

Federal Reserve Bank of Cleveland

Monetary Policy Rules and Stability: Inflation Targeting versus Price-Level Targeting

by Charles T. Carlstrom and Timothy S. Fuerst

Like Ulysses tied to the mast, most of us have committed ourselves to some extraordinary measure to overcome our weakness in the face of temptation. We may put our alarm clock across the room to ensure that we get up promptly. Even though we know we need to get up at 6:00 a.m., when 6:00 rolls around we are tempted to sleep just a “little” more. Central banks can also gain from commitment, which in their case means adopting a rule that monetary policy actions must follow. One of the earliest and most famous proposals was Milton Friedman’s constant-money-growth rule. He argued that the monetary authority should let the money supply grow at a constant rate and ignore short-run considerations, since attempts at stabilizing inflation or output would ultimately make matters worse.

With the unexpected shift in money demand in the early 1990s, Friedman’s proposal took a beating (for a good description of how the rule became ineffective after the technological innovations of the 80s and 90s, see “Canada’s Money Targeting Experiment,” a 1998 *Economic Commentary* by Paul Gomme). The relationship between money and prices is no longer as predictable as once thought. Most policymakers now recognize that a constant-growth rule will not prevent inflation from varying substantially over short and long time periods. Central banks around the world have recently turned to another type of rule, namely, inflation targeting.

A consensus is growing around the world that central banks should adopt policies that achieve low and stable rates of inflation. Inflation targeting appeals to policymakers as a way of directly accomplishing those goals. Inflation targeting also has the advantage of being an easy rule to verify. People can tell if the central bank is hitting the mark. But is inflation targeting a good rule or might it eventually break down like the money growth rule? Unfortunately, some recent research indicates that inflation-targeting rules may have a weakness that makes them unreliable tools for achieving stable inflation.

A closely related rule is a price-level target, in which the central bank promises to keep the price level within a prespecified band. Although similar, the two rules have a fundamental difference. Inflation targeting is forward-looking, as its goal is to stabilize the growth rate in prices. In contrast, price-level targeting builds in a backward-looking element because the target is the level of prices.

This *Economic Commentary* first outlines the advantages of adopting a monetary policy rule. We then examine the benefits of having a stable inflation rate to help understand why several central banks have a rule that promises to stabilize inflation. While there are some clear benefits to adopting an inflation target, we conclude that inflation targeting may be destabilizing. We suggest that price-level targeting can avoid this potential pitfall and still allow many of the benefits normally associated with inflation targeting. While a common criticism of

Monetary policy rules help central banks exercise the discipline necessary to achieve their long-term goals. The type of rule many banks are turning to these days is inflation targeting, which has several advantages. But in following the rule, banks usually base their actions on forecasts of future inflation, and this can lead to inflation-rate instability in some cases. A price-level target offers many of the same benefits as an inflation target, but because it uses past inflation to guide the bank’s actions, it avoids this vulnerability.

price-level targeting is its focus on the past, we suggest that this feature may actually be a virtue.

■ Rules versus Discretion: Time Consistent Policy

Economists have long argued that the best and surest way for a central bank to do its job is to adopt a rule and stick to it. One advantage of a rule is that it makes a central bank’s actions more transparent. Because a rule forces the bank to explicitly specify its long- and short-term objectives, the public is less apt to misinterpret the bank’s actions, making inflation stability easier to achieve. For example, a central bank may make a temporary change in policy. If the bank’s actions aren’t transparent, the public may interpret this as a change in the long-term objective of the bank. Because the reasons for the bank’s actions are not explicit, the public’s expectations about future inflation may have no moorings.

But another, more sinister problem with discretion is that a central bank's short-term objectives may be inconsistent with its long-term objectives, preventing a bank from realizing its long-run goals. A rule prevents a central bank from undermining its long-range goals for short-term results. This advantage of rules arises because of what economists often call the dynamic inconsistency problem.

An example can help clarify this problem. A central bank may want to keep inflation low. But a little extra inflation, if it's not anticipated, can bring down unemployment. So the central bank, like a dieter longing for one more cookie, is sometimes tempted to fool the public by increasing inflation to reduce unemployment. While having one cookie or two cookies a day is not necessarily bad, ten can quickly become disastrous. Similarly, if the central bank consistently tries to lower the unemployment rate, the public would understand this tendency. The extra inflation would be expected, and unemployment would no longer fall. The end result would simply be higher inflation.

Rules are meant to avoid this tendency. But for a rule to succeed it must be transparent and easily verifiable so that the public can monitor whether the central bank is fulfilling its promise. One such commitment mechanism is a low-inflation target. We examine some of the benefits associated with inflation targeting to help understand why this is becoming the rule of choice among many central banks.

