

What Would Milton Friedman Say about Market Monetarism?

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This policy brief is part of a Mercatus Symposium titled “What Would Milton Friedman Say?” The symposium explores what the late Nobel laureate, economist Milton Friedman, might say about monetary policy today, as the Federal Reserve grapples with increasing inflation in the wake of the COVID-19 pandemic.

Milton Friedman is widely regarded as one of the most influential monetary economists of the 20th century. Yet despite all of the acclaim he received during his lifetime, today he is almost certainly underrated. Younger economists may not be aware of his impact on monetary policy, partly because so many of his ideas are now accepted as mainstream, but also because his most famous policy proposal—money supply targeting—now has little support within the economics profession.

Here, I will argue that had Friedman not passed away in 2006, he would likely have been supportive of the market monetarist approach to monetary policy during the Great Recession of 2008–2009. In order to explain why, we need to first consider how Friedman revolutionized monetary theory during the 1950s and 1960s and how his views increasingly shaped the direction of Fed policy after 1980.

HOW FRIEDMAN RESHAPED MONETARY THEORY AND POLICY

Friedman’s most important contribution to monetary economics was not his proposal for the Fed to target money supply growth at roughly 4% per year; rather, his critique of Keynesian economics ended up having the more enduring impact on the field. Edward Nelson’s (2020) impressive new study of Friedman identifies four key areas where Friedman dissented from mainstream opinion during the 1960s. In all four cases, Friedman had been proven right by the mid-1970s. This critique

would later become incorporated into the New Keynesian model, which contained a synthesis of monetarist and Keynesian ideas.

Here are four Keynesian ideas from the 1960s that Friedman rejected:

1. Nominal interest rates are the correct indicator of the stance of monetary policy. The Fisher effect is not important in the United States.
2. Fiscal austerity (higher taxes) is the best way to reduce excessive aggregate demand.
3. There is a stable (negative) relationship between inflation and unemployment (the “Phillips curve”).
4. Modern economies face an increasing problem of cost/push inflation, and hence wage/price controls are often the best way to control inflation.

Let’s take these one at a time.

Friedman saw monetary policy as affecting interest rates in multiple ways. Although an expansionary monetary policy would initially reduce short-term interest rates, over time it would lead to higher output, which would put upward pressure on interest rates in the medium term. In the long run, an expansionary monetary policy could lead to permanently higher inflation, which would raise long-term interest rates.

Friedman argued that interest rates were rising during the late 1960s due to higher inflation expectations. Today, that claim seems obvious, but Nelson points out that prominent Keynesians such as James Tobin rejected this claim. By the late 1970s, inflation and nominal interest rates had reached double-digit levels, and there was widespread agreement that Friedman had been correct and Tobin was wrong.¹ Nominal interest rates are not a good indicator of the stance of monetary policy.

Many Keynesians assumed that because high interest rates did not seem to be reducing inflation, monetary policy must not be very effective in slowing inflation. Today, one frequently sees the opposite argument; the claim that low interest rates show that easy money is not effective in boosting inflation. Friedman argued that the actual problem in the late 1960s was excessively rapid growth in the money supply, a view that turned out to be correct.

Because Keynesian economists wrongly assumed that monetary policy was not very effective, they advocated a contractionary fiscal policy to restrain inflation. In 1968, President Lyndon B. Johnson raised income taxes so high that the US budget went into surplus, but inflation continued to increase. Friedman had warned that fiscal policy had relatively little impact on inflation. His “permanent income theory” predicted that the public would respond to higher taxes by reducing saving. He argued that without support from monetary policy, a tight fiscal policy can only reduce

inflation by reducing the velocity of circulation. In practice, Johnson's policy of fiscal austerity had relatively little impact on velocity, and inflation remained high in 1969 and 1970.

Keynesian economists often argued that inflation was not a serious problem and indeed might be better than the alternative. This view was based on statistical studies that showed a negative relationship between inflation and unemployment, the so-called Phillips curve. In the late 1960s, Friedman and Edmund Phelps argued that the Phillips curve relationship was misleading and that in the long run, there was no reliable tradeoff between inflation and unemployment. Once the public began to expect higher inflation rates and negotiated wage agreements based on those expectations, the expansionary impact of higher inflation would fade away.

