix 2, point 11); Friedman and Schwartz (1982, p. 49).

[10] Friedman and Schwartz (1982, p. 61).

interpretation. But Friedman's position is consistent with the views of Roy Harrod, Keynes' biographer.[11] Harrod wrote in 1958:

> I would venture to point out that the contrast between demand inflation and cost inflation is quite fundamental to what is known as Keynesian economics. Those who regard cost inflation and demand inflation as similar phenomena should be regarded as pre-Keynesian. (Harrod, 1958, p. 115, para. 68.)

Harrod went on to say that Keynes' practice in the *General Theory* of expressing variables in "wage units" was a means of abstracting from cost-push inflation when studying variations in aggregate demand. Harrod's statement is consistent with Friedman's portrayal of Keynesian economics as a doctrine that espoused a cost-push view of inflation. In addition, Harrod's statement supports Friedman's position that the rigid-prices assumption was a natural simplification in Keynes' analysis because price movements served no economic function in that analysis when output was below full employment; instead of acting to clear demand/supply imbalances, price movements simply reflected autonomous cost variations, so it was logical to treat prices as rigid when considering demand-management issues.[12]

*Simple Phillips curve approach*. Friedman acknowledged that later developments of Keynesian economics made the price level endogenous by replacing the assumption of rigid or exogenous prices when the output gap was negative, with the simple Phillips curve approach. In the early Phillips-curve literature, inflation depended on the output gap (or on unemployment relative to its full-employment level). Therefore, in contrast to early Keynesian analysis, the price level was now treated as endogenous for all levels of output. Friedman (1977, p. 469) noted that the Phillips curve approach seemingly "filled a gap in Keynes' theoretical structure" by adding inflation to the list of endogenous variables.[13]

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[11] See Harrod (1951). Readers of Keynes (1943) will also find unmistakable support for Friedman's characterization of Keynes' views.

[12] See Friedman (1972a, Appendix 2, point 9), and Friedman and Schwartz (1982, p. 49).

[13] In addition, unlike early Keynesian work in which full employment corresponded to maximum feasible employment, Phillips curve analysis was more flexible by allowing for the possibility of positive output gaps (i.e., overfull employment), as Friedman (1976a, p. 218) noted.

## 2.2 Friedman's view of inflation

Friedman rejected both versions of Keynesian inflation analysis: the cost-push view and the simple Phillips-curve view.

Friedman rejected the cost-push view in favor of the position that inflation depends on monetary policy via an aggregate demand channel. "The price level and inflation are monetary phenomena," he wrote, "not institutionally determined data to be analyzed by psychologists and industrial relations and industrial organization specialists."[14] The factors typically cited as sources of cost-push inflation could not, in fact, have a sustained effect on inflation unless they were accommodated by monetary policy.

Friedman's objection to simple Phillips curve analysis, on the other hand, was that it preserved a form of money illusion. The underlying inflation/unemployment or inflation/output gap relationship embedded in simple Phillips curves was typically motivated by appeal to the determination of wages and employment in the labor market. Friedman (1968) argued that the flaw in this approach was that it made bargaining over real quantities (i.e., the equilibrium level of employment or hours worked) a function of a nominal variable, namely nominal wage growth $\Delta w_t$.[15] Traditional Phillips curve analysis imposed a form of money illusion by not including in the equation for $\Delta w_t$ an inflation term, with unit coefficient, that was needed to make the equation effectively a description of real wage adjustment.

At the same time, a satisfactory Phillips-curve specification could not be obtained simply by adding current inflation ($\Delta p_t$) to a $\Delta w_t$ equation. The reason is that such a modification would make the equation one for real wage growth ($\Delta w_t - \Delta p_t$), with nothing to say about the determination of $\Delta w_t$ and $\Delta p_t$ separately; that is, it could not serve as an equation pinning down inflation behavior.[16] Friedman (1968, 1977) instead proposed a different modification, which still admitted a long-run interpretation of the equation as a real wage equation. This proposal was to view the Phillips curve as describing the evolution of *perceived* real wage growth: for example, $\Delta w_t - E_{t-1}\Delta p_t$. Underlying this modified Phillips curve was the idea that contracts for nominal wages were negotiated conditional on last period's expectation of this period's price

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[14] Friedman (1975, p. 176).
[15] Here $w_t$ is the log of the nominal wage index in period $t$, and $\Delta$ is the first difference operator.
[16] See Friedman and Schwartz (1982, p. 50).

level.[17] The resulting Phillips curve was of the form $\Delta w_t = E_{t-1}\Delta p_t + \xi_u (u_t - u_t^*)$; if $\Delta p_t$ is then substituted for $\Delta w_t$ via a constant-markup assumption, there emerges the expectation-augmented Phillips curve, $\Delta p_t = E_{t-1}\Delta p_t + \xi_u (u_t - u_t^*)$.[18] The expectations-augmented Phillips curve simultaneously allows for a short-run inflation/unemployment relation for a given natural rate of unemployment (more precisely, a $\{\Delta p_t, u_t - u_t^*\}$ relation); as well as the long-run absence of such a relationship, with $u_t$ invariably reverting to the natural unemployment rate $u_t^*$ irrespective of the maintained inflation rate. Phelps (1967, 1968) provided modifications to the Phillips curve that paralleled and overlapped with Friedman's proposals.

Though an explicit augmented-expectations Phillips curve was not written down in Friedman (1968) (appearing, however, in Friedman, 1970a, and Friedman and Schwartz, 1982), the discussion in Friedman (1968) provided a basic underpinning for subsequent developments of the expectations-augmented Phillips curve and the natural rate hypothesis, including rational expectations models with nominal price or wage stickiness such as those in Fischer (1977) and Taylor (1980). That influence continues to be reflected in the modern literature that incorporates nominal price contracts into a dynamic general equilibrium environment. An early study in this literature, King and Wolman (1996), noted the common themes with those advanced by Friedman, and the authors listed five elements which meant that their "model is monetarist." These included the presence of temporary price stickiness, which implied "short-run non-neutrality of money with long-run neutrality," an implication they noted was "in line with the perspective of Friedman and Schwartz (1963a, 1963b)." The authors further observed that their model implied an "emphasis on expectations... in the tradition of Irving Fisher and Milton Friedman" (King and Wolman, 1996, pp. 83–84).

Friedman (1977, p. 469) further criticized Keynesian economics for using "patched-up versions" of the Phillips curve that added explanatory variables, but did not make the vital modification of including expected inflation with a unit coefficient. Starting with Phillips (1958) and Samuelson and Solow (1960), subscribers to a simple Phillips curve had tried to explain deviations from the curve by appeal to cost-shifting variables such as import prices or labor

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[17] Friedman's (1968, p. 10) terminology for the price level relevant to the wage decision was the "earlier price level," but a more precise terminology, and one consistent with our use of $E_{t-1}\Delta p_t$ in the text, would be "the previous period's expectation of the current price level." Such an interpretation is consistent with Friedman's (1977, p. 457) statement that the "perceived future average price" enters nominal wage agreements.