■ Benefits of Inflation Targeting

Canada, England, Sweden, and New Zealand have all adopted explicit inflation targets. Operationally, this means that they have an objective to keep inflation within some prespecified band over a period of usually one to three years.

Inflation targeting appeals to so many central banks because variable inflation is thought by many to be costly. One cost of variable inflation is that if it is unanticipated, it can lead to excessive output variability. Another problem with variable inflation is the misallocation of resources caused by sticky prices. With sticky prices, an increase in the money supply will lead to an increase in the demand for the goods of firms that don't raise their price relative to those that do.

The end result is that while real output increases, resources (labor and capital) are misallocated between firms that adjust their prices and firms that cannot. Eventually, these resources flow back to where they are most valued, but adjustments are costly. Once again, inflation variability may lead to excessive variability in output.

The presumed benefit of inflation targeting is clear. If prices are predictable, firms can preset their prices without risk. Prices will be the same tomorrow whether or not firms can adjust their prices. Inflation targeting thus eliminates the inefficiencies associated with sticky prices.

■ Inflation Targeting: The Problem with Looking Ahead

To achieve an inflation target, central banks base their policy changes on inflation projections. Without such forward-looking behavior, the monetary authority would repeatedly respond to past inflation shocks, many of which are temporary, with no bearing on future inflation. The Bank of Canada sums it up this way: "There are lags of a year to 18 months or more between monetary policy changes and their effects on inflation and the economy. A chain of events is set in motion that affects consumer spending, sales, production, employment, and other economic indicators. This means that monetary policy must always be forward-looking."

While the benefit of looking ahead is clear, this approach may not provide an anchor for inflation expectations. An earlier *Economic Commentary* of ours explains some recent research that indicates an inflation target can potentially leave money growth vulnerable to what economists call sunspot events—extraneous and unpredictable events that set into motion self-fulfilling cycles of inflation expectations and realized inflation (see "Sunspots and Monetary Policy" in the recommended readings). The term "sunspots" is a misnomer since the events are not likely to be purely extraneous as the name suggests, but instead depend on some fundamental economic variable.

In general, sunspots can arise because the money supply is adjusted passively by the monetary authority. It is supplied at whatever level is necessary to achieve the target. That is, the money supply is

endogenous. Changes in the money supply can be self-fulfilling because policy decisions depend on what the public is expected to do, and the public, in turn, bases its behavior on monetary policy actions. This can lead to a well-known problem of "infinite regress," in which the public's behavior and monetary policy affect each other in turn, and there is nothing objective on which to "pin down" either. Outcomes are determined by each side's beliefs about what the other side will do.

Sunspots are endemic to a forward-looking rule because current movements in the money supply depend on expected inflation, and expected inflation depends on current movements in the money supply. Thus, an increase in expected inflation sets in motion a future increase in the money supply that is ultimately inflationary.

Because sunspots are caused by the endogeneity of the money supply, a constant money growth rule as advocated by Milton Friedman would eliminate the possibility of sunspot fluctuation. Yet, as discussed in the introduction, this rule may leave inflation unnecessarily volatile.

But inflation targeting may do the same. Inflation targeting presents central bankers with a paradox: to prevent prices from rising over the short term, they must react to changes in expected inflation. But such action may lead to self-fulfilling cycles of expected inflation, which can actually increase inflation variability.

Recent research has shown that another way to avoid the possibility of sunspots is for the monetary authority to change interest rates aggressively in response to inflation, *and* to base the bulk of the response on *past* inflation. The problem with a proactive agenda is that money growth is responding to market-determined variables. A backward-looking interest-rate rule, however, commits the central bank to moving *future* funds rates in response to *today's* price movements. This timing difference mitigates the coordination problem because the monetary authority does not "move" until long after the public has moved. Instead of responding to what the public is expected to do, the monetary authority is responding to what the public has already done.

■ **Backward-Looking Rules: Are they Time Consistent?**

Does this guideline provide us with a solution to the sunspot problem? On the surface it appears to be a reasonable candidate for a good monetary policy rule. While it would result in more inflation variability than is optimal, inflation expectations would be pinned down.

But an inflation target that is primarily backward-looking has a major drawback. It doesn't overcome the problem that rules are meant to correct. A central bank may still be tempted to go for short-term results, which undermines its long-term objective. The incentive to cheat is always there because responding to yesterday's inflation allows for more short-term variability of inflation than is desired, and looking forward "just once" comes at no cost. A central bank always has an incentive to stabilize inflation changes (by looking ahead) because this provides good results today. Occasionally reacting to only expected inflation (as in doing so today) is not a problem and indeed is beneficial. But here is the rub: repeated occasional movements quickly become systematic, and monetary policy that systematically looks forward is prone to sunspots.