In the long run, unemployment will return to its natural rate regardless of the trend rate of inflation. By 1970, we had high inflation and high unemployment, an indication that Friedman's critique was correct. (Note that this was three years before the first oil shock, thus the "stagflation" was not produced by an adverse supply shock.) Once again, Friedman suggested that the only way to restrain inflation was by slowing the growth in the money supply. In the 1970s, we learned that high unemployment was not an effective policy for reducing inflation.

When inflation remained elevated in 1970 despite high unemployment, Keynesian economists began to doubt whether *any* sort of demand-side policy (monetary or fiscal) was effective. Instead, they blamed inflation on "cost-push" factors, such as corporate monopoly power and/or strong labor unions. Nelson cites many examples of prominent Keynesian economists supporting President Richard Nixon's wage/price controls, which were implemented in August 1971.

Friedman warned that wage/price controls merely treated the symptoms of inflation, while the root cause was excessive money growth. He suggested that although controls might lead to a temporary reduction in the rate of inflation, they could not succeed on a permanent basis without creating severe shortages in the economy. Just as Friedman feared, inflation rose even higher after the controls were phased out in the mid-1970s. Controls had merely artificially suppressed inflation, without treating the underlying problem.

In the early 1980s, the Fed finally began paying attention to Friedman's policy recommendations. Under the leadership of Paul Volcker, the Fed abandoned interest rate targeting and began focusing on the money supply. The Fed gradually reduced the money-supply growth rate, and the inflation rate fell from double digits in 1979–1981 to roughly 4 percent by late 1982. More importantly, the Fed incorporated Friedman's key insights into their policymaking going forward, and the United States never again saw persistently high rates of inflation.

In one important respect, Friedman's achievement in these four areas is even more impressive than what one might assume at first glance. In all four critiques discussed above, Friedman's claims

were made *at a time when they looked wrong*. The Fisher effect had not been a very important factor in the setting of US interest rates when inflation expectations were near zero.² This included most of the period when the price of gold was pegged at \$20.67/oz. (1879–1933) and \$35/oz. (1934–1968), as inflation expectations were generally fairly low (even as actual inflation bounced around unpredictably). Even as late as the early to mid-1960s, inflation expectations in the United States were probably not much more than 1 percent. The Fisher effect became a major factor *after* Friedman began warning about the issue.

Second, in the mid-1960s, it was widely believed that tax changes had a big impact on aggregate demand, as the Kennedy tax cuts of 1964 were followed by a strong economy (albeit perhaps for supply-side reasons). Keynesians were genuinely surprised when the big tax increase of 1968 failed to slow inflation. Third, at the time Friedman gave his famous American Economic Association presidential address in late 1967 outlining the natural rate hypothesis, a stable Phillips curve seemed quite plausible.³ Indeed, unemployment and inflation during the 1960s fit the simple Phillips curve model especially well. It was only after 1970 that the relationship completely broke down. And fourth, the Nixon wage/price controls seemed to work at first, before collapsing in the mid-1970s. Thus in all four cases, Friedman had contested the mainstream Keynesian view at a time when the orthodox approach seemed to be working fine, and in all four cases, his views were eventually vindicated.

Friedman and Anna Schwartz's *Monetary History of the United States* was especially influential in changing the views of economists on monetary policy. Prior to the book's publication in 1963, most economists assumed that monetary policy did not play a major role in the Great Depression and also that the stance of monetary policy in the United States was expansionary during the 1930s. Friedman and Schwartz produced a great deal of evidence that monetary policy was effectively contractionary during the 1930s and that rather than representing the inherent instability of capitalism, the Great Depression represented a failure of monetary policy.

Why do so many modern economists underestimate the influence of Friedman's work on monetary policy? It is partly because his preferred policy target—stable growth in a monetary aggregate such as M2—was not adopted due to concerns about unstable velocity.

In fact, Friedman was never wedded to the view that money supply targeting was the only feasible approach to monetary policy. He conceded that inflation targeting would be desirable if central banks were able to overcome the problem of policy lags. By the late 1990s, the Fed was having substantial success with a discretionary policy regime aimed at keeping inflation low and stable, and Friedman endorsed this approach in an interview with Gene Epstein:⁴

EPSTEIN: It seems you are giving Alan Greenspan qualified praise because you are suggesting that, even if you did believe in the institution, then the best way to run the Fed is to target a monetary aggregate rather than a fed funds rate.

FRIEDMAN: No, I think circumstances do make a difference. I think there is no doubt that, from 1992 to 1995, around there, there was a very sharp uptick in the velocity of M2 and that targeting money supply at that time in a rigid fashion would not have been a good thing to do.

