INFLATION TARGETING AND MONETARY POLICY RULES

JASON C. PATALINGHUG
Department of Economics and Finance
Southern Connecticut State University
501 Crescent St. New Haven, CT 06515
USA
patalinghuj1@southernct.edu

Abstract: *This paper examines the literature to try to explain the concept of inflation targeting. There are at present two competing monetary policy rules: (1) targeting rules and (2) instrument rules. The objective of this paper is to review the relative merits of these two monetary policy rules. The debate between using either an inflation targeting rule or an instrument rule debate displays the lack of consensus among economists concerning the proper specification and underlying assumptions of the inflation-targeting model which is suited for the analysis of key monetary policy issues. The paper also examines what recent studies have found about the effect of inflation targeting on emerging markets. These studies have shown that inflation targeting has been largely beneficial to emerging markets.*

Keywords: *Macroeconomics; Central Bank; Instrument Rules*

1. Introduction

The theory and practice of monetary policy has evolved in the last fifteen years from monetary targeting to inflation targeting. The instability of the relationship between monetary aggregates and goal variables, such as inflation and nominal income, in both industrialized and emerging market countries led to the diminished role of monetary targeting since 1990. Since the adoption of inflation targeting by New Zealand in 1990, more than 20 countries have also adopted this monetary policy framework. The increasing focus by central banks on an inflation rate target rather than a nominal money growth rate target has directed the research work to focus on answering the question: what are the rules for good monetary policy? There is no clear answer to this question. However, there are at present two competing policy rules: (1) targeting rules and (2) instrument rules. The objective of the paper is to review the relative merits of these two monetary policy rules.

The next section discusses the meaning of inflation targeting as gleaned from the perspectives of the key researchers in this area. Section 3 describes the key objective of inflation targeting. Section 4 analyzes the relative merits between targeting rules and instrument rules. Section 5 gives the conclusions.

2. What Is Inflation Targeting?

Bernanke, *et al.* (1999) defines inflation targeting as a monetary-policy strategy which operates within a more clearly articulated framework that commits in advance the

general objectives and tactics (but not the specific actions) of the policymakers. Mishkin (2001) identifies the five elements of inflation targeting: (1) public announcement of medium-term numerical targets for inflation; (2) an institutional commitment to price stability as the primary, long-term goal of monetary policy and a commitment to achieve the inflation goal; (3) an information inclusive strategy in which many variables, and not just monetary aggregates, are used in making decisions about monetary policy; (4) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans and objectives of monetary policymakers; and (5) increased accountability of the central bank for attaining its inflation objectives. However, Friedman (2002) argues that the conceptual logic of inflation targeting is based on the Phelps-Friedman "natural rate" model of aggregate supply which postulates that a tradeoff exists between real outcomes (e.g. employment) and nominal outcomes (e.g. inflation). The monetary authorities can exploit this trade-off over a short-run horizon, but it assumes no such trade-off in the long-run. Thus, the objective of monetary policy is expressed in terms of the inflation variable which the monetary authorities can affect both in the short-run and in the long-run.

In Bernanke's (2003) view, the inflation targeting approach can be broken down into two components: (1) a particular framework for making policy choices, and (2) a strategy for communicating the context and rationale of the policy choices to the broader public. The first component refers to the principles by which the monetary policy committee decides how to set its policy instrument (e.g. a short-term interest rate). The second component refers to the central bank's regular procedures for communicating with the government, the financial markets, and the general public. Bernanke (2003) considers the former component as "constrained discretion" because "it attempts to strike a balance between the inflexibility of strict policy rules and the potential lack of discipline and structure inherent in unfettered policymaker discretion" (p. 2). On the other hand, Bernanke rationalizes the usefulness of the latter component in terms of its ability to reduce uncertainty, focus and stabilize private sector expectations, and develop public support for inflation targeting's approach to policymaking.

Finally, Svensson (2005a) insists that his preferred definition of inflation targeting is composed of the following three elements: (1) an explicit monetary-policy objective in the form of a numerical inflation target with an increasingly explicit concern about the stability of both inflation and the real economy; (2) an internal decision process ("forecast targeting") where projections of the target variables have a prominent role and the central bank sets the instrument rate such that the forecast of the target variables "looks good" relative to the monetary-policy objective; and (3) a very high degree of transparency and accountability to allow detailed external scrutiny of central bank preference.

