

What have economists learned about monetary policy over the past 50 years?*

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January 2008

What have economists learned about monetary policy over the past 50 years? In economic research, 50 years is a long time. I will actually start in 1967, with Milton Friedman's presidential address at the meeting of the American Economic Association, so I will only cover about 40 years. I will give a very personal view of what economists have learned since Friedman's address that is most relevant for practical monetary policy. In order to be brief, I will have to leave out many important research contributions. I will hence be very selective, eclectic, and possibly controversial.¹

Friedman's "The role of monetary policy" – a classic

The title of Friedman's presidential address was "The role of monetary policy." It was presented on December 29, 1967, and published in the *American Economic Review* in 1968 (Friedman 1968). It remains a classic and a milestone in the development of a modern monetary-policy framework.

Friedman discussed what monetary policy cannot do, what it can do, and how monetary policy should be conducted. Regarding what monetary policy *cannot* do, he noted that it cannot in the long run control real variables such as unemployment and GDP; in the long run it can only control nominal variables, such as the exchange rates, the price level, or monetary aggregates. These insights were not obvious at the time, but they are now part of the conventional wisdom.

Regarding what monetary policy *can* do, Friedman emphasized three things: First, monetary policy can avoid being a major source of disturbance. It can avoid major mistakes. Second, monetary policy can provide a stable background for the economy, preferably by achieving price stability. Finally, monetary policy can contribute to offsetting major disturbances in the economy that arise from other sources than monetary policy itself. On the last point, Friedman emphasized the danger of being too ambitious:

* A preliminary version of this paper was presented at the conference "Monetary Policy over Fifty Years" in Frankfurt am Main, September 21, 2007, on the occasion of the 50th anniversary of the Deutsche Bundesbank. All remaining errors are my own. The views, analysis, and conclusions in this paper are solely the responsibility of the author and do not necessarily agree with those of other members of the Riksbank's staff or Executive Board.

¹ Clarida, Gali, and Gertler (1999), Walsh (2003), and Woodford (2003) provide more complete coverage of recent advances in the theory of monetary policy.

[T]he potentiality of monetary policy in offsetting other forces making for instability is far more limited than is commonly believed. We simply do not know enough to be able to recognize minor disturbances when they occur or to be able to predict either what their effects will be with any precision or what monetary policy is required to offset their effects. ... In this area particularly the best is likely to be the enemy of the good. Experience suggests that the path of wisdom is to use monetary policy explicitly to offset other disturbances only when they offer a “clear and present danger.” (Friedman 1968, p. 14)

Regarding how monetary policy *should* be conducted, Friedman stated two requirements: The *first* requirement is that central banks should only target variables that they can control, such as the exchange rate, the price level, or a monetary aggregate. Friedman considered an exchange-rate target unsuitable for the U.S., since it implies adapting to the average of whatever policies monetary authorities in the rest of the world adopt. He stated that targeting the price level would in principle be best, but emphasized that control of the price level was too imperfect, with policy actions having uncertain effects on the price level with long and variable lags. Therefore, he recommended targeting a monetary aggregate, since central banks have better control over money and the lags are shorter:

[W]e cannot predict at all accurately just what effect a particular monetary action will have on the price level and, equally important, just when it will have that effect. Attempting to control directly the price level is therefore likely to make monetary policy itself a source of economic disturbances because of false stops and starts. *Perhaps, as our understanding of monetary phenomena advances, the situation will change. But at the present stage of our understanding,* the long way around seems the surer way to our objective. Accordingly, I believe that a monetary total [aggregate] is the best currently available immediate guide or criterion [target] for monetary policy... (Friedman 1968, p. 15, italics and brackets added)

Here I have emphasized Friedman’s qualification that the situation may change “as the understanding of monetary phenomena advances,” something that I will come back to.

The *second* requirement is that central banks should avoid sharp swings in policy. Therefore Friedman recommended central banks to achieve a steady but moderate rate of growth of a specified monetary aggregate – which rate of growth and particular aggregate is not so important as long as they are explicitly stated and adopted. “That is the most that we can ask from monetary policy *at our present state of knowledge,*” Friedman concluded (1968, p. 17, italics added).