EPSTEIN: You are saying, in effect, that the relationship between the money supply and nominal gross domestic product broke down. The old rules no longer held.

FRIEDMAN: It has always been a very loose relationship.

EPSTEIN: But it became much looser.

FRIEDMAN: Right.

EPSTEIN: To the point that you would have abandoned—

FRIEDMAN: I don't know what I would have done. I am not going to speculate on that. I only say in retrospect that Greenspan did the right thing in abandoning primary reliance on M2 during that period. Whether I would have had the sense to do that or not, I don't know.

This does not mean that Friedman's basic monetarist model had been "wrong" in the 1950s and 1960s, as the policy regime of the 1990s incorporated much of Friedman's critique of earlier versions of Keynesian economics:

1. The Fisher effect became a central part of monetary policy, most famously in the famous Taylor principle.
2. Fiscal stabilization policy was largely abandoned, and by the 1990s the Fed was given the responsibility of targeting inflation.
3. The Fed abandoned any attempt to manipulate the Phillips curve as a way of generating low unemployment. New Keynesian models took the natural rate of unemployment as a given.
4. The idea of using wage/price controls to stabilize the price level was largely abandoned.

Indeed, Brad DeLong noted that much of New Keynesian economics is based on previous monetarist models, and Robert Hall argued that "Milton was the first New Keynesian!"⁵

The success of Friedman during the 1960s can be largely attributed to the fact that he was ahead of the profession in his understanding of the implications of a change in the trend rate of inflation. Friedman suggested that "double-digit inflation and double-digit interest rates, not the elegance of theoretical reasoning or the overwhelming persuasiveness of serried masses of statistics massaged through modern computers, explain the rediscovery of money."⁶

The ability to analyze an economy with double-digit inflation requires awareness of the difference between the effects of one-time level changes and persistent growth rate changes. Friedman saw

this distinction as being central to modern macro: “As I see it, we have advanced beyond Hume in two respects only; first, we now have a more secure grasp of the quantitative magnitudes involved; second, we have gone one derivative beyond Hume.”⁷ Robert Gordon gave Friedman credit for this advance, noting that “in those days, Friedman was sort of leading the way toward a macro that was much more oriented to an inflationary environment.”⁸

We see the impact of high and volatile inflation in all four of the key Friedman critiques discussed above. Changes in the trend rate of inflation during the late 1960s made the distinction between real and nominal interest rates much more important. It also blunted the impact of fiscal policy, which at best can only produce a one-time change in the velocity of circulation, an effect quickly overwhelmed by a persistent acceleration in the money supply growth rate. Changes in inflation expectations led to continual shifts in the Phillips curve, which reduced its reliability in Keynesian macro models. And wage/price controls are almost completely ineffective when asked to do anything more than a one-time reduction in the price level, say, from squeezing cost/price margins.

Put simply, traditional monetarism is a model that works best in a world of high and volatile inflation, driven by persistent changes in the money supply growth rate. Unfortunately, that is not the world we have lived in since Friedman died in 2006.

HOW WOULD FRIEDMAN HAVE INTERPRETED THE GREAT RECESSION?

In a previous paper, I showed that prominent monetarist economists such as Anna Schwartz and Allan Meltzer adopted a somewhat “Austrian” perspective on the Great Recession.⁹ Schwartz suggested that excessive monetary stimulus had led to an asset price bubble and that the subsequent crash led to the Great Recession.¹⁰ Meltzer worried that quantitative easing programs were causing excessive growth in the monetary base.

Friedman himself was highly skeptical of the Austrian view of business cycles. In *Monetary History*, he and Schwartz suggest that asset price bubbles are not an appropriate concern of monetary policymakers.¹¹

In our view, the Board should not have made itself an “arbiter of security speculation or values” and should have paid no direct attention to the stock market boom, any more than it did the earlier Florida land boom.¹²

The economic collapse from 1929 to 1933 has produced much misunderstanding of the twenties. The widespread belief that what goes up must come down and hence also that what comes down must do so because it earlier went up, plus the dramatic stock market boom, have led many to suppose that the United States experienced severe inflation before 1929 and the Reserve System served as an engine of it. Nothing could be further from the truth. By 1923, wholesale prices had recovered only a sixth of their 1920–21 decline. From then until 1929, they fell on the average of 1 percent per year.¹³

In Friedman's view, as long as inflation is under control, the Fed should not be concerned by rapid appreciation in asset prices.