3. Strict Versus Flexible Inflation Targeting

One concern regarding inflation targeting is whether it ignores traditional stabilization goals. Does excessive focus on inflation result in the disappearance of concerns for output and employment? Svensson (1997, 1999, 2002, 2005a) clarifies this concern by stating that inflation targeting in practice is "flexible" inflation targeting which aims to stabilize inflation around the inflation target and puts some weight on stabilizing

the difference between actual output and potential output (the so called "output gap"). Svensson formulated a quadratic intertemporal loss function in period t,

$$L_t = (1-\delta)E_t \sum_{\tau=0}^{\infty} \delta^{\tau}[(\pi_{t+\tau} - \pi^*)^2 + \lambda x^2{}_{t+\tau}] \qquad (1)$$

where δ ($0<\delta<1$) is a discount factor, E_τ denotes expectations conditional on information available in period t, π_t and x_t denote inflation and the output gap in period t, respectively, π^* is the inflation target, and $\lambda \geq 0$ is the relative weight on output-gap stabilization. Inflation and the output gap are the target variables with target levels at π^* and zero, respectively. In this formulation, the inflation target is subject to choice, but not the output target. Thus, inflation target is the key objective.

Equation (1) describes the scope of inflation targeting depending on the particular value of the parameter λ. If $\lambda>0$, it corresponds to flexible inflation targeting, and if $\lambda=0$, it corresponds to strict inflation targeting. Svensson argues that there is no existing central bank that practices strict inflation targeting and that real-world inflation targeting is flexible inflation targeting in which the monetary-policy objectives include the stability of inflation around the inflation target as well as stability of the output gap.

4. Targeting Rules Versus Instrument Rules

Recent literature (McCallum & Nelson, 2005; Svensson, 2002, 2003, 2005b) has highlighted the targeting versus instrument rules debate. Instrument rules (sometimes called "nominal feedback rules") are defined as formulas for setting controllable instrument variables in response to current conditions, while targeting rules are classified into two types: (1) general targeting rule (or targeting regime) which is the specification of the central bank's operational objective function; and (2) special targeting rule which is an optimality condition implied by an objective function together with a specified model of the economy. At the outset, the differences between the two rules, in general terms, must be stressed. Targeting rules are assumed to possess the following characteristics: (1) while it precommits the authorities to a policy objective, the means by which the objective is to be achieved are still left to the discretion of the authorities; (2) inflation targeting replaces vague policy commitments of authorities with a clear, quantifiable commitment to the inflation rate; (3) the adoption of inflation targeting can facilitate the imposition of formal or informal sanctions on the central bank, should it fail to keep the inflation target. On the other hand, instrument rules are assumed to have the following characteristics: (1) it is simple and is a function of a small subset of information available to the central bank; (2) it commits the central bank not only to the attainment of a specific objective, but it also commits the central bank to how it is going to achieve that objective; and (3) it is a useful way of thinking about monetary policy as it allows departure from the rule when the economy is exposed to external shocks or economic crisis. (McCallum & Nelson, 2005; Svensson, 1997, 1999, 2002, 2003).

The problem of instability of the money-inflation relationships had downplayed the importance of instrument rules using monetary aggregate as an instrument such as Friedman's (1960) constant money growth rule and the instrument rules suggested by Meltzer (1987) and McCallum (1987, 1988) which use the monetary base as the instrument. However, McCallum (1999) illustrated, using an unconstrained VAR model,

the superiority of monetary base instrument compared to the interest rate instrument. Nevertheless, in actual practice, almost all central banks utilize operating procedures that are similar to use of an interest rate instrument. McCallum suggested two reasons for central bank's interest-instrument preference: (1) central banks incorrectly believe that the use of monetary base as instrument induces instability; and (2) central banks as lenders-of-last-resort need to supply base money abundantly in times of increased demand for base money.

The best-known instrument rule is the Taylor Rule (Taylor 1993, 1999a, 1999b) where the instrument rate responds only to the inflation and output gaps. Svensson (2003) restates the Taylor rule according to the following:

$$i_t = \overline{f} + f_\pi(\pi_t - \pi^*) + f_x x_t \qquad (2)$$

where i_t is the nominal interest rate in period t; $\overline{f}$ is a constant which is equal to the sum of the average short-term real interest rate and the inflation target; $(\pi_t - \pi^*)$ is the inflation gap, where π_t is the rate of inflation and $\pi^* \geq 0$ is the inflation target, $x_t = y_t - y_t^*$ is the output gap, where y_t is (log) output and y_t^* is (log) potential output. The coefficients f_π and f_x are positive.