[18] As in traditional Phillips curve analysis, $\xi_u < 0$, to ensure that inflation responds to excess demand and supply.

union pressure. In Friedman's view, as an empirical matter, a simple Phillips curve augmented by these additional explanatory variables was not an adequate substitute for the expectations-augmented Phillips curve; and as a theoretical matter, adding these extra variables brought in cost-push factors as supplementary explanations of inflation, and so actually went back in the direction of treating prices as an institutional datum.[19]

### 2.3 Policy debates on wage and price controls in the 1970s

Friedman's analysis of inflation in the 1970s reflected his theoretical views. He diagnosed the inflation problem in the United States and elsewhere as "excess demand" due to monetary ease.[20] He completely rejected wage and price controls as a solution, for several interrelated reasons. One of these was traditional: controls did not genuinely remove inflationary pressure but simply meant that price signals were suppressed, creating shortages, or had to be transmitted in a less efficient way, such as via quality changes. This line of argument paralleled the criticism of wartime price controls in Friedman and Schwartz (1963a, p. 557).

Friedman's remaining arguments against controls reflected the circumstances of the 1970s policy debate and his reaction to it. Cost-push theories were being revived as an explanation of U.S. inflation, and incomes policies (i.e., some variant of wage and price controls) proposed as the ideal way of fighting this inflation. Friedman continued to reject cost-push as a credible source of sustained inflationary pressure: he knew of no postwar episode explicable by cost-push (Friedman, 1966), while the 1970s inflation was attributable to past monetary expansion, not wage-push (Friedman, 1972b). Therefore, he saw no justification for incomes policy. Controls and other actions on specific prices would transfer inflationary pressure to those items in the price index not subject to control. With inflation due to excess demand, controls were counterproductive: not only did they take attention away from the genuine cure, which was reduced pressure on demand; by virtue of their perceived status as a distinct tool against inflation, incomes policies actually gave policymakers more reason to pursue expansion of aggregate demand.

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[19] See Friedman (1976a, p. 219) and the discussion of the inflation equations in Solow (1969) in Friedman (1976a, p. 228) and Friedman and Schwartz (1982, p. 446).

[20] See, for example, Friedman's *Newsweek* columns "Burns and Guidelines" (June 15, 1970) and "Imitating Failure" (January 11, 1971), reprinted in Friedman (1972c, Chapter 2).

Accordingly, when President Nixon's "New Economic Policy" of August 1971 included a wage-price freeze (to be followed by further phases of controls), Friedman's *Newsweek* column was entitled "Why the Freeze Is a Mistake." Friedman warned in 1971 that proponents of incomes policy regarded it "as a *substitute* for demand restraint, not a supplement," and would lead to the attitude: "Full speed ahead. The price freeze will hold back inflation."[21]

Friedman's opposition to incomes policy, his rejection of cost-push accounts of inflation behavior, and his calls for monetary restraint, are in contrast with the positions of leading Keynesians during the 1970s, as we will now show.

***James Tobin***. Tobin noted that a major difference on inflation policy between himself and Friedman was in their attitudes to incomes policies:

> [Friedman] will not entertain wage and price controls or other incomes policies as alternatives or complements to anti-inflationary monetary restrictions… If they [i.e., monetarists] triumph, democratic capitalist economies will suffer high unemployment and slow real growth for some years to come. (Tobin, 1976.)

Tobin was therefore an advocate of incomes policies to fight inflation. He saw cost-push as a distinct source of inflation, and one requiring direct measures: "if the real wages and profits demanded for producing output add up to more than the output produced, we will have to inject more competition, or alternatively control *a la* guideposts, into the setting of prices and wages." (Tobin, 1966, p. 12.)

In principle, Tobin supported monetary and fiscal policies that complemented the incomes policies that he wanted deployed against inflation. But this did not lead him in practice to support monetary restraint during the 1970s. Rather, Tobin endorsed the expansionary economic policies pursued in the United States. For example, in lectures given in 1972, Tobin wrote approvingly of the shift to expansionary policies that the Nixon Administration had undertaken in 1971:

> At the beginning of the Nixon Administration there were indications that the new Council and other top economists were taking a monetarist line… But events, common sense, and politics have prevailed… The New Economics lives after all. (Tobin, 1974, p. 70.)

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[21] See Friedman's *Newsweek* columns "Imitating Failure" (January 11, 1971) and "Why the Freeze Is a Mistake" (August 30, 1971), reprinted in Friedman (1972c, Chapters 1 and 2).

Similarly, in testimony to Congress in September 1971, Tobin said, "The more stimulus that occurs during the wage-price freeze the better… Now the Fed should engineer a reduction in interest rates to aid the expansion…" (September 9, 1971, testimony, in Joint Economic Committee, 1971a, p. 375). He added that "the freeze must be followed by guideposts." (Ibid, p. 377).

In fact, Tobin advocated monetary and demand management policies for the United States over the 1970s that were even more expansionary than those actually followed. In February 1977 he recommended that the Fed "lower significantly short-term rates… say, by 150 basis points." (February 4, 1977, testimony, in Banking, Finance, and Urban Affairs Committee, 1977a, p. 138.) Thus, in addition to supporting incomes policies, Tobin supported the demand policies that produced the mid-1970s peak in inflation, and wanted a monetary policy even looser than that which produced the second peak of inflation in 1980.

For Tobin, the contribution that aggregate demand management could make was in securing full employment. From that perspective, demand restriction was justified when output threatened to exceed its full-employment level. But constriction on aggregate demand in any other circumstances was damaging to the full-employment objective, and, in Tobin's view, did not contribute to controlling inflation. After the mid-1960s, Tobin rarely perceived the economy as being in an excess demand situation, and so often criticized U.S. monetary policy for being too tight.

***Paul Samuelson.*** Much of Paul Samuelson's commentary on macroeconomic policy during the 1970s took place in his *Newsweek* columns. In these columns, Samuelson repeatedly stressed cost-push as a source of inflation. In a late 1970 column, Samuelson acknowledged that "classical demand-pull inflation" had been a problem over the second half of the 1960s, but he argued that the situation had changed, and that inflation now reflected "the militant desire of union members" for wage increases. This, he said, vindicated the "increasing emphasis on this new disease of 'cost-push' or 'sellers' inflation'" that he had put in his writings. Samuelson continued, "What can be done about cost-push inflation…? What is needed is some kind of a successful 'incomes policy'…" Samuelson argued that incomes policy would leave demand management free to produce full employment without wage pressure. (*Newsweek*, December 28, 1970: see Samuelson, 1970.)

