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# Inflation Targeting

Κωνσταντίνος Τζανάκης

Επιβλέπων Καθηγητής: Επικ. Καθηγητής Νικόλαος Κουρογένης

Τριμελής Επιτροπή

Επικ. Καθηγητής Νικόλαος Κουρογένης

Καθηγητής Νικόλαος Απέργης

Καθηγητής Άγγελος Αντζουλάτος

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# *Inflation Targeting*

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## Summary

The main thesis presents the concept of inflation targeting (IT). We begin with a brief history of inflation targeting and present some of its key elements. Based on recent literature we lay out the whole concept of IT mentioning advantages, disadvantages and critiques of the IT model. Our main focus is the European Union, its monetary policy and what are the current objectives of the European Central Bank.

## 1.1 Introduction

Inflation targeting (IT) was first adopted in the early 1990s by industrial countries, but is being adopted by a growing number of emerging market and developing countries as well. The pioneer of inflation targeting New Zealand adopted IT in 1989, since then, inflation targeting has been adopted by many industrialized countries (New Zealand, Canada, the United Kingdom, Sweden, Israel, Australia and Switzerland), by several emerging market countries (Chile, Brazil, Korea, Thailand, and South Africa) and by several transition countries (Czech Republic, Poland and Hungary).

An inflation target is a numerical point or range for the inflation of a given price index that the central bank declares to be its objective for inflation. A large number of central banks have adopted inflation targeting as their framework for monetary policy. There are however, several and sometimes competing or conflicting definitions, reflecting the numerous variations encountered in policy practice and the evolution of the framework itself. In a thorough study of the first experiences with inflation targeting, Bernanke et al (1999) suggested the following description:

"Inflation targeting is a framework for monetary policy characterized by the public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons, and by explicit acknowledgement that low, stable inflation is monetary policy's primary long-run goal. Among other important features of inflation targeting are vigorous efforts to communicate with the public about the plans and objectives of the monetary authorities, and, in many cases, mechanisms that strengthen the central bank's accountability for attaining those objectives" (Bernanke et al. 1999, p. 4).

A distinguishing characteristic of inflation targeting is that it is a monetary policy framework that focuses maximum attention on the ultimate objective of price stability, and indeed forces close monitoring of current and prospective developments in aggregate prices both as a means to guiding current policy and as means to evaluating past policy actions. By encouraging an ongoing open dialogue between the central bank and the government, the public and financial market participants, the inflation targeting approach leaves little room for neglecting price stability, further reinforcing its

unique focus. For these reasons, inflation targeting may be particularly effective as a monetary policy framework for central banks that are institutionally challenged in some way, for instance because they lack a history of political independence or because they have an impaired credibility in pursuing monetary stability oriented policies. The intrusion of politics into monetary policy decisions as well as the pursuit of multiple and possibly conflicting objectives are potential sources of such impaired credibility with regard to a central bank's commitment to achieving and maintaining price stability. Inflation targeting helps guard against these forces.

Conversely, not all central banks with a mandate specifying price stability as the primary objective and having operational independence to pursue this objective are inflation targeting central banks. An example in this category is the European Central Bank (ECB), part of the European System of Central Banks (ESCB). The ECB's monetary policy framework identifies price stability as its primary focus. Indeed, both the independence of the ECB as well as its price stability mandate are enshrined in the Treaty establishing the European Community. According to the Treaty: "The primary objective of the ESCB shall be to maintain price stability". However, the ECB is also instructed to do whatever else it can to enhance the welfare of European citizens. This is why the Treaty continues: "Without prejudice to the objective of price stability the ESCB shall support the general economic policies in the Community". But the mandate is explicitly hierarchical, with emphasis on the primary nature of price stability as the Bank's objective.

The objective of the European Central Bank regarding IT will be discussed further down this paper however it is a good point to mention that the ECB aims to keep inflation below but close to 2 percent. Central banks that have a quantified inflation objective do structure the communication of their monetary policy around this objective. Table 1 shows how various central banks currently define their inflation objectives, as reported on the central banks' websites.

TABLE 1

**Inflation objectives in selected Organization for Economic Cooperation and Development countries and in the euro area**

Euro area	The primary objective of the European Central Bank's (ECB) monetary policy is to maintain price stability. The ECB aims at (harmonized index of consumer prices, or HICP) inflation rates of below, but close to, 2 percent over the medium term.
Australia	In pursuing the goal of medium-term price stability, both the bank and the government agree on the objective of keeping consumer price inflation between 2 percent and 3 percent, on average, over the cycle. This formulation allows for the natural short-run variation in inflation over the business cycle while preserving a clearly identifiable performance benchmark over time.
Canada	The Bank of Canada aims to keep inflation at the 2 percent target, the midpoint of the 1 percent to 3 percent inflation-control target range. This target is expressed in terms of total Consumer Price Index (CPI) inflation, but the bank uses a measure of core inflation as an operational guide. Core inflation provides a better measure of the underlying trend of inflation and tends to be a better predictor of future changes in the total CPI.
New Zealand	The Reserve Bank uses monetary policy to maintain price stability as defined in the policy targets agreement (PTA). The current PTA requires the bank to keep inflation between 1 percent and 3 percent on average over the medium term. The bank implements monetary policy by setting the official cash rate (OCR), which is reviewed eight times a year.
Norway	The government has defined an inflation target for monetary policy in Norway. The operational target is an inflation rate of 2.5 percent over time (with annual consumer price inflation of approximately 2.5 percent over time).
Sweden	According to the Sveriges Riksbank Act, the objective of monetary policy is to "maintain price stability." The Riksbank [or the central bank of Sweden] has interpreted this objective to mean a low, stable rate of inflation. More precisely, the Riksbank's objective is to keep inflation around 2 percent per year, as measured by the annual change in the Consumer Price Index (CPI). There is a tolerance range of plus/minus 1 percentage point around this target. At the same time, the range is an expression of the Riksbank's ambition to limit such deviations. In order to keep inflation around 2 percent, the Riksbank adjusts its key interest rate, the repo rate.
Switzerland	The Swiss National Bank equates price stability with a rise in the national Consumer Price Index (CPI) of less than 2 percent per annum. In so doing, it takes account of the fact that not every price movement is necessarily inflationary in nature. Furthermore, it believes that inflation cannot be measured accurately. Measurement problems arise, for example, when the quality of goods and services improves. Such changes are not properly accounted for in the CPI; as a result, the measured level of inflation will tend to be slightly overstated.
United Kingdom	A principal objective of any central bank is to safeguard the value of the currency in terms of what it will purchase. Rising prices—inflation—reduces the value of money. ... In May 1997, the government gave the bank independence to set monetary policy by deciding the level of interest rates to meet the government's inflation target—currently 2 percent. [The inflation target of 2 percent is expressed in terms of an annual rate of inflation based on the Consumer Prices Index (CPI).]

Sources: European Central Bank, [www.ecb.int/mcipo/html/index.en.html](http://www.ecb.int/mcipo/html/index.en.html); Reserve Bank of Australia, [www.rba.gov.au/MonetaryPolicy/](http://www.rba.gov.au/MonetaryPolicy/); Bank of Canada, [www.bank-banque-canada.ca/en/monetary/monetary\\_main.html](http://www.bank-banque-canada.ca/en/monetary/monetary_main.html); Reserve Bank of New Zealand, [www.rbnz.govt.nz/monpol/index.html](http://www.rbnz.govt.nz/monpol/index.html); Norges Bank, [www.norges-bank.no/Pages/Section\\_\\_\\_\\_\\_11330.aspx](http://www.norges-bank.no/Pages/Section_____11330.aspx); Sveriges Riksbank, [www.riksbank.com/templates/SectionStart.aspx?id=10602](http://www.riksbank.com/templates/SectionStart.aspx?id=10602); Swiss National Bank, [www.snb.ch/en/about/monpol](http://www.snb.ch/en/about/monpol); and Bank of England, [www.bankofengland.co.uk/monetarypolicy/Index.htm](http://www.bankofengland.co.uk/monetarypolicy/Index.htm).

Table Source: Marie Diron, Benoit Mojon. 2008. "Are inflation targets good inflation forecasts?" *Economic Perspectives*. Federal Reserve Bank of Chicago, p. 34

## 1.2 Brief History of Inflation Targeting

Early proposals of monetary systems targeting the price level or the inflation rate, rather than the exchange rate, followed the general crisis of the gold standard after World War I. Irving Fisher proposed a "compensated dollar" system in which the gold content in paper money would vary with the price of goods in terms of gold, so that the price level in terms of paper money would stay fixed. Fisher's proposal was a first attempt to target prices while retaining the automatic functioning of the gold standard. In his tract on monetary reform (1923), John Maynard Keynes advocated what we would now call an inflation targeting scheme. In the context of sudden inflations and deflations in the international economy right after World War I, Keynes recommended a policy of exchange rate flexibility, appreciating the currency as a response to international inflation and depreciating it when there are international deflationary forces, so that internal prices remained more or less stable. Interest in inflation targeting schemes waned during the Bretton Woods system (1944-1971), as they are normally inconsistent with exchange rate pegs such as those prevailing during three decades after World War II.