Taylor (1993, 2000) suggested that the instrument rules should be seen as mere guidelines for monetary policy. Svensson (2003), however, argues that this makes the rules incomplete because "there are no rules for when deviations from the instrument rules are appropriate" (p. 428). He further argues that the idea of simple instrument rules as mere guidelines for monetary policy is too vague to be operational. Although Svensson insists that no central bank has made a commitment to a simple instrument rule like the Taylor rule (or announced a particular instrument rule as a guideline), there are opposing views which believe that the behavior of both the U.S.' Federal Reserve Bank and Germany's Bundesbank over the last 15-20 years fits the Taylor rule. Svensson (2003) suggests that the concept of monetary-policy rules has to be defined as a prescribed guide for monetary-policy conduct and that the monetary-policy practice is better discussed in terms of targeting rules than instrument rules because the former specifies the objectives to be achieved, by listing the target variables, the targets for those variables, and the loss function to be minimized. In addition, Svensson argues that a commitment to targeting rules has the advantages of allowing the use of all relevant information (e.g. the use of judgment) and being more robust to both disturbances and model variation than instrument rules.

In an earlier paper, Svensson (1997) makes a pitch for a commitment to targeting rules over a commitment to instrument rules. In this paper he shows that inflation targeting implies inflation forecast targeting in which the central bank's inflation forecast becomes an explicit intermediate target and results in an endogenous optimal reaction function expressing the instrument as a function of the available relevant information. In contrast, an instrument rule directly specifies the reaction function for the instrument in terms of current information.

While Svensson (1997) expresses preference for targeting rules which specify target values but not instrument settings, McCallum (1999) clarifies that a monetary policy rule is by definition a formula that specifies instrument settings. Svensson (1999) argues that inflation targeting can be interpreted as a targeting rule with a relatively explicit loss function to be minimized, and this loss function also contains concerns about the stability of the real economy. In Svensson's words, "the targeting rule can also be expressed as an

intermediate-targeting rule, 'inflation-forecast targeting', where the conditional inflation forecast is the intermediate target variable" (p. 648).

Svensson (2002) states that a simple instrument rule, like the Taylor rule, can have some advantages such as: (1) it can easily be verified by outside observers and a commitment to the rule which would therefore be technically feasible, and (2) variants of the Taylor rule have been found to be robust to different models. On the other hand, Svensson (2002) describes its disadvantages: (1) the rule will not result in an optimal outcome because it responds only to a small subset of the information about the economy available to the central bank, and it imperfectly allows responses to lagged shocks (2) the rule is incomplete because it provides no rule for departures from the rule when good judgment calls for deviation from the rule; and (3) no central bank has made commitment to follow a Taylor-like rule. Svensson (2002) concludes that a simple instrument rule is unsuitable both as description of and prescription for inflation targeting. He believes that inflation targeting is better described and prescribed as a commitment to a targeting rule which specifies operational objectives for monetary policy or which specifies operational Euler conditions for monetary policy. He suggests that an optimal targeting rule expresses the equality of the marginal rates of transformation and the marginal rates of substitution between the target variables in an operational way, and future research should be pursued along this line.

McCallum and Nelson (2005) point out that "the most critical problem with specific targeting rules is that they are obviously model-dependent…a condition that implies optimality in one model may be highly inappropriate under other specifications" (p. 599).

Svensson (2003) describes four main objections to instrument rules: (1) the simple instrument rule may be far from optimal in some circumstances. In particular, Taylor-like rule is not optimal because it contains no other important variables than inflation and the output gap; (2) a commitment to an instrument rule does not leave any room for judgmental adjustments and extra-model information; (3) a once-and-for-all commitment to an instrument rule would not allow any improvement of the rule when new information about the transmission mechanisms, the variability of shocks, or the source of shocks arrives; and (4) commitment to a simple instrument rule is far from an accurate description of current monetary policy as practiced by inflation-targeting central banks, and no actual central bank has announced or committed itself to an explicit instrument rule.

McCallum and Nelson (2005) respond to Svensson's four objections to the instrument rule: (1) Taylor rules do not comprise the entire class of simple instrument rules. The absence of other state variables in the instrument rule is not quantitatively or qualitatively important; (2) There are various ways of incorporating judgment into instrument rules (3) Woodford's (1999) timeless perspective type of commitment does permit modification of rules when new information is developed; (4) no actual central bank has announced or committed itself to an explicit objective function which is a necessary condition for either the general or the specific type of targeting rule. In contrast, description of policy procedures of actual inflation targeting central banks (e.g. Reserve Bank of New Zealand, the Bank of Canada, and the Bank of England) read more like instrument rules than specific targeting rules.