In his October 4, 1971, column, Samuelson said that President Nixon's New Economic Policy was necessary, and that the year-to-end-1972 inflation rate would be 1% less than otherwise as a consequence of the introduction of wage/price controls (Samuelson, 1971). In 1973, Samuelson argued that the next price-control phase "must bear down selectively hard on the few hundred largest industrial corporations which do have quasi-oligopolistic administered prices." (*Newsweek*, July 23, 1973: see Samuelson, 1973.) In the late 1970s, Samuelson continued to support incomes policy, writing, "I'd counsel experimenting with tax rewards to price and wage moderation…" (*Newsweek*, January 2, 1978: see Samuelson, 1978.)

***Arthur Okun*.** When the 1971 wage-price freeze was imposed, Okun (Chairman of the Council of Economic Advisers 1968–69) said that it reflected a "newfound realism" on President Nixon's part (*New York Post*, August 16, 1971: see Greenspan, 1971). Okun continued to support incomes policies in subsequent years, focusing on incentive- and guidepost-based wage policies instead of wage and price controls. He repeatedly advocated a cost-push view of inflation. For example, in April 1977, Okun testified: "[T]he structure of the American economy clearly has been transformed… With cost-oriented prices and equity-oriented wages, excess supply cannot break the momentum of inflation and restore price stability." (April 6, 1977, testimony, in Banking, Finance, and Urban Affairs Committee, 1977b, p. 13.)

Okun was a persistent critic of the use of monetary policy against inflation. "Any professional economist who respects the facts must conclude, regretfully, that our momentum-inflation cannot be brought under control by any reasonable fiscal-monetary strategy." (Ibid, p. 14.) Okun also referred to "fiscal-monetary restraint, which has been thoroughly tested and proved a failure." (Ibid, p. 15.) The solution was incomes policy: "[F]iscal-monetary policy alone won't do the job… And I think that countries that have adopted structural measures and incomes policies have found them worth having." (Ibid, p. 36.) A wage-guideline system was "effective in the early 1960s and I am hopeful that it will be once again." (February 7, 1979, testimony, in Banking, Housing and Urban Affairs Committee, 1979, p. 150.)

In contrast to Friedman, Okun repeatedly rejected the excess-demand diagnosis of recent years' inflation, stating in 1978: "The inflation we have had in the last three years simply is not an excess demand phenomenon..." (April 24, 1978, testimony, in Ways and Means Committee, 1978, p. 6341.) Okun therefore argued that "fighting inflation by curbing demand at a time when

it is not being caused by excess demand is absurdly inefficient." (May 22, 1978, written testimony, in Banking, Housing, and Urban Affairs Committee, 1978, p. 17.) In 1979, Okun testified: "any additional fiscal-monetary restraint would be an overdose, seeking to cure excess-demand inflation when that is not the disease." (February 5, 1979, testimony in Ways and Means Committee, 1979, p. 330.) And he claimed: "During recent years, the price-wage spiral has been the most fundamental source of rapid inflation in the United States. Any efficient cure for inflation must get directly at that source. At the present time, the administration's program of price-wage standards [i.e., guideposts] deserves our full support." (Okun, 1979, p. 50.)

***Walter Heller.*** Walter Heller (CEA Chairman 1961–64) wrote in early 1976, "American business seems to be losing many of its inhibitions about jacking up prices… The old formula, namely, focus on the concentrated industries and the powerful labor unions, and monitor their price and wage increases, makes awfully good sense…" (Heller, 1976, p. 59.) Along similar lines, Heller testified that "Congress should bear constantly in mind that any balanced program for full employment without excessive inflation must contain some kind of restraint on excessive price increases exacted by concentrated industries and excessive wage increases exacted by overly powerful labor unions." (March 10, 1976, testimony, in Budget Committee, U.S. Senate, 1976, p. 247.) In 1977, Heller said: "What the country faces is not demand-pull inflation, but the stubborn push of a price-wage or cost-price spiral that has to be tackled from the cost, supply, and incomes policy side." (January 11, 1977, testimony, in Budget Committee, U.S. Senate, 1977, p. 31.) Monetary policy actions against inflation, he said, would be ineffective: "our fundamental source of inflation is that price-wage spiral… [and] any attack on inflation [that] doesn't include a direct attack on that… isn't going to work." (March 5, 1979, testimony, in Budget Committee, U.S. Senate, 1979, p. 46.) Heller (1979) claimed that "three years of slack in the economy from early 1975 to early 1978… failed to dent the underlying rate of inflation." He wrote approvingly of "a vigorous policy of wage-price restraint to curb cost-push inflation… that is so resistant to economic slack and recession."

***Gardner Ackley***. Gardner Ackley (CEA Chairman 1964–68) authored a leading graduate textbook in macroeconomics.[22] This textbook (Ackley, 1961) contained a long discussion stressing the empirical relevance of cost-push inflation. Ackley (1961, p. 443) challenged the "repeated assertions by some theorists that cost inflation is meaningless," and criticized past U.S. economic policymakers for "seem[ing] to assume that any inflation is necessarily of the demand variety." In 1971, Ackley testified, "My judgment depends in part on the proposition that we are not in a situation of excess demand. Individual prices have been rising mostly because other prices have been rising." (August 31, 1971, testimony, in Joint Economic Committee, 1971b, p. 257.) He described President Nixon's freeze as "a vital first step… In the area of inflation control, the immediate next step must be to replace the freeze with an effective incomes policy." (Ibid, pp. 248, 256.)

### 2.4 Friedman and modern monetary policy

The preceding discussion has established that: (i) Friedman identified Keynesian economics with cost-push views; (ii) this interpretation finds support from a leading Keynesian who was one of Keynes' biographers; (iii) Friedman's concentration on monetary causes of inflation and Keynesians' emphasis on cost-push causes are manifested in their respective positions on the 1970s inflation, with Friedman opposing incomes policies and criticizing monetary expansion, at the same time that leading Keynesians emphasized nonmonetary approaches to inflation control and analysis.

It is clear that Friedman's perspective has had a more durable influence on anti-inflation policy than the cost- and incomes-policy-oriented perspective taken by his 1970s critics. Indeed, the adoption of inflation targeting and similar procedures by central banks in recent decades can be thought of as reflecting an acceptance of Friedman's position that monetary restraint is both necessary and sufficient for inflation control. While much of the discussion of monetarism in the 1970s policy debates was formulated in terms of monetary aggregates, it was clear even in the 1970s that a distinguishing feature of monetarism was the responsibility it assigned to monetary policy for the control of inflation. For example, the member of the Federal Open Market Committee who was most sympathetic to monetarist views during the 1970s noted that "the

[22] According to McCallum (1986, p. 10), Ackley (1961) was "the standard, graduate macro text of the 1960s."

implication is that monetary policy should be formulated with an eye toward controlling inflation" (Francis, 1974, p. 7). This contribution of monetarism is borne out by the Woodford (2007) and Krugman (1999) quotations given in Section 1, and by the analysis of Mishkin (2007).