The theoretical work of IT was done almost contemporaneously with the practical work. It took place in a very short period of time, in the late 1980s early 1990s, where the first actual inflation targeter was the Reserve Bank of New Zealand in 1989, followed by the Bank of Canada in 1991 and then the Bank of England in 1992.

All three of those countries with IT experience, thought to be successful. Their previous experience with their governments and their central banks were seen as being very loose with monetary policy and more importantly, very inconsistent in their goals for a long period of time. As a result, they suffered inflation spirals whenever an external or fiscal shock hit. New Zealand for example, in the mid-1980s had some very real competitiveness problems, and every time it tried to devalue its currency, it would suffer a huge spike in inflation. The United Kingdom on the other hand, had been in and out of price stability even under Margaret Thatcher's monetarism watch. The British government tried to link to the European ERM, but dropped out of it when it was too costly to follow German interest rates, and everyone thought that dropping out was going to lead to an inflation spiral. Once however, the British and Kiwi central banks adopted inflation targeting, all that stopped. The same was true for Canada after adopting inflation targeting. Canada had a real problem before their IT adoption, regarding its increased stability of prices in the face of commodity or exchange rate shocks.

The debate over inflation targeting is whether it works for central banks which did not have a major credibility problem to begin with, as those smaller nations with high average inflation did. In the UK example which we already discussed, at the period when they dropped out of the ERM in 1992, the value of the pound fell sharply and in the 1970s and 1980s they had to raise interest rates massively or suffer through an acceleration of domestic inflation. The problem was solved when the Bank of England announced an inflation target within a month of leaving the ERM, and British inflation expectations were anchored as a result. The bank was then able to cut interest rates very quickly without hurting the economy.

Another example was Brazil during the Asian crisis. There was a lot of worry in 1997 and 1998 that major emerging markets would suffer spillovers from the crises in Thailand, South Korea, and others, as interest rates rose to support those currencies. Brazil was facing tighter credit conditions from abroad and somewhat diminished export demand as a result of the crisis. The central bank however, which had an inflation target, was able to avoid tightening monetary policy without having to hurt the economy. Some of the other central banks in Latin America, which had either less credible commitments to price stability or more rigid systems for their monetary policy, ended up crashing and having severe slowdowns.

Inflation targeting involves rather more than just targeting the rate of inflation as an objective of economic policy. In theory, a major virtue of quantified inflation objectives is to anchor inflation expectations, a key ingredient for the success of monetary policy. By anchoring expectations you try to convince people that whatever happens to the economy or with policy in the short term, there will not be much movement in the general trend of prices. That way they do not begin to expect higher inflation and start raising prices or demanding higher wages in turn to offset the expected higher prices.

Stabilizing inflation expectations is important because prices and wages adjust relatively infrequently. The people and institutions in the economy usually set prices and wages over some horizon, and the level of these prices and wages would reflect their expectation of the evolution of inflation. If these economic “agents” know what the official inflation target is and the target is credible, they will expect the general price level to grow at the rate of the preannounced objective of the central bank. This expectation in itself then helps to deliver realized inflation close to the target.



In practice, inflation targeting is never “strict” inflation targeting but always “flexible” inflation targeting, in the sense that all inflation targeting central banks not only aim at stabilizing inflation around the inflation target but also put some weight on stabilizing the real economy, for instance, implicitly or explicitly stabilizing a measure of resource utilization such as the output gap between actual output and ‘potential’ output. Thus, the target variables of the central bank include not only inflation but other variables as well, such as the output gap.

So far, since its inception in the early 1990s, inflation targeting has been a considerable success, as measured by the stability of inflation and the stability of the real economy. There is no evidence that inflation targeting has been detrimental to growth, productivity, employment, or other measures of economic performance. The success is both absolute and relative to alternative monetary policy strategies, such as exchange rate targeting or money growth targeting. No country has so far abandoned inflation targeting after adopting it, or even expressed any regrets. For both industrial and non-industrial countries, inflation targeting has proved to be a most flexible and resilient monetary policy regime, and has succeeded in surviving a number of large shocks and disturbances. As of 2007, a long list of non-industrial countries were asking the International Monetary Fund for assistance in introducing inflation targeting. Although inflation targeting has been an unqualified success in all the small and medium sized industrial countries that have introduced it, the United States, the Eurozone and Japan have not yet adopted all the explicit characteristics of inflation targeting, but they are all moving in that direction. Reservations against inflation targeting have mainly suggested that it might give too much weight on inflation stabilization to the detriment of the stability of the real economy or other possible monetary-policy objectives; the fact that real-world inflation targeting is flexible rather than strict and the empirical success of inflation targeting in the countries where it has been implemented seem to confound those reservations. (Roger and Stone, 2005)

Table 2: Adoption of Inflation Targeting

Country	Effective IT adoption date	CPI inflation rate at start of disinflation	Disinflation period	CPI inflation rate at start of stable targeting	Stable IT period
New Zealand <sup>1</sup>	1990Q1	3.3	1990Q1-1992Q4	1.8	1993Q1-present
Canada <sup>1</sup>	1991M2	6.9	1991M2-1994M12	0.2	1995M1-present
United Kingdom <sup>1</sup>	1992M10			4.0	1992M10-present
Sweden <sup>1</sup>	1993M1			1.8	1993M1-present
Finland <sup>1</sup>	1993M2			2.6	1993M2-1998M12
Australia <sup>1</sup>	1993M4			2.0	1993Q2-present
Spain <sup>1</sup>	1995M1	4.2	1995M1-1997M12		1998M1-1998M12
Czech Republic <sup>1</sup>	1997M12	6.8	1997M12-2001M12	4.1	2002M1-present
Israel <sup>1</sup>	1997M6	8.1	1997M6-2002M12	6.5	2003M1-present
Poland <sup>2</sup>	1998M10	10.6	1998M10-2003M12	1.7	2004M1-present
Brazil <sup>2</sup>	1999M6	3.3	1999M6-2005M12	5.7	2006M1-present
Chile <sup>2</sup>	1999M9	3.2	1999M9-2000M12	4.5	2001M1-present
Colombia <sup>2</sup>	1999M9	9.3	1999M9-present		
South Africa <sup>2</sup>	2000M2			2.6	2000M2-present
Thailand <sup>2</sup>	2000M5			0.8	2000M5-present
Korea <sup>1</sup>	2001M1			2.8	2001M1-present
Mexico <sup>2</sup>	2001M1	9.0	2001M1-2002M12	5.7	2003M1-present
Iceland <sup>1</sup>	2001M3	4.1	2001M3-2003M12	2.7	2004M1-present
Norway <sup>1</sup>	2001M3			3.6	2001M3-present
Hungary <sup>1</sup>	2001M6	10.8	2001M6-2006M12	6.5	2007M1-present
Peru <sup>2</sup>	2002M1			-0.1	2002M1-present
Philippines <sup>2</sup>	2002M1	4.5	2002M1-present	1.8	
Guatemala <sup>2</sup>	2005M1	9.2	2005M1-present	0.2	
Slovakia <sup>1</sup>	2005M1	5.8	2005M1-2008M12		IT concluded in 2008M12
Indonesia <sup>2</sup>	2005M7	7.4	2005M7-present		
Romania <sup>2</sup>	2005M8	9.3	2005M8-present		
Turkey <sup>2</sup>	2006M1	7.7	2006M1-present		
Serbia <sup>2</sup>	2006M9	10.8	2006M9-present		
Ghana <sup>2</sup>	2007M5	10.5	2007M5-present		
All countries		5.7		3.1	
14 High income <sup>1</sup>		4.8		3.2	
15 Low income <sup>1</sup>		6.5		3.0	

Source: Author's calculations.

1/ High income countries, based on World Bank Development Indicators classification; 2/ Low income countries, based on World Bank Development Indicators classification.

Table Source: Scott Roger. October 2009. "Inflation Targeting at 20: Achievements and Challenges" *IMF Working Paper*, WP/09/236, pp.6

### 1.3 Key Elements of Inflation Targeting

Inflation targeting is a recent monetary policy strategy which includes some basic elements: 1) the public announcement of medium-term numerical targets for inflation 2) an institutional commitment to price stability as the primary goal of monetary policy, to which other goals are subordinated 3) an information inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments 4) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans, objectives, and decisions of the monetary authorities and 5) increased accountability of the central bank for attaining its inflation objectives.