Svensson (2005b) replies that: (1) there is a growing literature by many authors that successfully applies targeting rules to monetary policy analysis; (2) nothing says that a simple and robust monetary policy rule must be an instrument rule; (3) the forecast targeting process and implementation of monetary policy is very different from the mechanical application of the simple instrument rules; (4) an instrument rule analog with a

large coefficient makes the instrument rate very volatile, thus an instrument rule is conceptually and numerically inferior to the targeting rule, and is not neutral from a determinacy point of view; and (5) the optimal targeting rule is simply the equality between the marginal rates of substitution and transformation (e.g. MRS = MRT) between the target variables (e.g. inflation and output gap). This relation is model independent.

5. Implementation of Inflation Targeting

Amato and Gerlach (2002) found that inflation targeting is a useful strategy for emerging and transition economies. They point out that there are some conditions that need to be met in order for inflation targeting to be effective. First the country implementing inflation targeting needs to have an independent central bank. Second there needs to be sound fiscal policy. Third the economy must be resilient enough to withstand changes in interest rates and exchange rates. Lastly there is a need for econometric models of the inflation process and the transmission mechanism since inflation targeting is a forward-looking process. They also found two issues that affect emerging market economies that implement inflation targeting. The first issue is how inflation targeting can coexist with exchange rate objectives. The second issue is how will the inflation target be specified.

Aizenman et al. (2011) examined the inflation targeting experiences of several emerging markets. They found out that there is a significant and strong response running from inflation to the policy interest rate in countries that publicly announce inflation targeting policies. They also found out that countries that do not perform inflation targeting place less emphasis on inflation when setting interest rates.

Table 1 List of Selected Countries That Have Implemented Inflation Targeting

Country	Year of Adoption	Initial Inflation (%)	Final Inflation (%)	Percentage Point Change
Brazil	1999	8.7	7.9	-0.8
Chile	1991	21.8	7.2	-14.6
Colombia	2000	22.8	6.9	-15.9
Czech Republic	1998	3.8	3.5	-0.3
Hungary	2001	15.3	5.9	-9.4
Israel	1992	17.2	6.1	-11.1
Mexico	1999	21.8	7.2	-14.6
Peru	1994	48.6	6.6	-42.0
Philippines	2002	11.3	5.0	-6.3
Poland	1999	22.8	4.5	-18.3
South Africa	2000	12.3	5.2	-7.1
South Korea	1998	7.4	3.4	-4.0
Thailand	2000	5.4	2.2	-3.3

Source: Goncalves and Salles (2008)

Table 1 shows several countries that have implemented inflation targeting during the 1990s and 2000s. These countries have shown decreases in their inflation rates after the

implementation of inflation targeting. Goncalves and Salles (2008) found that even accounting for mean reversion, the inflation rate fell more for countries that have implemented inflation targeting as opposed to those that did not. Their findings found out that the inflation targeting regime is beneficial to emerging economies.

Taguchi and Kato (2010) examined four Asian economies (Indonesia, South Korea, Thailand and the Philippines) that used inflation targeting following the 1997-1998 Asian financial crisis. They found that inflation targeting worked well to rein in inflation in all of the economies except the Philippines. The inflation targeting mechanisms these countries adopted also led to increased monetary autonomy.

6. Conclusion

This paper highlights the lack of agreement among economists on certain issues concerning monetary policy rules. The targeting rule-instrument rule debate shows the lack of consensus concerning the appropriate specification and underlying assumptions of the inflation-targeting model suitable for analysis of key monetary policy issues. Thus, the realistic conclusion is simply that different models lead to different alleged implications for monetary policy.

This paper also examined recent literature on the implementation of inflation targeting in emerging economies. The studies examined in the paper found that inflation targeting has been largely beneficial to emerging markets.

Two possible areas for future research are (1) studies searching for a rule that works well in a variety of models (the Taylor-McCallum approach), and (2) studies searching for an optimal rule relative to a particular model (the Svensson approach). Both approaches emphasize the importance of operationality of any proposed rule.