## 3. *Additional contributions by Friedman to monetary economics*

The influence of Friedman on monetary policy analysis is not limited to his extremely influential positions on the causes of inflation and on the need for inflation-oriented monetary policy rules. Other aspects of Friedman's work have been very influential on modern thinking about monetary policy. Some examples follow.

(*a*) *The Fisher effect and the nominal/real interest rate distinction*. Both McCallum (2004) and Woodford (2007) acknowledge that the real/nominal interest rate distinction was a major theme stressed by monetarists. As Friedman (1983, p. 2) observed, "inflationary expectations play such an important role in monetarist analysis." Friedman continually stressed inflationary expectations as a factor in the determination and interpretation of nominal interest rates. Friedman (1958, p. 183) had noted that once inflation becomes anticipated, "interest rates will rise to allow for the price rise." The danger of failing to distinguish between real and nominal interest rates, and so treating low nominal rates as synonymous with easy money and high nominal rates as tight money, was a theme Friedman consistently emphasized, notably in Friedman (1968). As Friedman (1975, p. 176) put it: "Nominal interest rates must be sharply distinguished from real interest rates."

This stress on the Fisher effect distinguished monetarism from Keynesian analysis well into the 1970s. Suppressing the nominal/real rate distinction when specifying the IS curve relationship was a flaw Friedman (1971, p. 330) emphasized in traditional IS-LM analysis: "anticipations of inflation… seem to me too important and too central to be pushed off stage…" But even years after 1971, traditional IS-LM analysis that abstracted from expected inflation, and so had the nominal interest rate instead of the real interest rate appearing in the IS equation, was still appearing in journals. For example, Benjamin Friedman (1978a) undertook policy analysis with just such an IS-LM setup. And when he did study the relation between nominal rates and

inflation in his empirical work, Benjamin Friedman reached conclusions different from monetarist analysis. He acknowledged that nominal rates in the 1970s had not kept up with inflation, but he interpreted this phenomenon as a financial market reaction rather than a reflection of easy monetary policy (B. Friedman, 1978b).

By contrast, Milton Friedman emphasized that the fact that nominal rates were below inflation was a sign that the Federal Reserve was creating excessive monetary ease. The result was that nominal interest rates were much higher than they were in the 1960s because the liquidity effect of earlier rounds of ease had worn off, and the Fisher effect had emerged in the wake of the earlier easy periods, causing nominal rates to rise. But real interest rates were low because the Federal Reserve was still following a generally expansionary policy, with each added stimulus tending to push unemployment and the real interest rate temporarily below their natural values.

The convergence of economists to agreement with the monetarist emphasis on the Fisher effect played a part in the move to a new monetary policy regime. Taylor (1998, p. 8) observes that "emphasizing the distinction between the real and nominal interest rate [was] part of the means" by which the Federal Reserve moved to a more inflation-control-oriented policy from the end of the 1970s. This observation is confirmed by the newly released transcripts of the Federal Open Market Committee meetings for 1978. At the July 18, 1978, FOMC meeting, the President of the Federal Reserve Bank of Minneapolis, Mark H. Willes, observed,

> Most of the economic theory that I know says that if you want to look at the real bite of interest rates, you also adjust for inflation. And interest rates adjusted for inflation are not high at all. I think that is the sense [in which] we are not very tight. In fact, we have had negative real rates of interest on Treasury bills, for example, for over two years. This is in contrast with periods in the early '60s and most of the '50s when real rates of interest not only were not negative, but they were positive. I don't see how we can deal effectively, when we are at full employment, with accelerating inflation, and still have substantially negative real rates of interest. So it does not bother me to have interest rates go up; I think they should go up. If they don't go up, I think we are simply guaranteeing more rapid rates of inflation, which will then guarantee, in turn, higher interest rates. One of the most stable and profound relationships we have in all of economics is the relationship between inflation and interest rates, and I don't think we hold [inflation] down by failing to move interest rates up now. (In Transcript, Federal Open Market Committee Meeting, July 18, 1978, pp. 40–41.)

Several years later, Friedman (1986, p. 644) was able to observe, "no one any longer disregards Fisher's distinction between nominal and real interest rates."

(*b*) *Costs of inflation via relative price distortions*. Friedman (1958, p. 183) noted that inflation made it "more difficult to maintain the appropriate structure of relative prices, since individual prices have to change in order to stay the same relative to others." In Friedman (1974, p. 30) he elaborated on this theme, noting the coexistence of some predetermined prices and some prices that were able to react when nominal aggregate demand changed. In such an environment, "a slowdown of total spending produces substantial shifts in relative prices, which will sooner or later have to be corrected; the correction in turn will cause economic disturbances."

As Taylor (1981, pp. 57–58) observed, the "added risk and uncertainty about… relative price changes" was an element stressed in Friedman's (1977) Nobel lecture and cited there as a reason why inflationary policies might produce a lower natural level of output and a higher natural rate of unemployment. Thus Friedman's writings emphasized both resource misallocation and economic fluctuations as likely to result from the distortions to the relative price structure produced by inflation. Friedman's (1974) proposed remedy was indexation if inflation continued; or better still, no inflation and no indexation.

The New Keynesian literature has built on these themes of Friedman's. For example, Taylor (1981, p. 72) considered "relative price dispersion due to a mixture of [nominal] contracts of different lengths." New Keynesian analysis centers on the welfare costs associated with relative price dispersion (see King and Wolman, 1996; Rotemberg and Woodford, 1997; Woodford, 2003). These costs are implied by the interaction of fluctuating inflation and staggered nominal price contracts.

The explosion of work on relative price dispersion therefore illustrates another instance of a Friedman theme that has been formalized and has become central to macroeconomics. The vindication of Friedman's position by the New Keynesian literature contrasts with the reaction by older Keynesians to Friedman's relative-price idea. For example, a U.K. Keynesian, R.C.O. Matthews, claimed in 1982 that none of the participants at a macroeconomic conference believed that appreciable costs of inflation came via the relative-price-distortion channel, and that he could not find anyone willing to provide a paper for the conference that argued that this was an empirically important channel (Matthews, 1982, p. 11).