As a monetary policy framework where public announcement of official inflation targets, or target ranges, IT is undertaken along with explicit acknowledgement that price stability, meaning low and stable inflation, is monetary policy's primary long-term objective. Price stability facilitates better planning by businesses and households preventing an arbitrary redistribution of wealth and income as a result of unexpected inflation or deflation. It also improves the transparency of the price mechanism, raising efficiency. Such a monetary policy framework, improves communication between the public, business and markets on the one hand, and policy-makers on the other hand, and provides discipline, accountability, transparency and flexibility in monetary policy. Typically, an inflation targeting central bank publishes a regular monetary policy report which includes the bank's forecast of inflation and other variables, a summary of its analysis behind the forecasts, and the motivation for its policy decisions. Some inflation targeting central banks also provide some information on, or even forecasts of, its likely future policy decisions.

Many banks in the past seem to have actively avoided accountability, for instance by not having explicit objectives and by being very secretive, inflation targeting is normally associated with a high degree of accountability. A high degree of accountability is now considered generic to inflation targeting and an important component in strengthening the incentives faced by inflation-targeting central banks to achieve their objectives. The explicit objectives and the transparency of monetary-policy reporting contribute to increased public scrutiny of monetary policy. In several countries inflation-targeting central banks are subject to more explicit accountability. In New Zealand, the Governor of the Reserve Bank of New Zealand is subject to a Policy Target Agreement, an explicit agreement between the Governor and the government on the Governor's responsibilities. In the UK, the Chancellor of the Exchequer's remit to the Bank of England instructs the Bank to write a public letter explaining any deviation from the target larger than one percentage point and what actions the

Bank is taking in response to the deviation. In several countries, central-bank officials are subject to public hearings in the Parliament where monetary policy is scrutinized; and in several countries, monetary policy is regularly or occasionally subject to extensive reviews by independent experts (for instance, New Zealand, the UK, Norway, and Sweden).

In addition, the focus of IT is on price stability, along with three objectives: credibility (the framework should command trust), flexibility (the framework should allow monetary policy to react optimally to unanticipated shocks), and legitimacy (the framework should attract public and parliamentary support). A commitment to price stability as the key operational objective of a central bank is by no means unique to inflation targeting. Rather it is a characteristic common to all monetary policy frameworks that may possibly be identified as broadly consistent with good policy practice. Avoiding both prolonged inflation and deflation, and safeguarding price stability, is now widely understood as contributing to high levels of economic activity and employment.

Inflation targeting central banks place particular emphasis on inflation forecasts and inflation expectations. A key element of the inflation targeting framework is a forward-looking policy orientation and the associated monitoring of inflation forecasts and inflation expectations. Central banks pursuing inflation targeting regularly publish extensive reports on economic conditions and the outlook for inflation, including their projections for these variables. Similarly, since the public's inflation expectations can provide valuable information about the outlook for inflation, their evolution receives special emphasis in any forward-looking policy approach. Monitoring short-term inflation expectations is valuable because expectations are important determinants of actual price and wage setting behavior and thus actual inflation over time. Expectations over longer horizons are particularly useful for gauging any possible reversal in the central bank's credibility regarding its commitment to price stability. They are also embedded in asset prices and long-term interest rates and thus, importantly, influence economic decisions with long-term outcomes such as investment in capital, housing and durable goods. Monitoring the stability of inflation expectations is also important to gauge the extent to which a central bank can accommodate real economic disturbances without compromising its price stability mandate. When private inflation expectations become unmoored from the central bank's objectives, macroeconomic stabilization can be considerably harder to achieve. Well-anchored inflation expectations facilitate the monetary policy response to adverse supply shocks, thereby enabling central banks to better stabilize economic fluctuations (Orphanides 2009).

In the design of monetary policy another key element under an inflation targeting regime is the horizon for achieving the inflation target. The horizon determines the monetary policy response to shocks. It is especially important for deriving an interest rate path consistent with the preferred

inflation path towards its target. A small but increasing number of central banks publicly announce such interest rate paths. Moreover, communication of the horizon is crucial for anchoring inflation expectations at the target in the medium run and the accountability of monetary policy authorities. Inflation targeting central banks tend to adopt short rather than long horizons, partly to avoid compromising their credibility as inflation targeters. Many inflation targeting central banks have either preannounced a fixed horizon of 1 or 2 years or a variable horizon of 1–3 years (Roger and Stone 2005). Some central banks including Norges Bank, however, refrain from quantifying the horizon and state that they will seek to bring inflation close to the target in the ‘medium run’, which is commonly understood to extend not too far into the future. The choice of a fixed relatively short horizon or range is often based on estimated time lags from interest rate changes to their main effects on inflation. The relevant literature, however, suggests that the horizon should also depend on the nature of shocks and their properties, particularly size and persistence. It also suggests that the horizon should depend on the extent to which the central bank pursues other policy objectives in addition to the inflation target (Svensson 1997). It is often argued that the optimal policy horizon becomes longer the greater the weight placed on secondary objectives like smoothing output and/or interest rate fluctuations in the authorities’ objective function (Svensson 1997). It follows that, due to differences in preferences for output stabilization, the optimal horizon in response to a shock may vary across economies even if they are exposed to the same shock.

Another element of inflation targeting is a transparent communication strategy which aims at explaining to the markets and the public at large the mandate of the central bank and its actions towards achieving this mandate over the medium term. The opacity which accompanied monetary policy in the past has been replaced by transparency. The merits of this transparency have been understood and incorporated into other strategies as well. Increased transparency in monetary policy has been espoused by both inflation and non-inflation targeting central banks over this period. Although an increase in transparency may not have been an integral part of the framework followed by non-inflation targeting central banks, its value was recognized, in part because of the early success of inflation targeting. As a result, today the public is in a better position to comprehend the rationale for policy decisions. A better educated public regarding the systematic component of monetary policy implies a smaller element of surprise and increased effectiveness of monetary policy actions (Orphanides 2009).

Having to account for inflation performance provides strong incentives for the central bank to focus on meeting its targets and to communicate its decisions and actions transparently. The need to explain policy decisions to the public also serves as a powerful internal discipline on the central bank’s approach to policy analysis and decision making. Public accountability also provides an

incentive for the central bank to resist external pressures to let factors outside its remit unduly influence policy. From this perspective, high standards of policy accountability help the central bank to maximize its autonomy to pursue its mandate, while minimizing its incentives to be distracted by other considerations.

Mechanisms for providing central bank policy accountability vary across countries, with some having quite formal arrangements and others less so (Table 3).

The main mechanisms used to hold the central bank accountable for its policy performance and actions include:

- Publication of regular inflation or monetary policy reports;
- Publication of special reports or open letters in the event of significant misses of the target;
- Use of “escape” clauses to limit central bank accountability in particular circumstances, as well as to indicate, in advance, how policy will react to certain kinds of shocks
- Parliamentary testimony by the central bank governor;
- Publication of minutes of policy meetings within a reasonable time frame; and
- Press conferences and analyst briefings following release of policy decisions and monetary policy reports.

Table 3: Central Bank Accountability and Policy Transparency

Country	Publication of Policy Minutes	Testimony / Reporting to Parliament	Monetary Policy Report	Specific Reporting on Large Target Misses 1/	Use of Escape Clauses 2/
Australia	No	Yes	Quarterly	No	No
Brazil	Yes, 8-day lag	Yes	Quarterly	Yes	No
Canada	No	Yes	Semi-annual + update	Yes	No
Chile	Yes, 90-day lag	Yes	3 per year	No	No
Colombia	No	Yes	Quarterly	No	No
Czech Republic	Yes	Yes	Quarterly	No	Explicit description
Ghana	No	No	4-6 per year	No	No
Guatemala	No	Yes	Semi-annual	No	No
Hungary	Yes	Yes	Semi-annual + update	No	No
Iceland	No	No	Quarterly	Yes	No
Indonesia	No	Yes	Quarterly	Yes	No
Israel	Yes	Yes	Semi-annual	Yes	
Korea	No	Yes	Semi-annual	No	No
Mexico	No	Yes	Quarterly	No	No
New Zealand	No	Yes	Quarterly	Yes	Explicit description
Norway	No	Yes	3 per year	No	No
Peru	No	No	3 per year	No	No
Philippines	Yes	Yes	Quarterly	Yes	Explicit description
Poland	No	Yes	Quarterly	No	Explicit description
Romania	No	No	Quarterly	No	Explicit description
Serbia	No	Yes	Quarterly	Yes	No
Slovakia	No	No	Quarterly	No	Explicit description
South Africa	No	No	Semi-annual	No	Explicit description
Sweden	Yes	Yes	3 per year	Yes	Explicit description
Thailand	No	No	Quarterly	Yes	No
Turkey	Yes	No	Quarterly	Yes	No
United Kingdom	Yes	Yes	Quarterly	Yes	No

Notes & Sources: 1/ Roger and Stone (2005), Table 3. 2/ Tuladhar (2005), Table 2.