In their *Monetary History*, Friedman and Schwartz were not just arguing that monetary policy played a big role in business cycles. Their study also contained an implicit critique of the view that market economies are "inherently unstable." Their research suggested that free market capitalism would produce a stable economy if not disturbed by unstable monetary policy. So it seems unlikely that Friedman would have blamed the Great Recession of 2008–2009 on the inherent instability of capitalism.

On the other hand, right up to the end of his life, Friedman was supportive of Alan Greenspan's leadership at the Fed. The following is from 2003:

Some economists have expressed concern that recent high rates of monetary growth have created a monetary overhang that threatens future inflation. The chart indicates *that is not the case*. Velocity is precisely back to trend. There is as yet no overhang to be concerned about.

The obvious question: whence the new thermostat?

Once the banks adopted price stability as their primary goal, they were able to improve their performance drastically.

Admittedly, this is an oversimplification. The accumulation of empirical evidence on monetary phenomena, improved understanding of monetary theory, and many other phenomena doubtless played a role. But I believe they were nowhere near as important as the shift in the theoretical paradigm. The $MV = Py$ key to a good thermostat was there all along.¹⁴

So if the Great Recession was not caused by excessive monetary stimulus in the 2000s and if it did not reflect the inherent instability of capitalism, then what did cause the crash in 2008?

In my view, Friedman would likely have adopted a market monetarist perspective, blaming counterproductive steps taken by the Fed during 2008, such as the highly contractionary policy of paying interest on bank reserves. When David Beckworth questioned this decision in late 2008, he cited a similar Fed mistake from 1937—the decision to double reserve requirements at commercial banks. Friedman and Schwartz had argued that the Fed's action had contributed to the severe economic slump of 1937–1938. Friedman presumably would have noticed that higher reserve requirements and the payment of interest on bank reserves both have the same type of effect: both policies increase the demand for base money and reduce the money multiplier. Both policies are contractionary.

The best evidence of how Friedman would have viewed the Great Recession comes from his remarks about the Japanese economy of the 1990s, a period that also featured a banking crisis and

mild deflation. In a 1998 essay, Friedman pushed back strongly against the conventional wisdom that low interest rates in Japan were an indication of easy money:

Low interest rates are generally a sign that money has been tight, as in Japan; high interest rates, that money has been easy.

After the U.S. experience during the Great Depression, and after inflation and rising interest rates in the 1970s and disinflation and falling interest rates in the 1980s, I thought the fallacy of identifying tight money with high interest rates and easy money with low interest rates was dead. Apparently, old fallacies never die.¹⁵

Instead of looking at interest rates, Friedman suggested focusing on broader nominal macroeconomics aggregates. In his 1998 essay, he presented growth rate data (annual averages) for Japan during a “golden age” prior to the economic crisis (1982–1987) and the postcrisis period (1992–1997):¹⁶

Golden period 1982:2 to 1987:2:

Japan: M2 + CDs + 8.2% NGDP + 5.0% Prices + 1.7% RGDP + 3.3%

USA (1990–2007): NGDP + 5.4% Prices + 2.2% RGDP + 3.1%

Troubled Times 1992:2 to 1997:2

Japan: M2 + CDs + 2.1% NGDP + 1.3% Prices + 0.2% RGDP + 1.0%

USA (2007–12): NGDP + 2.2% Prices + 1.5% RGDP + 0.7%

I was not able to find data for the United States for M2 plus CDs, but I added figures that represent US data during our Great Moderation (1990:4–2007:4) and the subsequent 5 years (2007:4–2012:4) for comparison. These data show a slowdown that is eerily similar to what occurred in Japan during the 1990s. Given that Friedman believed that a contractionary monetary policy was to blame for Japan’s weak economy during the 1990s, it seems likely that he would have had a similar diagnosis of the Great Recession and its aftermath.

HOW WOULD FRIEDMAN HAVE RESPONDED TO MARKET MONETARISM?

Market monetarists differ from traditional monetarists such as Friedman in 2 primary ways. First, market monetarists oppose money supply targeting and instead recommend that central banks target the level of nominal GDP (perhaps along a rising trendline of 4 percent or 5 percent per year).¹⁷ Second, market monetarists argue that monetary policy should be guided by market forecasts.¹⁸ Policy should be set in a position where the market forecast of the goal variable is equal to the central bank’s policy goal. Thus, if 2 percent inflation were the goal, then the money supply and interest rates should be adjusted to the point where the market forecasts 2 percent inflation.