(*c*) *Lags in effect of monetary policy*. Friedman's influence here is brought out by the language used in prominent discussions of the issue during the 1990s. *The Economist* (1991) noted: "Interest rates work with long and variable lags." Mervyn King (1992, p. 308) observed, "we have had cause to resort to 'long and variable time lags' in our description of [monetary policy] transmission." And Alan Blinder (1998, p. 13) remarked, "It is a commonplace that monetary policy operates on the economy with 'long and variable lags.'"

As these quotations indicate, Friedman's (1961, p. 464) phrase "long and variable lags" to characterize the response of the economy to monetary policy actions, has become such a part of the vernacular that it is rarely attributed to him. But it is worth remembering that Friedman's emphasis on lags was challenged by Keynesian critics in the 1960s. For example, Ando, Brown, Solow, and Kareken (1963, p. 3) contended, "Milton Friedman's proposition that the effects of monetary policy actions on aggregate output are powerful, but occur with a very long and highly variable lag… simply will not hold water." They rejected Friedman's emphasis on the response of aggregate output, preferring to study components of expenditure. Their study concluded that monetary policy mainly works via inventory investment, which responds within a quarter to interest-rate movements (Ando *et al*, 1963, pp. 5–6).[23] This position contrasts with the emphasis by economists today, in line with monetarists' position in the 1960s and 1970s, on important but delayed responses of private consumption and all investment categories to monetary policy actions.

(*d*) *Dangers of relying on measures of potential output and the output gap*. As Orphanides (2003) stresses, Friedman continually warned of the fragility of estimates of potential output and the output gap, and cautioned against giving them heavy weight in making monetary policy. In light of the large errors in estimates of potential during the 1970s, that warning appears prudent. As early as 1979, an undergraduate textbook specifically identified with monetarists the view that U.S. output gap estimates were unreliable (Wonnacott and Wonnacott, 1979, pp. 333–334).

(*e*) *Benefits of flexible exchange rates*. One of Krugman's first papers, Dornbusch and Krugman (1976), was on the subject of floating exchange rates. The opening page of Dornbusch and

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[23] Their narrow conception of the interest-elastic component of aggregate demand supports the characterization of Keynesian economics in Friedman (1972a) and Bordo and Schwartz (2004).

Krugman's article observed, "The literature on flexible rates goes back to Milton Friedman, 'The Case for Flexible Exchange Rates,' in his *Essays in Positive Economics*." But this Friedman article (Friedman, 1953b), and its enormous influence on economists and policymaking, are not mentioned in Krugman's (2007a) article on Friedman. In rationalizing this omission, Krugman (2007c) said, "I didn't bring up exchange rate policy because I don't think Friedman can be said to have made a deep intellectual contribution on the subject." The fact is that Krugman has acknowledged on the record that Friedman *launched* the literature on flexible rates—which is by itself a deep intellectual contribution.[24]

(*f*) *Rejection of credit controls*. Some Keynesians believed that formal and informal credit controls could serve a valuable monetary policy role, reducing the need for interest rates to rise when the authorities wanted to restrict aggregate demand. Arthur Okun, for example, suggested that a "firm squeeze on the availability of credit can be applied… with a dozen telephone calls to commercial bankers." He argued that this "jawboning approach" could create a "pinch on availability without… interest rates anywhere near their present level." (March 10, 1980, testimony, in Banking, Housing, and Urban Affairs Committee, 1980, pp. 53, 80.) Paul Samuelson (1980) argued that with "direct limitations on borrowing, any desired slowdown in overall activity could have been contrived with interest rates not having to peak so high."

Friedman (1960) rejected the use of credit controls, arguing that open market operations were an unambiguously superior policy tool. Friedman and Schwartz (1970, p. 145) suggested that direct controls on banks were ineffective, as they promoted growth in financial intermediaries not subject to the regulations. Open market operations did not have this difficulty as they delivered symmetric signals to all financial intermediaries.

The dismantling of credit controls and the focus on open market operations in modern central banking reflect acceptance of Friedman's position on credit controls.

(*g*) *Permanent income and the allocation of consumption across periods*. Friedman's (1957) work on the consumption function is often interpreted as a contribution to macroeconomics but not to monetary economics. Krugman follows this interpretation, treating the permanent income hypothesis separately from Friedman's work on monetary policy. This treatment does make

[24] Furthermore, Krugman (1993, p. 519) referred to Friedman (1953b) as "a seminal paper."

sense from the perspective of the traditional literature on consumption. That literature often treated the competition between the permanent-income and traditional Keynesian hypotheses as bearing on the choice of income concept for studying consumption in partial equilibrium. Accordingly, the hypotheses were often presented as attempts to rationalize scatter plots of consumption data against income data.

From the perspective of modeling today, however, placing the permanent income theory outside monetary economics is less justifiable. When interest rates are not treated as constant, the permanent income theory is valuable not just in accounting for consumption/income patterns, but in describing the transmission of monetary policy. Friedman's (1957, p. 221) notion that "consumption is determined by longer-range income considerations" provides a useful way of understanding how consumption and aggregate demand respond to monetary policy. The permanent income theory can be regarded as a description of the consumer's inclination to smooth consumption across periods, a property of modern models highlighted by Hall (1978) and Lucas (1988), and inherited by New Keynesian macroeconomics. At the same time, real interest-rate changes—abstracted from in Hall (1978) but not in the New Keynesian literature—are among the factors that will induce consumers to deviate from a smooth pattern; for example, they will delay consumption from today to tomorrow in response to a temporary increase in short-term real interest rates.[25] Friedman's key insights about intertemporal substitution—the allocation of consumption over time given an intertemporal budget constraint—are therefore an essential element in thinking about the reaction of consumption to interest-rate changes.[26] The characterization of consumers' problems as dynamic makes it natural to view the consumption choice as an intertemporal decision analogous to the decisions governing other private expenditure categories, with the result that "monetary disturbances will produce systematic patterns in the reaction of such components of output as construction, other investment, consumption, and so on."[27]

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[25] Friedman (1957, p. 221) himself noted that in addition to being a function of permanent income, consumption "depends on other variables, such as the interest rate."
[26] This point was stressed by King and Wolman (1996).
[27] Friedman and Schwartz (1982, p. 620).

## 4. *The influence of monetarism on Krugman*

Krugman is not a specialist in monetary economics. His lack of appreciation of the contributions of monetarism may partly reflect the fact that many monetarist ideas were already being incorporated by moderate Keynesians into their analysis by the time Krugman became active in economics. This possibility is brought out by studying a 1970s textbook that Krugman regards highly, Dornbusch and Fischer (1978). Krugman has recently stated (Krugman, 2007d):

> The key thing is that good Keynesianism, as embodied even in undergrad textbooks of the time, was *perfectly OK*: Dornbusch and Fischer, 1978 edition, offered a description of what disinflation would look like that matches the experience of the '80s reasonably well, and the textbook does not seem all that dated even now.