Table Source: Scott Roger. October 2009. "Inflation Targeting at 20: Achievements and Challenges" *IMF Working Paper*, WP/09/236, pp.11

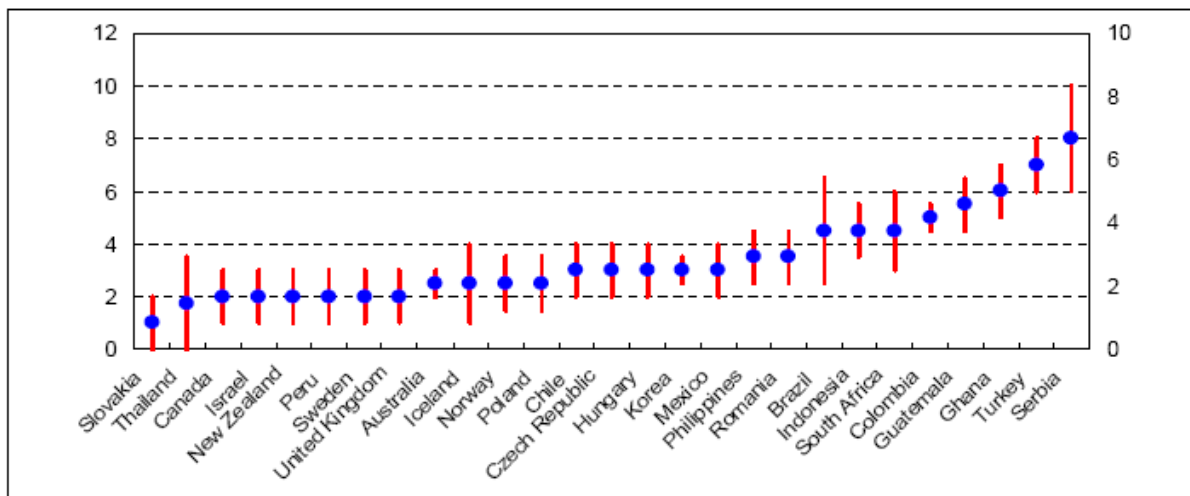
## 1.4 Inflation Targets

Specifications of inflation targets have become fairly standardized. In the early years of IT, there were considerable debates over the appropriate level and measure of inflation to target, whether to use point or range targets, the appropriate length of target horizons. Over time, however, target specifications appear to have converged on fairly standardized set up:

- In almost all IT countries, the target is specified in terms of the 12 month change in the headline CPI. This reflects the familiarity of the public with the headline CPI, the importance of the CPI in the formation of inflation expectations and wage determination, and the fact that it is calculated by the statistics agency, and is typically the best quality of the price measures available.
- Central banks also monitor and report on a range of measures of core inflation. Typically, these include exclusion-based measures (most commonly excluding exceptionally volatile prices, such as those for fresh fruit and vegetables, fuels, and non-market-determined or administered prices), and limited-influence measures such as trimmed means or the weighted median.
- Inflation target midpoints and ranges are similar for most countries (Figure 1). For countries that have adopted stable inflation targets, the midpoints of targets almost all lie between 2 to 3 percent. The target is usually specified as a point, with bands of plus or minus one percent. In a few countries, however, targets are defined as ranges, without specifying a center, while in others a point or “thick” point is specified without a range.
- Target horizons are also fairly standardized. During disinflation, targets are typically set for the end of year inflation rate, and set at least a year ahead. It is less common for the central bank to set out a full target path for disinflation, but several central banks indicate what the medium-term inflation objective is. Once disinflation has been accomplished, it is standard for countries to announce a shift from end-of year inflation targets to continuous or indefinite horizon targets.



Figure 1: Inflation Target Levels and Bands in 2008



Source: Author's calculations.

Figure Source: Scott Roger. October 2009. "Inflation Targeting at 20: Achievements and Challenges" *IMF Working Paper*, WP/09/236, pp.13

In a 2008 interview Adam Posen the coauthor (with current Federal Reserve Chairman Ben Bernake and Governor Frederic Mishkin) of the book "Inflation targeting as a monetary framework for central banks" was asked about the future of inflation targeting. In the question posed "What about choosing the inflation target itself? Why an inflation target of only 2 or 2.5 percent?" His answer as quoted is the following:

"That is a very legitimate question. It is something that central banks have been somewhat reluctant to discuss, because they are worried that if they talk about a higher inflation target than the current norm, their commitment to price stability will seem weaker, and inflation expectations will get out of hand. Most central banks have announced annual inflation targets of something like 2 percent for the consumer price index. The question is why so low, and you are right, the defense of that level is not self-evident. It essentially rests upon a slippery-slope argument rather than being an ideal level in and of itself.

The people who advocated setting an inflation target that low would argue that you really want inflation to be zero, because only relative price changes should affect economic decision making in the ideal world. There are two major drawbacks, however, to setting the measured inflation to zero in practice.

First, the cost in higher unemployment and lower output when you undershoot the target and get an inflation rate of less than zero— declining prices—is higher than the cost to the economy of

overshooting a bit above zero. Furthermore, it is more difficult to get out of deflation once there than to reduce inflation, so deflation persists more. Second, we also know that there are measurement problems in inflation data inherent to the design of any “basket” of goods and services because the quality of products changes over time. A slight rise in measured inflation is probably in actuality zero inflation. So advocates say to target 2 percent a year.

The underlying assumption in keeping the inflation target not just positive and stable but as low as 2 percent, however, is that if we let the target rise above 2 percent, people will not think the central bank is as serious about inflation as it should be. This is one of the areas where I have been moving a bit away from the received wisdom when we started talking about inflation targeting. If you look at the empirical growth economics research, there is a very robust set of results regarding what we think helps or hurts the rate of per capital economic growth (our best proxy for economic welfare at the macro level). Yet, despite the best efforts of some right-wing economists searching for evidence that higher inflation is costly, the research does not show that levels of inflation of 4, 5, or 6 percent a year, say, will hurt growth. It is just not there in the data.

I doubt there is any benefit for growth with a 6 percent annual inflation rate rather than a 2 percent rate, but any costs to growth from it do not show up in the research—that is, if you can keep inflation stable at that level, without unanchoring expectations and starting a wage-price spiral as in the 1970s” (Posen 2008)

## Chapter 2

### 2.1 Monetary Policy and Inflation

Inflation and monetary policy are closely related concepts wherein the latter can be used efficiently to reduce the effect of the former. Inflation is thought of as the rise in prices and wages that reduces the purchasing power of money. Monetary policy is the regulation adopted by the central bank, currency board or other regulatory authority which stabilizes the prices and maximizes production and employment of the country.

Monetary policy rests on the relationship between the rates of interest in an economy, that is the price at which money can be borrowed, and the total supply of money. Monetary policy uses a variety of tools to control one or both of these, to influence outcomes like economic growth, inflation, exchange rates with other currencies and unemployment. Within almost all modern nations, special institutions (such as the Federal Reserve System in the United States, the Bank of England, the European Central Bank, the People's Bank of China, and the Bank of Japan) exist which have the task of executing the monetary policy and often independently of the executive. In general, these institutions are called central banks and often have other responsibilities such as supervising the smooth operation of the financial system.

The Reserve Bank uses monetary policy in order to maintain price stability. Price stability occurs when goods and services, in general, aren't getting rapidly more expensive (inflation) or less expensive (deflation). At present price stability is defined as keeping inflation "on average over the medium term" between one and three percent in an agreement set out between the Minister of Finance and the Reserve Bank Governor, called the Policy Targets Agreement (PTA). The Reserve Bank also adjusts the Official Cash Rate in order to influence prices in the economy, and ensure price stability is maintained.

It is important for policymakers to make credible announcements. For example, to achieve low level of inflation, policymakers must have credible announcements; that is, private agents (consumers and firms) must believe that these announcements will reflect actual future policy. If an announcement about low level inflation targets is made but not believed by private agents, wage-setting will anticipate high level inflation and so wages will be higher and inflation will rise. A high wage will increase a consumer's demand (demand pull inflation) and a firm's costs (cost push

inflation), so inflation rises. Hence, if a policymaker's announcements regarding monetary policy are not credible, policy will not have the desired effect.

Announcements can be made credible in various ways. One is to establish an independent central bank with low inflation targets (but no output targets). Hence, private agents know that inflation will be low because it is set by an independent body. In addition, central banks can be given incentives to meet targets (for example, larger budgets, a wage bonus for the head of the bank) to increase their reputation and signal a strong commitment to a policy goal.

Reputation is an important element in monetary policy implementation. While a central bank might have a favorable reputation due to good performance in conducting monetary policy, the same central bank might not have chosen any particular form of commitment (such as targeting a certain range for inflation). Reputation plays a crucial role in determining how much markets would believe the announcement of a particular commitment to a policy goal but both concepts should not be assimilated. Also, under rational expectations, it is not necessary for the policymaker to have established its reputation through past policy actions; as an example, the reputation of the head of the central bank might be derived entirely from his or her ideology, professional background, public statements, etc.