References:

[1] Aizenman, J., Hutchison, M., & Noy, I. (2011). Inflation targeting and real exchange rates in emerging markets. *World Development, 39*(5), 712-724.

[2] Amato, J. D,. & Gerlach, S. (2002). Inflation targeting in emerging market and transition economies: Lessons after a decade. *European Economic Review, 46*(4-5), 781–790.

[3] Bernanke, B. (2003). *A perspective on inflation targeting*. Remarks at the Annual Washington Policy Conference of the National Association of Business Economists, Washington, DC.

[4] Bernanke, B., Laubach, T., Mishkin, F., & Posen, A. (1999). *Inflation targeting: Lessons from the international experience.* Princeton, NJ: Princeton University Press.

[5] Friedman, B. (2002). The use and meaning of words in central banking: Inflation targeting, credibility, and transparency. National Bureau of Economic Research Working Paper No. 8972.

[6] Friedman, M. (1960). *A program for monetary stability.* New York: Fordham University Press.

[7] Goncalves, C. E. S., & Salles, J. M. (2008). Inflation targeting in emerging economies: What do the data say? *Journal of Development Economics, 8*(1-2), 312–318.

[8] McCallum, B. (1987). The case for rules in the conduct of monetary policy: A concrete example. *Federal Reserve Bank of Richmond Economic Review* (September-October), 10-18.

[9] McCallum, B. (1988). Robustness properties of a rule for monetary policy. *Carnegie-Rochester Conference Series on Public Policy, 29,* 173-204.

[10] McCallum, B. (1999). Issues in the design of monetary policy rules. In J. Taylor & M. Woodford (Ed.), *Handbook of macroeconomics: Vol. 1C*. (pp. 1483-1530). Amsterdam: Elsevier.

[11] McCallum, B., & Nelson, E. (2005). Targeting versus instrument rules for monetary policy. *Federal Reserve Bank of St. Louis Review, 87*(5), 597-611.

[12] Meltzer, A. (1987). Limits of short sun stabilization policy: Presidential address to the Western Economic Association, July 3, 1986. *Economic Inquiry, 25*(1), 1-14.

[13] Mishkin, F. (2001). From monetary targeting to inflation targeting: Lessons from the industrialized countries. World Bank Policy Research Working Paper No. 2684.

[14] Svensson, L. (1997). Inflation forecast targeting: Implementing and monitoring inflation targets. *European Economic Review, 41*(6), 1111-1146.

[15] Svensson, L. (1999). Inflation targeting as monetary policy rule. *Journal of Monetary Economics, 43*(3), 607-654.

[16] Svensson, L. (2002). *Inflation targeting: Should it be modeled as an instrument rule or a targeting rule?* National Bureau of Economic Research Working Paper No. 8925.

[17] Svensson, L. (2003). What is wrong with Taylor rules? Using judgment in monetary policy through targeting rules. *Journal of Economic Literature, 41*(2), 426-477.

[18] Svensson, L. (2005a). *Optimal inflation targeting: Further development of inflation targeting.* Paper prepared for the Central Bank of Chile Conference on Monetary Policy Under Inflation Targeting, Santiago, Chile.

[19] Svennsson, L. (2005b). Targeting versus instrument rules for monetary policy: What is wrong with McCallum and Nelson? *Federal Reserve Bank of St. Louis Review, 87*(5), 613-625.

[20] Taguchi, H., & Kato, C. (2011). Assessing the performance of inflation targeting in East Asian economies. *Asian-Pacific Economic Literature, 25*(1), 93-102.

[21] Taylor, J. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy, 39,* 195-214.

[22] Taylor, J. (1999a). A historical analysis of monetary policy rules. In J. Taylor (Ed.), *Monetary policy rules.* Chicago: University of Chicago Press.

[23] Taylor, J. (1999b). The robustness and efficiency of monetary policy rules as guidelines for interest rate setting by the European Central Bank. *Journal of Monetary Economics, 43*(3), 655-679.

[24] Taylor, J. (2000). Using Monetary Policy Rules in Emerging Market Economies. *Stabilization and Monetary Policy: The International Experience* (pp. 441-457). Mexico City: Banco de Mexico.

[25] Woodford, M. (1999). Commentary: How Should Monetary Policy Be Conducted in an Era of Price Stability? *New Challenges for Monetary Policy: A Symposium Sponsored by the Federal Reserve Bank of Kansas City* (pp. 277-316). Kansas City, MO: Federal Reserve Bank of Kansas City.