We have no disagreement with Krugman on the merits of the Dornbusch-Fischer textbook. But it is misleading simply to label its analysis as "good Keynesianism." A major reason why Dornbusch and Fischer (1978) "does not seem all that dated even now" is because it incorporates many monetarist ideas. Indeed, Dornbusch and Fisher (1978, p. 520) observe,

> Much of the analysis of this book would, a few years ago, have been considered monetarist.

Dornbusch and Fischer (1978, p. 521) go on to acknowledge Friedman's influence on monetary economics far more accurately and fairly than Krugman did:

> The forceful and persuasive way in which Friedman has emphasized the role of money has changed the views of most economists on the importance of monetary policy.

## *5. Explaining Krugman's view of modern monetary policy*

How could Krugman have arrived at so egregious a misunderstanding of the spirit and content of modern monetary policy? And of their connections to Friedman's monetary economics? A possible explanation is that Krugman is unfamiliar with the literature of the past two decades incorporating monetarist perceptions into Keynesian and New Keynesian economics, but that he acquired superficial information about two positions of Friedman's that central banks did not embrace. In particular: (1) Friedman urged the Federal Reserve to adopt a constant growth rate for a monetary aggregate as a *faute de mieux* policy that would reduce the volatility of money growth; (2) Friedman recommended that the Fed use as its instrument the

monetary base instead of the nominal Federal funds rate. If Krugman regarded these two positions as the essence of monetarism, he could jump to the conclusion that monetarism was dead.

It is worth reviewing the reasons that led Friedman to adopt these positions.[28] Historically, major mistakes in monetary policy occurred in periods when central banks associated low nominal rates with easy policy, ignoring the signal—coming from a stagnant or declining money stock—that monetary policy was tight; or when they interpreted a high nominal rate as implying tight monetary policy, even when rapid money growth and high inflation suggested the opposite. In addition, the use of the nominal interest rate as an instrument could lead to situations where the rate was pegged even though macroeconomic stabilization required a changing interest rate. In evaluating Friedman's position, Dornbusch and Fischer (1978, p. 517) observed: "Each of these arguments on the dangers of conducting monetary policy by reference to nominal interest rates is important." The arguments led to Friedman's preference for a monetary base instrument—with the aim of constant growth in the money stock (M2)[29]—over an interest-rate instrument. Friedman's recommendations thus comprised both a change in target (toward constant growth in money) and a change in instrument (toward the use of the monetary base, or, in some presentations, total reserves).[30]

But these policy positions were never the central core of monetarist doctrine. Indeed, in listing the basic propositions of monetarism, Friedman (1970b) did not include the constant-money-growth rule or the base-instrument prescriptions. Instead, monetarist propositions were defined as propositions about the structure of the economy and the effects of monetary policy. Friedman (1983, p. 4) went on to note that while he favored a constant money growth rule, "some monetarists favor varying the rate of growth in accordance with one or another rule." He subsequently observed:

> Historically, monetarist policy has become associated with a particular prescription—slow, steady monetary growth. That is not a necessary implication of monetarist theory. A believer in monetarist theory still can favor an activist monetary policy as a way to offset other changes in the economy… (Friedman, 1984, p. 3.)

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[28] See e.g. Friedman (1960, 1968, 1970b).

[29] Friedman and Schwartz (1963a) used a monetary aggregate that included currency, demand and time deposits, and so was similar to (though narrower in definition than) the monetary aggregate now defined officially as M2.

[30] Friedman's desire that monetary authorities use a monetary quantity as an instrument was conceptually distinct from his advocacy of monetary targeting. Advocacy of an M2 target is not in itself a rejection of the interest rate as an instrument, since the interest rate in principle could be varied so as to hit the M2 target.

But he added:

> So far as monetarist theory is concerned, it will continue to be the bread and butter of monetary economics. (Friedman, 1984, p. 4.)

Both New Keynesian economics and modern monetary policy practice can be thought of as indeed accepting monetarist theory as "the bread and butter of monetary economics." The Friedman policy prescriptions of constant money growth and a base instrument have been rejected, but many core theoretical and empirical propositions of monetarism have been incorporated into the mainstream. Two central monetarist propositions—the nominal rate/real rate distinction; and the need for inflation control to be assigned to monetary policy—now guide the formulation of interest-rate policy by central banks in a way that they did not in the 1970s. Consequently, the recommendation that central banks move to a quantity instrument has fallen by the wayside, with monetary policy successes reducing the case for this reform.

Friedman understood that interest-rate instrument rules could in principle deliver stable inflation, and that the choice between the interest rate and the monetary base as an instrument was consequently a tactical, not a strategic, matter.[31] But actual experience with interest-rate rules in most countries up to the late 1970s was discouraging. With policymakers apparently unwilling or unable to make the interest-rate decisions needed to restore price stability, a base instrument rule had merits as an automatic means of delivering the needed movements in interest rates. To repeat, the switch in many countries after the late 1970s to more stabilizing interest-rate rules did not come by accident, but arose from acceptance of core monetarist propositions. The foundation of that regime change, and of interest-rate decisions today, is acceptance of Friedman's (1980a) position, noted earlier, that "monetary restraint is a sufficient condition for controlling inflation."

Financial innovations, such as sweeps programs and interest payments on money, have loosened the relationship between many monetary aggregates and nominal GDP. With some monetary aggregates (e.g., M1 in the United States) affected more seriously by innovation than others, defining money has become a more difficult empirical task. In light of these developments, the most durable aspects of monetarist theory are those that hold even in

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[31] See, for example, Friedman (1980b).

environments where there are not reliable money data. We listed and elaborated upon these aspects of monetarism in the preceding sections, with particular reference to Friedman's work.

At the same time, financial change is not in itself a legitimate reason for not devoting resources to the careful measurement and study of money, nor a basis for ignoring monetary aggregates when making policy decisions. What is more, the value of money (both as an indicator and as a candidate policy instrument) is likely to increase when short-term nominal interest rates reach very low values, as in the cases of Japan in the 1990s and the United States in the Great Depression. We consider those cases in detail in the next section. Monetary aggregates may also be valuable data for central banks that have occasion to intervene in the foreign exchange market. Information on base money becomes useful because central-bank sterilization of the exchange transaction—i.e., operations in domestic securities markets that offset the impact of the foreign exchange operation on the aggregate level of base money—may be the most reliable means of ensuring that the intervention does not produce an unintended change in aggregate demand.