The different types of monetary policy are also called monetary regimes. Under the policy approach we present in our thesis, inflation targeting, the target is to keep inflation under a particular definition such as Consumer Price Index, within a desired range. The inflation target is achieved through periodic adjustments to the central bank interest rate target. The interest rate target is maintained for a specific duration using open market operations. Typically the duration that the interest rate target is kept constant will vary between months and years. This interest rate target is usually reviewed on a monthly or quarterly basis by a policy committee and changes to the interest rate target are made in response to various market indicators in an attempt to forecast economic trends and in so doing keep the market on track towards achieving the defined inflation target. For example, one simple method of inflation targeting called the Taylor rule adjusts the interest rate in response to changes in the inflation rate and the output gap. The rule was proposed by John B. Taylor of Stanford University. As already noted, inflation targeting has been successful in countries which adopted it, because of its transparency and predictability to the markets.

## **2.2 The Rationale for Inflation Targeting**

The decision to organize a country's monetary strategy around the direct targeting of inflation rests upon a number of economic arguments about what monetary policy can and cannot do. Over the last twenty years, a consensus has been emerging in the economics profession that activist monetary policy to stimulate output and reduce unemployment beyond their sustainable levels leads to higher inflation but not to persistently lower unemployment or higher output. Thus, the commitment to price stability as the primary goal for monetary policy has been spreading throughout the world. Along with actual events, four intellectual developments have led the economics profession to this consensus.

### **Why Price Stability?**

The first intellectual development challenging the use of an activist monetary policy to stimulate output and reduce unemployment is the finding, most forcefully articulated by Milton Friedman, that the effects of monetary policy have long and variable lags. The uncertainty of the timing and the size of monetary policy effects makes it very possible that attempts to stabilize output fluctuations may not have the desired results. In fact, activist monetary policy can at times be counterproductive, pushing the economy further away from equilibrium, particularly when the stance of monetary policy is unclear to the public and even to policymakers. This lack of clarity makes it very difficult for policymakers to successfully design policy to reduce output and unemployment fluctuations.

The second development is the general acceptance of the view that there is no long-run trade-off between inflation and unemployment. The so-called Phillips curve relationship illustrates the empirical regularity that a lower unemployment rate or higher output can be achieved in the short run by expansionary policy that leads to higher inflation. As prices rise, households and businesses spend and produce more because they temporarily believe themselves to be better off as a result of higher nominal wages and profits, or because they perceive that demand in the economy is growing. In the long run, however, the rise in output or decline in unemployment cannot persist because of capacity constraints in the economy, while the rise in inflation can persist because it becomes embedded in price expectations. Thus, over the long run, attempts to exploit the short-run Phillips curve trade-off only result in higher inflation, but have no benefit for real economic activity.

The third intellectual development calling into question the use of an activist monetary policy to stimulate output and reduce unemployment is commonly referred to as the time-inconsistency problem of monetary policy. The time inconsistency problem stems from the view that wage- and price-setting behavior is influenced by expectations of future monetary policy. A frequent starting point for discussing policy decisions is to assume that private sector expectations are given at the time policy is made. With expectations fixed, policymakers know they can boost economic output (or lower unemployment) by pursuing monetary policy that is more expansionary than expected. As a result, policymakers who have a stronger interest in output than in inflation performance will try to produce monetary policy that is more expansionary than expected. However, because workers and firms make decisions about wages and prices on the basis of their expectations about policy, they will recognize the policymakers' incentive for expansionary monetary policy and so will raise their expectations of inflation. As a result, wages and prices will rise.

The outcome, in these time-inconsistency models, is that policymakers are actually unable to fool workers and firms, so that on average output will not be higher under such a strategy; unfortunately, however, inflation will be. The time-inconsistency problem suggests that a central bank actively pursuing output goals may end up with a bias to high inflation with no gains in output. Consequently, even though the central bank believes itself to be operating in an optimal manner, it ends up with a suboptimal outcome.

A fourth intellectual development challenging the use of an activist monetary policy to stimulate output and reduce unemployment unduly is the recognition that price stability promotes an economic system that functions more efficiently and so raises living standards. If price stability does not persist—that is, inflation occurs—the society suffers several economic costs. While these costs tend to be much larger in economies with high rates of inflation (usually defined to be inflation in excess of 30 percent a year), recent work shows that substantial costs arise even at low rates of inflation.

The cost that first received the attention of economists is the so-called shoe leather cost of inflation—the cost of economizing on the use of non-interest-bearing money. The history of prewar central Europe makes us all too familiar with the difficulties of requiring vast and ever-rising quantities of cash to conduct daily transactions. Given conventional estimates of the interest elasticity of money and the real interest rate when inflation is zero, this cost is quite low for inflation rates less than 10 percent, remaining below 0.10 percent of GDP. Only when inflation rises to above 100 percent do these costs become appreciable, climbing above 1 percent of GDP.

The four lines of argument outlined here lead the vast majority of central bankers and academic monetary economists to the view that price stability should be the primary long-term goal for monetary policy. Furthermore, to avoid the tendency to an inflationary bias produced by the time-inconsistency problem (or uncertainty about monetary policy goals more generally), monetary policy strategy often relies upon a nominal anchor to serve as a target that ties the central bank's hands so it cannot pursue (or be pressured into pursuing) a strategy of raising output with unexpectedly expansionary monetary policy.

An inflation target (or its variant, a price-level target) clearly provides a nominal anchor for the path of the price level, and, like a fixed exchange rate anchor, has the important advantage of being easily understood by the public. The resulting transparency increases the potential for promoting low inflation expectations, which helps to produce a desirable inflation outcome. Also, like a fixed exchange rate or a monetary targeting strategy, inflation targeting reduces the pressure on the monetary authorities to pursue short-run output gains that would lead to the time-inconsistency problem. An inflation-targeting strategy also avoids several of the problems arising from monetary targeting or fixed exchange rate strategies. For example, in contrast to a fixed exchange rate system, inflation targeting can preserve a country's independent monetary policy so that the monetary authorities can cope with domestic shocks and help insulate the domestic economy from foreign shocks. In addition, inflation targeting can avoid the problem presented by velocity shocks because it eliminates the need to focus on the link between a monetary aggregate and nominal income; instead, all relevant information may be brought to bear on forecasting inflation and choosing a policy response to achieve a desirable inflation outcome. However, IT does have some disadvantages which we will discuss in our next chapter in which we will mention some critiques of the IT model as well.

### 2.3 A Framework, Not a Rule

On “The Journal of Economic Perspective,” authors Ben S. Bernanke and Frederic S. Mishkin argue that it is most fruitful to think of inflation targeting not as a rule, but as a framework for monetary policy within which "constrained discretion" can be exercised. This framework has the potential to serve two important functions: improving communication between policymakers and the public, and providing increased discipline and accountability for monetary policy if inflation targeting is a framework and not a rule. If viewed as a framework rather than as a rule, inflation targeting can confer some important advantages. It provides a nominal anchor for policy and the economy. By communicating the central bank's objectives and views, it increases the transparency of monetary policy. It has the potential to provide increased discipline and accountability for policymakers. Importantly, it may be able to achieve all this without entirely giving up the benefits of discretionary policies in the short run.

The authors give different examples to show that the motivations for an inflation targeting approach have been varied from country to country. For example, in United Kingdom and Sweden, the collapse of an exchange rate peg led the monetary authorities to search for an alternative "nominal anchor" for monetary policy, a way of reassuring the public that monetary policy would remain disciplined. The demise of a fixed exchange rate regime similarly motivated the adoption of a money focused approach by Germany in the mid-1970s. Some countries came to inflation targeting after unsuccessful attempts to use a money targeting approach. For example, by 1980 inflation Canada's inflation was as high as it was in 1975 (10 percent per year) despite adherence to monetary targets that led to lower money growth rates. In other cases, countries with tight monetary policies had succeeded in reducing their core rate of inflation and adopted inflation targeting as an institutional means of locking in their inflation gains.

Developments in macroeconomic theory also played some role in the growing popularity of the inflation targeting approach. These familiar developments included reduced confidence in activist, countercyclical monetary policy; the wide spread acceptance of the view that there is no long-run tradeoff between output (or unemployment) and inflation, so that monetary policy affects only prices in the long run; theoretical arguments for the value of pre-commitment and credibility in monetary policy (Kydland and Prescott, 1977; Calvo, 1978; Barro and Gordon, 1983); and an increasing acceptance of the proposition that low inflation promotes long-run economic growth and efficiency.



Critics of inflation targeting as a rule might well ask what is gained by the loss of flexibility entailed by pre-committing monetary policy in this way. The academic literature on rules argues that tying the hands of policymakers will reduce the inflation bias of discretionary policy and perhaps allow for less costly disinflations, as increased credibility leads inflation expectations to moderate more quickly. However, critics of inflation targeting could point out that, although inflation targeting countries have generally achieved and maintained low rates of inflation, little evidence supports the view that these reduced rates of inflation have been obtained at a lower sacrifice of output and employment than disinflations pursued under alternative regimes (at least so far). Even the Deutsche Bundesbank and the Swiss National Bank, whose pursuit of low inflation over the last two decades has presumably given the maximum credibility, have been able to achieve inflation reductions only at high costs in lost output and employment (DeBelle and Fischer, 1994; Posen, 1995). Nor is there evidence that the introduction of inflation targets materially affects private-sector expectations of inflation, as revealed either by surveys or by the level of long-term nominal interest rates. Inflation expectations have come down, in most cases, only as inflation-targeting central banks have demonstrated that they can deliver low inflation (Posen and Laubach, 1996).