Monetary targeting failed, but inflation targeting has worked fine

Monetary targeting was tried in several countries during the 1970s and 1980s. It constantly failed and was therefore abandoned. In contrast, when inflation targeting, the current best practice in monetary policy, was introduced in the 1990s in New Zealand, Canada, the U.K., Sweden, Finland, Australia, and later in many other countries, including emerging-market countries, it worked fine.

The great exception to the failure of monetary targeting appears to be the great performance in Germany by the Bundesbank, which kept inflation low and stable when inflation became high and variable in other countries. However, closer scrutiny and many studies of the Bundesbank’s monetary policy have revealed that the Bundesbank was actually an inflation targeter in disguise: Whenever there was a conflict between achieving the money-growth target and the inflation target (which was called “unavoidable inflation”, “price norm”, or “medium-term price assumption”), the Bundesbank consistently gave priority to the inflation target and willingly missed its money-growth target (see

Svensson 1999 for further discussion and references to some relevant studies). Thus, the Bundesbank's great and admirable performance actually demonstrates the success of inflation targeting, not of monetary targeting – although the success of a rather nontransparent inflation targeting.

Given the evidence, Friedman later actually changed his view about monetary targeting. Some years ago I had the opportunity to ask him personally at a conference at the San Francisco Fed whether the success of inflation targeting would make him revise his previous recommendation to target money instead of targeting inflation and the price level directly. He answered that he had indeed revised his recommendation. In an interview with *Financial Times* in June 2003, Friedman also conceded that targeting money had not been a success (London 2003). In a more recent interview with *American Prospect* in December 2005, Friedman noted that targeting the price level is easier than he previously thought it was and that central banks all over the world had succeeded in achieving price stability without his money-growth rule or other rules (Kuttner 2005).

Inflation targeting is in practice always *flexible* inflation targeting. That is, it aims to stabilize not only inflation around an inflation target but also the real economy. Furthermore, because inflation and resource utilization respond with considerable lags to monetary-policy actions, it is necessary to rely on forecasts. Flexible inflation targeting then boils down to what I have called “forecast targeting.” That is, it consists of choosing and implementing an interest-rate path such that the resulting forecasts of inflation and measures of resource utilization “look good”. “Looking good” then means that inflation approaches the inflation target and resource utilization approaches a normal level at a suitable pace.

Better knowledge about the transmission mechanism

Why has inflation targeting worked so well? I believe the reason is that central banks now have a better knowledge about the transmission mechanism of monetary policy than when Friedman gave his presidential address 40 years ago. This allows them to produce usable forecasts of inflation and resource utilization conditional on alternative interest-rate paths or interest-rate assumptions, the kind of forecasts that are a necessary requirement for forecast targeting.

The conventional wisdom about the transmission mechanism with aggregate demand and aggregate supply/Phillips curves is still relevant, but it has been much refined with better microfoundations and more transmission channels and, in particular, much better understanding of the role of expectations. It is now generally acknowledged that monetary policy works mainly through the private-sector expectations of future interest rates and future inflation that central-bank actions and statements give rise to. Those expectations matter much more than the current interest rate. That is, monetary policy is “the management of expectations,” as Michael Woodford (2005) has expressed it. A few central banks, namely the Reserve Bank of New Zealand, Norges Bank, the Riksbank, and Sedlabanki Islands (the central bank of Iceland), now choose and publish what can be interpreted as an optimal interest-rate path or plan, as a more effective and transparent implementation of policy. This practice will gradually become the norm, I believe. For instance, the Czech National Bank has announced that it will start doing this from 2008 (Czech National Bank 2007).

Theoretical research on the transmission mechanism has been paralleled by better empirical methods, including Kalman filtering, vector auto regression, and Bayesian estimation methods. The current research frontier of monetary policy seems to be the development at several central banks of empirical

Bayesian dynamic stochastic general equilibrium (DSGE) models for policy analysis, forecasting, and simulation. The Riksbank already has such a full-blown model, Ramses, in operational use (Adolfson, Laséen, Lindé, and Villani 2007). We are now in the process of developing Ramses to construct optimal policy projections, that is, to construct projections of inflation, output gaps, and the instrument rate that minimize an intertemporal loss function that represents flexible inflation targeting (Adolfson, Laséen, Lindé, and Svensson 2008).