## *6. Evidence contradicting claims for a liquidity trap in the United States in the 1930s and in Japan in the 1990s*

### *United States*

As Friedman and Schwartz (1963b, p. 52) emphasize, the Federal Reserve's behavior in the course of the 1929–33 Great Contraction can be broken into an initial period of monetary restriction until 1930, and a period of monetary collapse from 1930, intensified by specific Federal Reserve actions from late 1931. The fact that the situation deteriorated from 1930 should not detract from the fact that monetary policy was already highly restrictive in 1928–30. Krugman claims that Friedman's AEA Presidential Address (Friedman, 1968) engaged in crude assertion by stating that the Federal Reserve "permitted a sharp reduction in the monetary base." In fact, the monetary base declined over 5 percent from April 1928 to October 1930 (Friedman and Schwartz, 1963a, pp. 290, 340–342, and 803). It was this initial period of monetary restriction that Friedman was referring to in his AEA Presidential Address. Moreover, he was not suddenly emphasizing a theme that had not been raised by himself and Schwartz in previous accounts; the accounts of the Great Contraction in Friedman and Schwartz (1963a, 1963b) noted

the monetary tightness of the 1920s, and Friedman (1962, p. 46) referred to the "unusually tight monetary conditions" of 1928–30. The role of the Federal Reserve in producing the initial economic downturn is also stressed by Bernanke (2002), who referred to the "policy tightening of 1928–29."

But it was the severe contraction from late 1930 that transformed the downturn into a Depression. The coexistence of a depressed economy and low nominal interest rates in the 1930s prompted Keynes (1936) to introduce the concept of a liquidity trap on which Krugman places such emphasis.[32] Keynes himself expressed some quibbles about its empirical validity, but on the whole came out in favor of the liquidity trap as a relevant concept for analyzing the conditions of the 1930s.[33]

In surveying situations in which short-term nominal interest rates have fallen to zero or close to that, and aggregate demand is depressed, some economists look for a liquidity trap. An open market purchase by the central bank cannot reduce the interest rate already at the zero bound. In such circumstances, monetary policy may be helpless according to the theory. Keynes referred to a low level of the long-term rate of interest, not the short-term rate, but for supporters of a liquidity trap currently, it is often enough to invoke it as relevant whenever short-term nominal rates are at the zero bound. For them, it seems, no further substantiation is needed.

Economists like Krugman interpret the phenomena of the United States in the 1930s and in Japan in the 1990s as examples of a liquidity trap. But examination of the actual policies of the Federal Reserve and the Bank of Japan provides evidence that refutes the liquidity trap interpretation.

It is well known that the majority of Federal Reserve policymakers during the Great Depression opposed open market purchases, an option that a minority advocated as a means of invigorating the economy. The opposition had nothing to do with the liquidity trap notion. The opposition to open market purchases arose from adherence to the real bills doctrine. The real bills doctrine taught that Fed purchases of government securities were an illegitimate, speculative means of carrying out monetary policy. Only commercial bank borrowing at the discount window of the Fed was an acceptable way for monetary policy to proceed, because such

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[32] The name, liquidity trap, was originated by Dennis Robertson (see, for example, Robertson, 1940); Keynes did not name the concept. Hawtrey's (1932) "credit deadlock" concept closely overlaps with the vision of monetary policy ineffectiveness seen in the liquidity trap scenario; see Laidler (2007).

[33] Friedman (1972a) documented the preponderance of references in the *General Theory* to the liquidity trap.

borrowing was assumed to be for productive purposes, i.e., to underpin projects that expanded the stock of productive capital. Over and above their adherence to this flawed doctrine, opponents of expansive monetary policy operations believed that existing low nominal interest rates were evidence that monetary ease had already been achieved. This perspective was distinct from the liquidity trap view. In a liquidity trap, further monetary expansion is ineffective at adding to any economic activity; while the Federal Reserve position was that monetary policy had been made sufficiently expansive for productive investment to proceed, and that additional ease, while possible, was undesirable because it would stimulate speculative activity.

To make the case that the liquidity trap idea is relevant for understanding the 1930s, its proponents should have been able to cite instances of expansionary measures by the Federal Reserve—either reductions in reserve requirements on commercial banks, or Fed open market purchases that increased bank reserves—which did not lead to creation of more bank deposits, or which led to deposit creation but failed to induce the public to spend any of their additional money balances. But no such instances can be cited. There was no action on the part of the Federal Reserve to reduce reserve requirements during the 1930s; and there was no support for an open market purchase until April 1932, when, to forestall Congressional plans to adopt measures that the Fed perceived as inflationary, the Fed finally undertook a systematic open market purchase program—one moderate in scale compared to what would have been desirable, but still a substantial change in policy. The record shows that the operation resulted in an increase in the money supply, industrial production, and wholesale prices in the late summer and fall of 1932. The general improvement of the economy led observers within the Fed to give weight to the possibility that July 1932 might be classified as the trough of the Great Contraction. It was not to be. The Fed ceased open market purchases in August 1932 after Congress adjourned. If purchases had been kept up, the collapse of the economy in Winter 1933 might not have occurred (see Meltzer, 2003, pp. 372–373).

It is on the issue of Federal Reserve behavior in the early 1930s that Krugman makes some of his most serious accusations against Friedman. Essentially, Krugman argues that Friedman's post-1963 writings distorted the message of the *Monetary History*. But Krugman's accusations are baseless, as we now show.

Contrary to Krugman's suggestion, the description of 1930s monetary policy as deflationary is not something Friedman thought up in 1967[34] to distort the *Monetary History*. Friedman and Schwartz (1963b, p. 52) referred to "deflationary actions on the part of the Federal Reserve System" in the 1930s in their paper "Money and Business Cycles." And the 2002 talk by Ben Bernanke twice characterized the 1930s as featuring "contractionary monetary policies," not unlike Friedman's description. Another expert on this period, Christina Romer, notes that "the Federal Reserve deliberately raised the discount rate and as a consequence lowered the money supply substantially further" in 1931 (Romer, 1993, p. 32). Friedman's description of Federal Reserve policy as deflationary is consistent and accurate.

Krugman contends that Friedman distorted the *Monetary History* in journalistic outlets, offering as evidence Friedman's statement that the Depression was "produced by government mismanagement."[35] But the Friedman statement is not a distortion. A comparable formulation was used by Bernanke, who noted that the Federal Reserve failed to execute its duty "to improve the management of banking panics." There was, in short, government mismanagement.

As Bernanke (2002) noted, banking panics prior to the creation of the Federal Reserve had had a circuit-breaker, because of the convention for clearinghouse associations to make arrangements that supported banks that were basically sound but suffering from deposit runs. The Federal Reserve's existence was thought to have made such arrangements redundant: private institutions no longer had to serve as surrogate central banks (see Bernanke, 1983, pp. 259–260; Timberlake, 1984). But as Friedman and Bernanke note, the Federal Reserve in the 1930s did not carry out the central banking function expected of it.