These objections are certainly important, as far as they go. However, again, they derive much of their force from the assumption that inflation targeting is to be viewed as an ironclad rule. Interpreting inflation targeting as a type of monetary policy rule is a fundamental mischaracterization of this approach as it is actually practiced by contemporary central banks.

This framework has the potential to serve two important functions: improving communication between policymakers and the public, and providing increased discipline and accountability for monetary policy. In terms of communication, the announcement of inflation targets clarifies the central bank's intentions for the markets and for the general public, reducing uncertainty about the future course of inflation. Arguably, many of the costs of inflation arise from its uncertainty or variability more than from its level. Uncertain inflation complicates long-term saving and investment decisions, exacerbates relative price volatility, and increases the riskiness of nominal financial and wage contracts. Uncertainty about central bank intentions may also induce volatility in financial market a common phenomenon in the United States, where stock market analysts parse every sentence uttered by the Fed chairman in search of hidden meanings. Inflation targets offer transparency of policy; they make explicit the central bank's policy intentions in a way that should improve private-sector planning, enhance the possibility of public debate about the direction of monetary policy, and increase central bank accountability. Transparency has been claimed as a positive feature of other policy strategies, such as money-growth targeting, but we doubt that

concepts like the growth rates of particular money aggregates are nearly so understandable to the general public as is the predicted rate of change of consumer prices.

To see the practical advantage of policy transparency, consider the familiar scenario in which an upcoming election or a slow economic recovery induces the government to pressure the central bank to apply some short-run stimulus. In an inflation targeting regime, the central bank would be able indeed, would be required to make explicit that the short-run benefits of this policy (faster real growth) may well be purchased at the price of medium- and long-term inflation. These projections could then be debated by politicians, press and public, but at least the issue of long-run inflation effects would be on the table, serving as an explicit counterweight to the short-run benefits of monetary expansion. Making the linkage of short-term policies and long-term consequences explicit would clarify for the public what monetary policy can and cannot do.

Furthermore, the idea that inflation targeting requires an accounting of the long-run implications of short-run "discretionary" actions is also central to the argument that inflation targeting helps to discipline monetary policy. In practice, exactly who needs disciplining may differ from country to country, depending on politics, institutional arrangements and personalities. In the macroeconomic literature on central bank credibility, it is the central bank that needs discipline, because it is assumed to desire an unemployment rate lower than the natural rate. This desire leads the monetary authority to try to "fool" the public with surprise inflation, inducing producers (who confuse nominal and real price increases) to increase output and employment above the natural rate. If the public has rational expectations, however, it will anticipate the central bank's actions, and producers will not be fooled, so that in equilibrium the economy will suffer higher-than-optimal inflation with no benefits in terms of lower unemployment.

If a story along these lines describes the actual situation in a given economy, then an inflation targeting framework will not directly prevent the counterproductive attempts of the central bank to engage in excessive short-run stimulus. In this respect, inflation targeting is inferior to an ironclad rule, if such could be implemented. However, in contrast to the purely discretionary situation with no explicit targets, under inflation targeting the central bank would be forced to calculate and to publicize the implications of its short-run actions for expected inflation in the long run (and again, these projections would be subject to scrutiny and debate). To the extent that the central bank governors dislike admitting publicly that they are off track with respect to their long-run inflation targets, the existence of this framework would provide an additional incentive for the central bank to limit its short-run opportunism.

Although the theoretical literature typically posits the central bank as the entity who chooses to inflate opportunistically, we suspect that in most cases the executive and legislative branches of the government have the greater incentive to engage in such behavior, often because of approaching elections. Central bankers, in contrast, tend to view themselves as defenders of the currency. This view may be the result of intentional appointments of "tough" central bankers (for reasons described by Rogoff, 1985), or it may just be that self-selection and socialization act to make central bankers relatively hawkish on inflation. But in either case, the existence of longer-term inflation targets can prove a useful device by which the central bank can protect itself politically from over-expansionist pressures. In particular, by making explicit the long-run, as well as the short-run, implications of over-expansionist policies, the central bank may be better able to get the support it needs to resist such policies.

## Chapter 3

### 3.1 Introduction of the Eurosystem and Inflation Targeting

On January 1<sup>st</sup> 1999, the Euro was launched, and the Eurosystem (the European Central Bank [ECB] and 11 national central banks in Europe) took responsibility for monetary policy in the Euro area.

During the 1990's an increasing number of central banks adopted inflation targeting, which due to its logical and transparent design and apparent success so far, it has become a focus of interest and a natural frame of reference. Inflation targeting is characterized by, first, an explicit numerical inflation target. The inflation target is pursued in the medium run, with due concern for avoiding real instability, for instance, in the output gap- that is, inflation targeting is "flexible" rather than "strict." Second, due to the unavoidable lags in the effects of instruments on inflation, the decision framework is in practice "inflation forecast targeting." Third, communication is very explicit and to the point- policy decisions are consistently motivated with reference to published inflation and output (-gap) forecasts. Indeed, inflation targeting has introduced unprecedented transparency and accountability in monetary policy. Three central banks (the Reserve Bank of New Zealand, the Bank of England, and Sweden's Sveriges Riksbank) stand out as particularly consistent and transparent in their implementation of inflation targeting.

#### **Goals**

The European Union Treaty, signed in Maastricht on February 7<sup>th</sup>, 1992 (the Treaty was effective on November 1, 1993) specified the basic characteristics of the Union, its Central Bank, national budgetary procedures within the Union; procedures governing the decision making processes in the Community institutions; criteria that the EU countries should meet in order to join the Economic Union, as well as the schedule of its formation. The European Union Council, at the summit in Copenhagen in 1993, specified the criteria for countries wanting to join the European Union. It was established that countries that have already been, or will be in the future associated with the EU, will be accepted to join the Union provided that they submit such an application and are able to satisfy the political and economic conditions of membership. One of these criteria is the obligation to participate in the formation of the Economic and Monetary Union. These countries are

obliged to conduct such budgetary and monetary policy that would satisfy the convergence criteria of Maastricht as regards deficit, public debt and inflation.

The Maastricht Treaty assigns price stability as the primary objective for the Eurosystem but leaves to the Eurosystem the formulation of an operational definition. In October 1998, the Eurosystem defined price stability as "a year-on-year increase in the Harmonised Index of Consumer Prices for the euro area of below 2%" (European Central Bank, 1998a). It has several times emphasized the medium-term orientation of its policy and that a gradualist and measured response to threats to price stability will not introduce "unnecessary and possibly self-sustaining uncertainty into short-term interest rates or the real economy " (European Central Bank, 1999). This emphasis on the medium term, gradualism, and stability of the real economy is consistent with "flexible" rather than "strict" inflation targeting.

However, as commentators quickly pointed out, the Eurosystems' definition of price stability was ambiguous, since it did not specify a lower bound for inflation. In November 1998, the ECB president, Willem Duisenberg (1998a), clarified that the word "increase" should be interpreted as excluding deflation. It would seem to follow that the lower bound was zero and that the definition refers to an inflation rate between 0 percent and 2 percent. However, two days later, Duisenberg (1998b) stated that "we did not announce a floor for inflation, because we know that the price index may include a measurement bias, but we do not know its magnitude."

If the lower bound is zero, it would seem logical to use the midpoint, 1 percent, as the point inflation target. However, when the reference value was announced in December 1998 (European Central Bank, 1998b), it appeared that a point inflation target of 1.5 percent had been used instead. To this date, the Eurosystem has not yet been explicit about the lower bound.

## **Decision Framework**

Although inflation targeting is technically difficult in practice, the principles of inflation targeting are relatively straightforward. Given that monetary policy actions affect inflation with a lag, efficient inflation targeting requires inflation forecast targeting. That is, the central bank needs to make conditional inflation forecasts (conditional on its view of the transmission mechanism, the current state of the economy, and a given planned path for its instrument rate). The bank then selects the instrument plan that results in an "optimal" inflation forecast, that is, an inflation forecast that approaches the inflation target at an appropriate pace without causing too much variability in the real economy or interest rates. The bank then starts implementing the instrument plan, by setting the

interest rate accordingly. At regular intervals, if new significant information has been collected, the procedure is repeated, and a new interest rate plan adopted and implemented. From this perspective, inflation forecast targeting is just an algorithm to solve an intertemporal optimization problem. With minor differences, this is the decision framework used by all inflation-targeting central banks. Thus, if the Eurosystem wants to meet its definition of price stability in the medium term, it must decide on an instrument plan such that the corresponding inflation forecast in the medium term, conditional on all relevant information and its instrument plan, falls between the undisclosed lower bound and the upper bound of 2 percent.