Friedman certainly accepted the fact that monetary policy should target nominal variables, not real variables such as real output or unemployment. Nelson quotes Friedman in 1977, looking back on his 1967 presidential address:

The essence of my argument in that paper was that the monetary authorities had a monetary instrument with which they could ultimately control only monetary variables, such as the price level and nominal income; that it is not possible to use monetary instruments to achieve a real target, whether that real target be the real interest rate or real output or unemployment rate.¹⁹

While Friedman did not favor a nominal GDP (NGDP) target, there are several pieces of evidence suggesting that Friedman viewed stable NGDP growth as a *desirable outcome*. Early in his career, Friedman was sympathetic to the basic idea of stabilizing NGDP growth:

Friedman characterized the appropriate monetary policy as one in which monetary growth was varied in a manner that offset the effects on the economy of changes in velocity.²⁰

Offsetting changes in velocity is equivalent to stabilizing NGDP.

Nelson noted that Friedman moved away from this view during the 1950s, as he became concerned that policy lags would prevent the Fed from effectively offsetting velocity shocks in a timely manner. However, this does not mean that Friedman viewed a stable NGDP growth rate as being undesirable. Indeed, his proposed money supply rule was aimed at delivering just such an outcome. Friedman argued that although velocity had been somewhat volatile at certain times in American history, this pattern mostly reflected the impact of unstable monetary policy. Velocity tended to fall during depressions and rise during inflationary booms. Friedman believed that if the money supply were to grow at a stable rate, then velocity would also become much more stable. Thus, Friedman both hoped *and expected* that his money supply growth rule would produce relatively stable growth in NGDP, at roughly 4 percent per year.

In order to be convinced that NGDP-level targeting was superior to money supply targeting, Friedman would have had to have been persuaded that the problem of “policy lags” could be overcome. Even if stable NGDP growth were theoretically superior to stable growth in a monetary aggregate, there is a danger that any attempt to directly target NGDP might lead to more unstable growth in nominal spending than if the Fed were simply to provide a steady growth rate for the broad money supply.

Later in his career, however, Friedman seemed more willing to entertain alternatives to money supply targeting. As noted earlier, in the early 2000s, Friedman conceded that Greenspan’s policy of targeting inflation had worked better than he had expected, effectively offsetting changes in the velocity of money.

A particularly interesting example of Friedman’s openness to new ideas occurs in the book *Money Mischief*,²¹ where Friedman endorsed Robert Hetzel’s proposal for an inflation-targeting regime

based on stabilizing “TIPS (Treasury inflation-protected securities) spreads.”²² The spread between the nominal yield on conventional Treasury bonds and the real yields on TIPS provides a rough estimate of the market forecast of inflation.²³ Thus, Friedman’s endorsement of Hetzel’s proposed alternative to money supply targeting is certainly consistent with the “market” part of market monetarism. It addresses the problem of policy lags by directly targeting a market price that responds immediately to changes in monetary policy. Some market monetarists have even proposed setting up an NGDP futures market to guide policy.²⁴

CONCLUSIONS

We have abundant evidence from Friedman’s comments on Japan that he would have been likely to blame America’s deflation and falling NGDP of 2009 on tight money. However, the velocity of circulation was particularly unstable during the Great Recession, and indeed, the broader monetary aggregates have not provided a good indicator of the stance of monetary policy since 2007. This fact might have led Friedman to look for alternative indicators of the stance of monetary policy, such as those he cited in his 1998 essay on Japan. Because those indicators looked quite similar in the United States and Europe during the Great Recession to Japan in the 1990s, the market monetarist analysis would likely have held great appeal to Friedman after 2008.

The market monetarist explanation of the Great Recession is consistent with Friedman’s view that market economies are inherently stable if not impacted by unstable monetary policy. Market monetarists aim for an outcome of stable growth in M^*V , which was also roughly what Friedman hoped to achieve. And market monetarists favor using market forecasts in a way that is analogous to the Hetzel proposal that was endorsed by Friedman in 1992.