If Friedman's intention was to distort the *Monetary History* to noneconomist readers, then his 1973 *Playboy* interview[36] offered an ideal opportunity. Yet Friedman told *Playboy*:

> Just as banks all around the country were closing, the Fed raised the discount rate; that's the rate they charge for loans to banks. Bank failures consequently increased spectacularly. We might have had an economic downturn in the thirties anyway, but in the absence of the Federal Reserve System—with its enormous power to make a bad situation worse—it wouldn't have

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[34] For his address in Friedman (1968), where he referred to the "highly deflationary policies" of the Federal Reserve in the Great Contraction.

[35] Incidentally, Krugman's brings this quotation into his essay by writing, "By 1976 Friedman was telling readers of *Newsweek* that "the elementary truth is that the Great Depression was produced by government mismanagement,'…" This is another inaccuracy in Krugman's essay, for the quoted passage (from Friedman, 1976b) did not appear in *Newsweek*.

[36] Norman (1973).

been anything like the scale we experienced.

In this interview, Friedman clearly characterized the problem as Federal Reserve failure to support commercial banks. That was the task the Federal Reserve was assigned when it was created, and it did not exercise that function. Friedman did not imply—as Krugman (2007a) suggests—that "the Depression wouldn't have happened if only the government had kept out of the way." Furthermore, Friedman's emphasis on the discount-rate episode—a deflationary action by the Federal Reserve that compounded its inaction on the banking collapse—agrees with the *Monetary History* and with Bernanke's retrospective.

Another journalistic account by Friedman of the Great Contraction appeared in the *San Francisco Chronicle* in 1979 (Friedman, 1979). Again, the mismanagement attributed to the government is clearly identified as failure of the Federal Reserve to support the private banking system. In his 1979 article, Friedman observed:

> The Great Depression was produced by a failure of government, by a failure of monetary policy. It was produced by a failure of the Federal Reserve System to act in accordance with the intentions of those who established it….
>
> [I]t was in the management of this fundamental function of government that government failed and produced the Great Depression.

Krugman prefers to ignore the inactive and deflationary aspects of 1930s Federal Reserve policy, instead stressing the increase in the monetary base that took place from 1930 to 1933. But the 1930–33 increase in the monetary base did not reflect official ease, as Krugman implies. The growth of the base was entirely the result of an increase in the currency component as the public withdrew their deposits from banks they distrusted, and converted the deposits into currency. The other component of the monetary base—bank reserves—declined, limiting the possibility of bank lending.[37]

Krugman's (2007a) discussion takes for granted that expansion of the aggregate monetary base implies easy policy. Apparently, only the aggregate of the base should be used for studying policy. That is a strange dictum. The aggregate matters, but there is no rule prohibiting analysis of the separate components. There can be no dispute that how the base is split up between its currency and reserves components has implications for commercial banks'

[37] See Friedman and Schwartz (1963a, pp. 739–740) for tabulation of data on bank reserves over this period.

ability to increase their loans and investments (and thus create deposits). Moreover, monetary policy actions *can* ensure an increase in bank reserves. True, the division of the level of the monetary base between currency and reserves is ultimately a private sector decision. It is, however, generally *not* the case that the way an *increase* in the monetary base is split between currency and reserves is independent of monetary policy. For the circumstances that prevailed in the 1930s we can be confident that more expansionary open market operations would have prevented the reserves portion of the base from declining. The fundamental reason for this is that the Federal Reserve is always able to expand its total balance sheet at a sufficient rate so that bulges in currency demand do not translate into drains on bank reserves and so into macroeconomic instability.

Nominal interest rates were very low in the 1930s, but such an environment does not prevent expansion of the money supply from being an effective means of stimulating aggregate demand. How does monetary expansion remain effective for stimulating demand? The monetarist transmission mechanism (described, for example, in Friedman and Schwartz, 1963b, or Meltzer, 2003) offers an answer. The bringing of the short-term nominal interest rate to zero, or near zero, does not imply that the scope for monetary expansion to stimulate the economy has been exhausted. Other asset prices that matter for aggregate demand will be bid up (and corresponding implied yields on the assets lowered) by the increase in the money stock and the use of the extra money to purchase assets. Even when the nominal rate is zero, there are a great number of asset prices susceptible to influence by monetary policy.

***Japan***

Japan's experience after its stock market and property price collapse in the early 1990s was a fall in money market rates to less than 1 percent. Here too Krugman interprets the low level of market rates as proof of a liquidity trap. He takes for granted that Japan's experience is a refutation of the Friedman-Schwartz position on monetary policy's scope to stimulate the economy. He ignores the proposals for monetary expansion in Japan made by Friedman (1997) and other monetarists during the 1990s.[38]

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[38] See Orphanides (2004) for comparisons of Japan's experience in the 1990s with the conditions in the United States in the 1930s. Orphanides concludes that neither period can be described using the liquidity trap scenario.

Japan was confronted with a banking system in disarray and an unprecedented level of government debt, in addition to recessionary conditions and, eventually, a falling price level. Ambivalence was prevalent about what policy to pursue, with the Bank of Japan maintaining well into the late 1990s that low nominal interest rates were proof that it was following an easy policy. Eventually a more affirmative policy was introduced, with the "quantitative easing" program undertaken by the Japanese monetary authorities from 2001. This policy can be criticized for having been begun too late and for being too opaque compared to alternative programs of sustained monetary expansion. But in retrospect it appears that the economy *did* respond to the quantitative easing, which involved increases in the monetary base and deliberate injections of reserves into the banking system. As discussed by Ugai (2007), the empirical evidence suggests that the Bank of Japan's operations were successful in stimulating aggregate demand via the term structure and other channels. Monetary policy revived the economy and contradicted the picture of ineffective monetary policy painted by the liquidity trap story.

The monetary stimulus from 2001 is a more plausible explanation for Japan's economic recovery than Krugman's (2007a) suggestion that technological innovation stimulated a revival of investment in Japan. A technological innovation by itself would stimulate aggregate supply but not aggregate demand, and so would be a source of deflation and a worsening output gap. Monetary expansion created the conditions for nominal aggregate demand to expand and so allowed a sustained increase in real aggregate demand.

## *7. Concluding remarks*

Paul Krugman is a respected trade theorist. But he does not speak authoritatively on subjects on which he has no expertise. Monetary economics is not his field of expertise. Krugman's research background does not qualify him as an authority on Milton Friedman's work. Krugman's scholarly publications rarely mentioned Friedman and, when they did, they acknowledged the contributions of Friedman and monetarism in a way that contradicts his (2007a) essay on Friedman. Friedman's reputation is intact despite Krugman's deplorable efforts to denigrate him and his contributions.

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