In October 1998, the Eurosystem announced that the monetary policy strategy would consist of "two key elements," later called "the two pillars": The first pillar is "a prominent role for money" set at 4.5 percent in December 1998 (European Central Bank, 1998b). Monetary targeting per se was rejected, however. Instead, money's role as an indicator of future inflation was emphasized: "Deviations of current monetary growth from the reference value would, under normal circumstances, signal risks to price stability." The reference value was reconsidered in December 1999 and maintained at 4.5 percent. The second pillar is a "broadly-based assessment of the outlook for price developments and the risks to price stability," where the assessment is made "using a wide range of economic and financial variables as indicators for future price developments."

## **Communication**

Inflation targeting central banks have expended considerable effort to explain past outcomes and to motivate current policy decisions, typically with reference to published conditional inflation forecasts. For instance, Sveriges Riksbank organizes its quarterly inflation report (see e.g., Sveriges Riksbank, 1999) according to its view of the transmission mechanism and the determination of inflation; it also systematically updates its estimates of the main determinants of inflation and summarizes the resulting adjustments in its conditional inflation forecast relative to that reported in the previous inflation report. The degree of uncertainty in the forecast is also updated and assessed in each report.

These practices of inflation targeting central banks allow outside observers to scrutinize the central banks' analysis and forecasts and then judge whether the policy decisions taken are appropriate, given the goals and available information. Several central banks also publish minutes from the monetary policy meetings, which allows outsiders further to assess whether the discussion and analysis are competent, whether the various arguments presented are appropriate, and whether final decisions are consistent with the goals. All together, this commitment to communicate

simplifies outside monitoring and evaluation of monetary policy, strengthens the accountability of the central banks, and provides stronger incentives for the banks to fulfill their announced goals. Compared to previous monetary policy regimes, inflation targeting has introduced an unprecedentedly high degree of transparency into monetary policy.

How does the Eurosystem compare? So far the Eurosystem has not published its most crucial information, the internal forecasts. Indeed, initially keeping the forecasts secret was considered a virtue (Duisenberg, 1998a): “publishing an inflation forecast would obscure rather than clarify what the Governing Council is actually doing. Because publishing a single inflation forecast would be likely to suggest that monetary policy reacts mechanistically to this forecast, publication might mislead the public and therefore run counter to the principle of clarity.” However, since September 1999, several public statements have indicated that forecasts will be published, and in December 1999, Duisenberg (1999) stated: “We, of course, also compare those (external) forecasts with our internal preliminary forecasts, which will ultimately be published in the course of next year.” The extended quarterly versions of the ECB's Monthly Bulletin of June, September, and December 1999 have started to report external forecasts. Duisenberg (1999) actually seems to reveal ECB's internal forecast: “the European Commission also forecasts average inflation in 2000 and 2001 to be 1.5%, and we see no reason to deviate from that forecast.” Duisenberg did not reveal whether this number should be interpreted as an unconditional forecast (conditional on optimal policy by the Eurosystem) or a conditional forecast (for instance, conditional on an unchanged interest rate). In the former case, it seems that 1.5 percent for 2001 should probably be interpreted as the Eurosystem's point inflation target (consistent with the inflation target used in the calculation of the M3 reference value). The Eurosystem does not publish minutes and voting records of the General Council meetings. Instead, it has argued that the introductory statement at the press conference held immediately after the meetings is similar to “summary minutes.” If that is the case, a comparison of the statements with the minutes of Bank of England and Sveriges Riksbank gives the unfortunate impression that the Eurosystem is considerably less advanced, systematic, and forward-looking than those banks. The two week delay in publishing the minutes from Bank of England is probably close to the minimal time necessary to summarize and edit sophisticated and detailed discussions and arguments. In any case, a press conference is certainly not a commitment to give an adequate report of the discussions at a meeting and, rather, an invitation to a somewhat selective presentation. The Eurosystem's reluctance to be more open and transparent, in particular, in publishing internal forecasts and minutes, has probably been quite costly from a public-relations perspective. The Eurosystem's repeated pronouncements about its high degree of transparency (e.g., Ignazio Angeloni and Otmar

Issing, 1999) have not carried far, since critics have the easy task of pointing to other central banks that are clearly more transparent.

To conclude, the first year of the Eurosystem was a successful launch of the Euro and an apparently successful introduction of the common monetary policy. The Eurosystem monetary strategy is quite similar to flexible inflation targeting, for instance, in having a quantitative definition of price stability, in the emphasis on the medium term, and in the concern to avoid real instability. However, there is considerable room for improvement with regard to internal consistency and transparency of the regime. The remaining asymmetry and ambiguity in the definition of price stability, although minor, does not serve any useful purpose. The insistence on the separate first pillar is an important source of ambiguity and inconsistency. The first pillar is redundant (as also indicated by the first year's experience). A rational role for monetary aggregates is to contribute to conditional forecasts, among other indicators and according to their predictive power, as for the inflation targeting central banks (and now apparently also the Swiss National Bank). There is considerable room for increased transparency about General Council meetings. The introductory statements at the press conference after the meetings are hardly enough, certainly not if the meetings become more sophisticated and are the genuine locus for decisions. It is difficult to see how the Eurosystem could lose from further increases in consistency and transparency. It is worth emphasizing that, since the ECB was created in 1998, it has made sincere efforts to maintain an open dialogue with academic researchers and external experts, including critics, as witnessed by an active visitors' program and its participation in and organization of a number of academic conferences.



### 3.2 Maastricht Criteria: suitable for new EU members?

Recent economic papers raise the issue and challenges faced by the new members on the road to the Euro. An argument that has been raised relates to the real convergence process and whether the Maastricht criteria of inflation and exchange rate stability laid down 15 years ago for a group of countries with less divergent levels of economic development can be reconciled with the lesser degree of real convergence of most of the new members. Or to put it differently, whether these criteria are such that they unavoidably will keep out of the monetary union countries which will have already reached a stage where they could function normally in the euro area and reap the benefits of membership. Critiques raise the question of modifying the Maastricht inflation criterion. They argue that the criterion as currently defined has lost its economic logic and suggest an approach that has a more justifiable economic logic and would somewhat increase the acceptable rate of inflation for admission into euro area. Thus, the impact on the inflation of the euro area as a whole would be minimal.

In order to adopt to the Euro, countries must satisfy the Maastricht criteria on inflation, interest rate, public debt, fiscal deficit and exchange rate stability. The inflation criterion states that the inflation rate of the country wishing to join the Euro area cannot exceed by more than 1.5 percentage point the average inflation of the three best performing EU Member States in terms of price stability. This criterion will prove hard to meet in the near term, especially for the Baltic countries which have fixed exchange rates. Countries might be tempted to resort to techniques - such as a freezing of administered prices, a reduction of consumption taxes or a tightening of credit growth by various short term expedients - to squeeze in under the reference value. This can turn out to be counter-productive if inflation accelerates after Euro adoption, due to the relaxation of credit conditions, the unavoidable upward adjustment of administered prices and/or because of a reversal of the reduction in consumption taxes for budgetary reasons. Such policy would not help the smooth path of convergence.

There are however few options available. One is to postpone Euro adoption until a greater degree of real and nominal convergence has been achieved. While this might be unavoidable for countries with the largest price level gaps and pegged exchange rate, it would deprive some others from the benefits of being a member of the monetary union. A way to ease entry into Euro area for countries which already have achieved the conditions permitting them to operate normally in the monetary union would be to change the criterion. It is understandable that the inflation criterion was originally defined in terms of the three best performers among the potential candidate countries at the

time when there did not yet exist a European monetary union. It was also natural that the principle of equal treatment was laid down since it would have been difficult to negotiate an agreement in any other way. Now that the Euro area exists, the criterion based on the three best performers including those which are not member of the Euro area is more difficult to justify on economic grounds. This is true even though it is the policy to exclude from the three best performers the countries where the low inflation level is due to special factors and is therefore judged as not sustainable (so far only countries with negative inflation have been excluded).

Another reasonable solution as they point out would be to define the criterion as the Euro area inflation plus 1.5 percentage points. The economic justification to use the Euro area inflation is that this is the relevant indicator that contributes to the imported inflation of the new members whose trade is essentially with the Euro area. Furthermore, this is the indicator that the ECB tries to control and it is not logical that the basis for the reference value for the new members should be different. The margin of 1.5 percentage points would constitute the room for accommodating the “equilibrium” forces of price level convergence. Such modification of the inflation criterion would free the decision makers from weighing which best performer country’s inflation is sustainable and which best performer’s is not, an exercise that is bound to be a source of friction. To discourage “weighing-in” practices, such modification of the reference value could be accompanied by increasing the period from one year to two years during which the inflation criterion has to be respected. It could be complemented with a stricter interpretation of the allowable exchange rate appreciation within this period, which also corresponds to the compulsory length of stay in ERMII. Such changes would also provide a better perspective for judging whether a candidate country can maintain the low level of inflation in a sustainable way when an exchange rate appreciation is no more available for moderating inflation.