Monetary aggregates matter little for monetary policy

We have also learned, I believe, that monetary aggregates matter little, or even not at all, for monetary policy. Credit aggregates may matter, though, through their impact on spending and as indicators of financial vulnerability. Certainly the financial unrest in the U.S. and Europe in the last few months have alerted us to the role of financial factors, credit, and risk premia in the transmission mechanism. But economic theory has not found any separate transmission channel from traditional monetary aggregates to prices. Empirically, a large amount of research has confirmed that there is little or no information in money about future inflation beyond other explanatory variables, both for high- and low-frequency fluctuations. Recent evidence on these matters were presented at the 4th ECB Central Banking Conference in November 2006; see in particular the papers by Woodford (2007a,b) and Fischer, Lenza, Pill, and Reichlin (2006). The former papers show that there is no compelling reason to assign a prominent role to monetary aggregates in the conduct of monetary policy. The latter paper does not find any evidence that ECB's monetary pillar has had any noticeable impact on ECB's interest-rate decisions.

Furthermore, I believe that Friedman's statement that "inflation is always and everywhere a monetary phenomenon" is often misunderstood (Svensson 2003a provides more discussion). It refers to a long-run *correlation* between endogenous variables, inflation and money growth, but it says nothing about *causality*, that is, which variable determines the other. The direction of causality is instead determined by the monetary-policy regime. More precisely, in general equilibrium, endogenous variables are determined by exogenous variables. Which variables are exogenous and endogenous is to some extent determined by the monetary-policy regime. Successful strict monetary targeting would make money growth effectively exogenous. Then inflation remains endogenous and long-run inflation will be determined by the exogenous money growth. Successful strict inflation targeting would make inflation effectively exogenous. Then long-run money growth remains endogenous and will be determined by exogenous inflation. A fixed exchange rate makes both inflation and money growth endogenous variables. Then both variables are determined by other, exogenous domestic and foreign variables, including foreign monetary policy.

The importance of the institutional framework

We have also learned the importance of the institutional framework for a stable and successful monetary policy. The Bundesbank has been a starting point and inspiration for later institutional developments in a number of countries, including the euro area.

Good and stable monetary policy is now seen as resting on three pillars: (1) a mandate, with priority to price stability but also with some weight on real stabilization, (2) independence, to avoid short-term political interference and to give the central bank the possibility of achieving its mandate, and (3) accountability, which improves with transparency, creates incentives for the central bank to achieve its mandate, and provides democratic control of a powerful institution. The importance of credibility

and transparency for the efficient implementation and transmission of monetary policy is also much better understood these days, and a good institutional framework contributes to the credibility of the monetary-policy regime.

Inflation bias and time-consistency problems

Whereas inflation was high in many countries during the 1970s and 1980s, we have seen much lower inflation in many countries from the 1990s. It seems as the problem of so-called inflation bias, when inflation on average becomes higher than the inflation target, has been solved. Why is this? In the classic analysis by Kydland and Prescott (1977) and by Barro and Gordon (1983), an inflation bias appears when central banks have a standard quadratic loss function (the sum of squared deviations of inflation from an inflation target and a positive weight (“lambda”) times the squared deviations of output from an output target), act to minimize this loss function under discretion, and have an overly ambitious and unrealistic output target that exceeds the natural (or potential) output level. According to the same analysis, the inflation bias disappears if the central banks commit to an appropriate simple policy rule. Does the disappearance of the inflation bias indicate that central banks have committed themselves to a simple policy rule?

As Alan Blinder (1998), I think there is a simpler explanation for the vanishing inflation bias.² I believe the main explanation is that many central banks have accepted that the long-run Phillips curve is vertical and have adjusted their output target down to the natural/potential level. Central-bank independence has allowed them to do this and resist political pressure from governments and parliaments. Thus, the central-bank commitment is rather to a particular realistic output objective, not to a particular simple policy rule. In other words, there is a commitment to a particular policy objective, not to a particular simple rule for the setting of the policy instrument. This does not exclude that more transparency in monetary policy and the requirement of good motivations for policy choices may also work as a desirable commitment mechanism for policy.

Taylor rules are robust but often overemphasized and misunderstood

Taylor rules, where the interest rate is set mechanically as a simple linear function of current inflation and output, are frequently referred to in current monetary-policy analysis. I believe that they are often overemphasized and misunderstood (Svensson 2003b provides more discussion). In many research papers, monetary policy is modelled as if the central bank were committed to follow a Taylor rule. Taylor rules are often treated as a structural equation. But no central bank has made such a commitment, and inflation-targeting central banks respond to much more information than current inflation and output. The empirical fit of Taylor rules is actually modest: I am not aware of any estimation that has a higher R-square for interest-rate changes than about 2/3, meaning that 1/3 of the variance of interest-rate changes is explained by other things than the Taylor rule. Taylor rules are actually empirical and simplified reduced forms, not structural equations. They are not optimal, and they lack microfoundations.