Because of this, it is difficult to see how any inflation-targeting rule could be operationalized to guarantee that monetary policy is based *primarily* on past inflation. A central bank is always going to have an incentive to cheat, while at the same time a promise to look backward and not forward in setting monetary policy is not easily verifiable.

■ **Price-level Targeting: Looking Back to a Better Future**

The problem associated with forward-looking interest-rate rules is quite general. To solve it, we need a rule that is easily verifiable and *naturally* builds into it a backward-looking element. A price-level target would fill the bill. Although the two are sometimes used interchangeably, there is one crucial difference between an inflation target and a price-level target. With an inflation target, past inflation misses do not affect future policy actions. That is, there is base drift. With a price-level target, however, past misses must affect future policy actions because the monetary authority has to get the price level back

on track. To bring prices back down, the central bank must respond to increases in yesterday's inflation by increasing the funds rate today. A true multiyear price-level target does not have base drift.

An example will illustrate the point. Suppose that last year's inflation rate is 2 percent above normal. In the case of inflation targeting, this fact is relevant only if it helps in predicting the coming inflation rate. In the case of price-level targeting, this past inflation must be balanced by a central bank policy of lowering the future inflation rate to keep the price level within the target range.

Price-level targeting necessarily builds in a backward element that is crucial to avoid sunspots and effectively pin down short-term-inflation expectations and real output. The backward element built in by a price-level target minimizes other problems usually associated with inflation targets. An *Economic Commentary* by Gavin and Stockman pointed out that the base-drift problem with inflation targeting leads to a great deal of uncertainty about what the price level 5, 10, or 30 years in the future will be. The central bank may miss its inflation target by a very small percentage in some years, but if these misses are not offset, they will accumulate and may become quite large after 30 years. Therefore, a price-level target that offsets these misses will reduce the uncertainty associated with buying and selling long-term fixed bonds.

■ **Conclusion**

This *Economic Commentary* has explained why inflation targeting is attractive to many central banks. Yet despite the attractiveness, there is a potential problem that central banks may eventually run into if they adopt the rule. While inflation-targeting rules based on forecasts may work well some of the time, perhaps even most of the time, they may not always work well. Because the consequences could be severe if the rule fails, alternatives to inflation targeting are worth considering.

We suggest that a price-level target may be better than an inflation target because of its inherent backward-looking feature. This may allow the monetary authority to enjoy many of the benefits of inflation targeting without exposing inflation to potentially destabilizing shocks.

■ **Recommended Reading**

Carlstrom, Charles T., and Timothy S. Fuerst. 2001. "Monetary Policy and Self-fulfilling Expectations: The Danger of Using Forecasts." Federal Reserve Bank of Cleveland, *Economic Review* 37 (1), pp. 9–19.

Carlstrom, Charles T., and Timothy S. Fuerst. 1999. "Sunspots and Forecasts: Looking Back for a Better Future." Federal Reserve Bank of Cleveland, *Economic Commentary* (November).

Gavin, William T., and Alan C. Stockman. 1988. "The Case for Zero Inflation." Federal Reserve Bank of Cleveland, *Economic Commentary* (September 15).

Gomme, Paul. "Canada's Money Targeting Experiment." 1998. Federal Reserve Bank of Cleveland, *Economic Commentary* (February 1).

Haubrich, Joseph G. "Waiting for Policy Rules." 2000. Federal Reserve Bank of Cleveland, *Economic Commentary* (January 15).

Walsh, Carl. "The Science (and Art) of Monetary Policy." 2001. Federal Reserve Bank of San Francisco, *Economic Letter*, 2001-13.

Charles T. Carlstrom is a senior economic advisor at the Federal Reserve Bank of Cleveland. Timothy S. Fuerst is an associate professor at Bowling Green State University and a research associate at the Bank.

The views expressed here are those of the authors and not necessarily those of the Federal Reserve Bank of Cleveland, the Board of Governors of the Federal Reserve System, or its staff.

Economic Commentary is published by the Research Department of the Federal Reserve Bank of Cleveland. To receive copies or to be placed on the mailing list, e-mail your request to 4d.subscriptions@clev.frb.org or fax it to 216-579-3050. Economic Commentary is also available at the Cleveland Fed's site on the World Wide Web: www.clev.frb.org/research, where glossaries of terms are provided.

We invite comments, questions, and suggestions. E-mail us at editor@clev.frb.org.

**Federal Reserve Bank of Cleveland
Research Department
P.O. Box 6387
Cleveland, OH 44101**

Return Service Requested:

Please send corrected mailing label to the above address.

Material may be reprinted if the source is credited. Please send copies of reprinted material to the editor.

**PRSRT STD
U.S. Postage Paid
Cleveland, OH
Permit No. 385**