Like Friedman, market monetarists are skeptical of the efficacy of fiscal policy, albeit more for reasons of “monetary offset” than crowding out or Ricardian equivalence.²⁵ As long as the central bank is targeting inflation at 2 percent, it will attempt to offset any fiscal policy initiative that is expected to move inflation off target. Like Friedman, market monetarists reject the idea that interest rates are a useful indicator of the stance of monetary policy. Like Friedman, market monetarists are skeptical of conservative explanations of depressions that focus on previous policy “excesses.” Like Friedman (and unlike many other conservatives), market monetarists believe that monetary stimulus can create jobs in a depressed economy. Like Friedman (and unlike many liberals), market monetarists believe that monetary policy continues to be highly effective at the zero lower bound on interest rates.

Unfortunately, Friedman died in 2006. Therefore, we will never know for certain how he would have viewed the dramatic events that occurred just a few years later. Based on everything we know about Friedman’s approach to monetary theory and policy, however, the market monetarist analysis seems to fit most closely with how Friedman would have interpreted the Great Recession and weak recovery of the 2010s.

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NOTES

1. Edward Nelson, *Milton Friedman and Economic Debate in the United States, 1932–1972* (Chicago: University of Chicago Press, 2020), 2:113.
2. Robert B. Barsky, “The Fisher Hypothesis and the Forecastability and Persistence of Inflation,” *Journal of Monetary Economics* 19, no. 1 (January 1987): 3–24; Scott Sumner, “The Role of the Gold Standard in Keynesian Monetary Theory,” *Economic Inquiry* 37, no. 3 (July 1999): 527–40.
3. Milton Friedman, “The Role of Monetary Policy,” *American Economic Review* 58, no. 1 (March 1968): 1–17.
4. Milton Friedman, “Mr. Market,” *Hoover Digest*, no. 1 (January 1999).
5. J. Bradford De Long, “The Triumph of Monetarism?” *Journal of Economic Perspectives* 14, no. 1 (Winter 2000): 83–94; Nelson, *Milton Friedman and Economic Debate in the United States*, 2:203.
6. Milton Friedman, “25 Years after the Rediscovery of Money: What Have We Learned? Discussion,” *American Economic Review* 65, no. 2 (May 1975): 176–79.
7. Friedman, “25 Years after the Rediscovery of Money.”
8. Nelson, *Milton Friedman and Economic Debate in the United States*, 2:214.
9. Scott Sumner, “What Would Milton Friedman Have Thought of Market Monetarism?” in *Milton Friedman: Contributions to Economics and Public Policy*, ed. Robert A. Cord and J. Daniel Hammond (Oxford: Oxford University Press, 2016), 246–64.
10. Anna J. Schwartz, “Origins of the Financial Market Crisis of 2008,” *Cato Journal* 29, no. 1 (Winter 2009): 19–23.
11. Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton, NJ: Princeton University Press, 1963), 291–98.
12. Friedman and Schwartz, *A Monetary History of the United States*, 291.
13. Friedman and Schwartz, *A Monetary History of the United States*, 298.
14. Milton Friedman, “The Fed’s Thermostat,” *Wall Street Journal*, August 19, 2003, <https://www.wsj.com/articles/SB106125694925954100#:~:text=lt%20pegs%20the%20fund%20rate,movements%20in%20velocity%20and%20output,emphasis%20added>.
15. Milton Friedman, “Reviving Japan,” *Hoover Digest*, no. 2 (April 1998).
16. Friedman, “Reviewing Japan.”

17. David Beckworth, *Facts, Fears, and Functionality of NGDP Level Targeting: A Guide to a Popular Framework for Monetary Policy* (Arlington, VA: Mercatus Center at George Mason University, September 2019).
18. Scott Sumner, "Measurement, Accountability, and Guardrails: Nudging the Fed toward a Rules-Based Policy Regime," *Cato Journal* 36, no. 2 (Spring/Summer 2016): 315-35.
19. Nelson, *Milton Friedman and Economic Debate in the United States*, 2:155-56.
20. Nelson, *Milton Friedman*, 1:379.
21. Milton Friedman, *Money Mischief* (New York: Harcourt Brace Jovanovich, 1992).
22. Robert L. Hetzel, "Maintaining Price Stability: A Proposal," *FRB Richmond Economic Review* 76, no. 2 (March/April 1990): 53-55.
23. The yield spread measures inflation expectations most precisely when the two bonds are viewed by investors as close substitutes.
24. Scott Sumner, "Using Futures Instrument Prices to Target Nominal Income," *Bulletin of Economic Research* 41, no. 2 (1989): 157-62.
25. Scott Sumner, "Why the Fiscal Multiplier Is Roughly Zero" (Mercatus on Policy, Mercatus Center at George Mason University, Arlington, VA, September 2013).