² Blinder made this point already in his Marshall Lectures at Cambridge University in 1995, which morphed into his Robbins Lectures at the LSE in 1996, but they were not published until his 1998 book (Blinder 1998). A similar point was later made in Svensson (1997).

But Taylor rules are quite robust, in the sense that a Taylor rule almost never works very badly in reasonable models. Why is that? I believe that the reason is that an optimal instrument rule responds to *all* the determinants of the forecasts of the target variables (inflation and resource utilization). Current inflation and output are important determinants of future inflation and output. Therefore, responding *only* to current inflation and output is not that bad and actually quite a robust policy. If the central bank knows little about the economy and the transmission mechanism but can at least observe current inflation and output, it can do much worse than following a Taylor rule. But today's inflation-targeting central banks have much more information, know more about the transmission mechanism, and therefore can do better than the Taylor rule. Consequently they respond to more information and deviate quite a bit from the Taylor rule.

What do we not know?

What do we not know, and where should we try to make progress in future research? I believe that it is desirable to do flexible inflation targeting more explicitly. This requires more work on measures of resource stabilization and potential output and raises difficult but important conceptual and empirical issues. I also believe that flexible inflation targeting would benefit from more use of explicit loss functions to evaluate alternative policy options and determine the optimal one. Norges Bank seems to be ahead of other central banks in this regard (Bergo 2007).

As every maker of monetary policy knows, the uncertainty about the transmission mechanism in the form of model uncertainty is always present and sometimes very large. We could certainly benefit from better techniques to incorporate model uncertainty in forecasts. It would also be desirable to better incorporate recent work on the modelling of financial markets and the determination of yield curves and exchange rates, the credit channel, and labor markets in the existing empirical DSGE models of the transmission mechanism for policy analysis.

Regarding the ongoing discussion about the role of asset prices in monetary policy, I believe we know enough to state that asset prices should not be targets of monetary policy. As long as their development is not a threat to financial stability and the payment system, they are relevant for monetary policy only as indicator variables, that is, only to the extent that they contain some information about the future target variables (inflation and resource utilization). However, if credit or asset-price developments indicate threats to financial stability or the payment system, this may impose restrictions on the normal conduct of monetary policy and also require special actions.

Conclusion

Friedman's presidential address 40 years ago was full of insights that are highly relevant today. He clarified what monetary policy cannot do, what it can do, and how it should be conducted. He also thought that targeting the price level directly would in principle be the best policy, but based on the state of knowledge of the transmission mechanism and central banking of his time, he thought that such a policy would be too risky. Instead he recommended targeting money growth as an indirect and safer way to achieve price stability. He was careful to qualify his recommendation and leave the possibility open that "perhaps, as our understanding of monetary phenomena advances, the situation will change." I believe that our understanding of monetary phenomena has advanced considerably in the last 40 years, that the situation has indeed changed, and that better understanding of the transmission mechanism and other macro and monetary phenomena is behind the great success of targeting inflation directly, inflation targeting.

Friedman's legacy should not be identified with monetary targeting narrowly interpreted. Instead, as emphasized by Woodford (2007b), the major and lasting insights of Friedman and other monetarists are rather that (a) central banks can control inflation and therefore they can reasonably be *held accountable* for controlling inflation and (b) a *verifiable commitment* by the central bank to price stability is important. These insights were considered unorthodox and radical 40 years ago. Now they belong to the conventional wisdom. However, the insights do not require any reference to monetary aggregates. Today's inflation-targeting central banks are indeed held accountable for controlling inflation, and the announced numerical inflation target provides the verifiable commitment, without any reference to monetary aggregates.

Furthermore, Bundesbank's legacy should not be identified with monetary targeting. Instead, Bundesbank is better described as an early (although disguised and nontransparent) inflation targeter. With its firm commitment to price stability, its defense of its independence, and its pragmatic and competent policymaking, the Bundesbank conducted German monetary policy steadily and calmly through difficult times when other central banks failed. For this, it deserves our deep appreciation and admiration.

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