## **Inflation Targeting - Floating Exchange Rates**

Some support the idea that inflation targeting with floating rates is better suited for the new EU inflation targeting countries than hard pegs. The possibility of letting the nominal exchange rate appreciate provides somewhat more flexibility to control inflation and accommodate price level convergence.

The inflation targeting regime with floating exchange rates provides more flexibility to deal with the inflationary pressures, as the risk premium can give some room for maneuver and there is the possibility of letting the nominal exchange rate appreciate. The flexibility should not be overestimated. The risk premium might be small due to Euro area entry anticipation driven capital

inflows and expectations of exchange rate appreciation. Furthermore, the tightness of domestic monetary policy can be circumvented by the foreign currency loan and the direct external borrowing channels as discussed earlier. Letting the exchange rate appreciate to fight inflation might in any case only give a temporary respite if the credit boom persists. Once within the Euro area, appreciation is not available any more raise its head again. It is therefore a complex question to decide which regime is best suited now to deal with the challenges on the road to the Euro. The lines are already pretty much drawn it seems, with some countries having opted for hard pegs, while others have chosen a flexible exchange rate arrangement under inflation targeting.

It follows from the above that inflation targeting with floating rates is better suited than hard pegs to manage the price level convergence for fast catching-up economies. This is because in pegged regimes, the price level convergence associated with the catching-up process translates into higher domestic inflation, which pushes the real interest rate into very low or negative territory, fuelling credit expansion and domestic demand and adding to the inflationary pressure. Under floating exchange rate regime, the real appreciation of the exchange rate inherent in the catching-up process can be accommodated by an appreciation of the nominal exchange rate rather than solely by higher inflation.

### **3.3 Objectives of European Central Bank (2010)**

As mentioned on the European Central Bank website ([www.ecb.int](http://www.ecb.int)), the primary objective of the ECB's monetary policy is to maintain price stability. The ECB aims at inflation rates of below, but close to, 2% over the medium term.

#### **Objective of monetary policy**

To maintain price stability is the primary objective of the Eurosystem and of the single monetary policy for which it is responsible. This is laid down in the Treaty on the Functioning of the European Union, Article 127 (1).

"Without prejudice to the objective of price stability", the Eurosystem will also "support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community". These include a "high level of employment" and "sustainable and non-inflationary growth".

The Treaty establishes a clear hierarchy of objectives for the Eurosystem. It assigns overriding importance to price stability. The Treaty makes clear that ensuring price stability is the most important contribution that monetary policy can make to achieve a favourable economic environment and a high level of employment.

These Treaty provisions reflect the broad consensus that

- the benefits of price stability are substantial. Maintaining stable prices on a sustained basis is a crucial pre-condition for increasing economic welfare and the growth potential of an economy.
- the natural role of monetary policy in the economy is to maintain price stability. Monetary policy can affect real activity only in the shorter term. But ultimately it can only influence the price level in the economy.

The Treaty provisions also imply that, in the actual implementation of monetary policy decisions aimed at maintaining price stability, the Eurosystem should also take into account the broader economic goals of the Community. In particular, given that monetary policy can affect real activity in the shorter term, the ECB typically should avoid generating excessive fluctuations in output and employment if this is in line with the pursuit of its primary objective.

## Benefits of price stability

The objective of price stability refers to the general level of prices in the economy. It implies avoiding both prolonged inflation and deflation. Price stability contributes to achieving high levels of economic activity and employment by

- improving the transparency of the price mechanism. Under price stability people can recognise changes in relative prices (i.e. prices between different goods), without being confused by changes in the overall price level. This allows them to make well-informed consumption and investment decisions and to allocate resources more efficiently;
- reducing inflation risk premia in interest rates (i.e. compensation creditors ask for the risks associated with holding nominal assets). This reduces real interest rates and increases incentives to invest;
- avoiding unproductive activities to hedge against the negative impact of inflation or deflation;
- reducing distortions of inflation or deflation, which can exacerbate the distortionary impact on economic behaviour of tax and social security systems;
- preventing an arbitrary redistribution of wealth and income as a result of unexpected inflation or deflation.

While the Treaty clearly establishes the maintenance of price stability as the primary objective of the ECB, it does not give a precise definition of what is meant by price stability.

## Scope of monetary policy

The central bank is the sole issuer of banknotes and bank reserves. That means it is the monopoly supplier of the monetary base. By virtue of this monopoly, it can set the conditions at which banks borrow from the central bank. Therefore it can also influence the conditions at which banks trade with each other in the money market.

In the short run, a change in money market interest rates induced by the central bank sets in motion a number of mechanisms and actions by economic agents. Ultimately the change will influence developments in economic variables such as output or prices. This process – also known as the monetary policy transmission mechanism – is highly complex. While its broad features are understood, there is no consensus on its detailed functioning.

## Inflation in the Euro Area

Inflation refers to a general increase in consumer prices and is measured by an index which has been harmonised across all EU Member States: Harmonised Index of Consumer Prices (HICP). The HICP is the measure of inflation which the Governing Council uses to define and assess price stability in the Euro area as a whole in quantitative terms.

The first four years of the EMU can be described as a period of low and stable inflation. Despite a fairly smooth path, price changes have been persistently above the threshold value of 2%, being however still consistent with a quantitative definition of price stability over the medium-term.

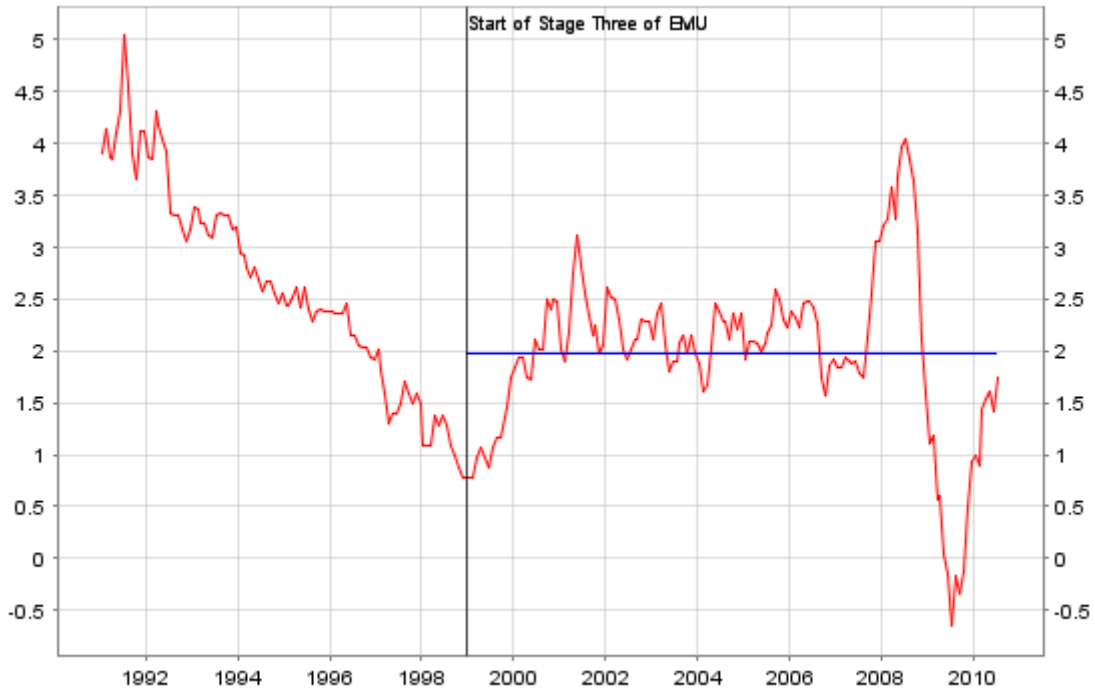
In the introductory statement to the ECB press conference on 8 April 1999, Willem Duisenberg makes the argument clear by stating “the present situation and the prospects for the increase in the rate of inflation are such that they seem, for as far as we can look forward, also to remain well below that ceiling of 2%. So, inflation is not a danger, which enabled us to pay more attention to the second area of objectives of the European Central Bank - that is to support the general economic policies of the European Community.” Such a concern reemerges in another introductory statement on 8 November 2001 when he reasons “the maintenance of price stability remains our first priority. [...] today’s (cut of 50 point basis) could be taken “without prejudice to price stability,” and it thereby supported the other goals of EMU, such as economic growth.”

Before the Euro became common currency, each country measured inflation using its own national methods and procedures. The introduction of the Euro made it necessary to have a means of measuring inflation for the entire Euro area, without gaps or overlaps and in a way comparable across countries. The HICP, supported by a set of legally binding standards, does precisely this.

The inflation rate in Euro Area was last reported at 1.80 percent in September of 2010. From 1991 until 2010, the average inflation rate in Euro Area was 2.24 percent reaching an historical high of 5.00 percent in July of 1991 and a record low of -0.70 percent in July of 2009.

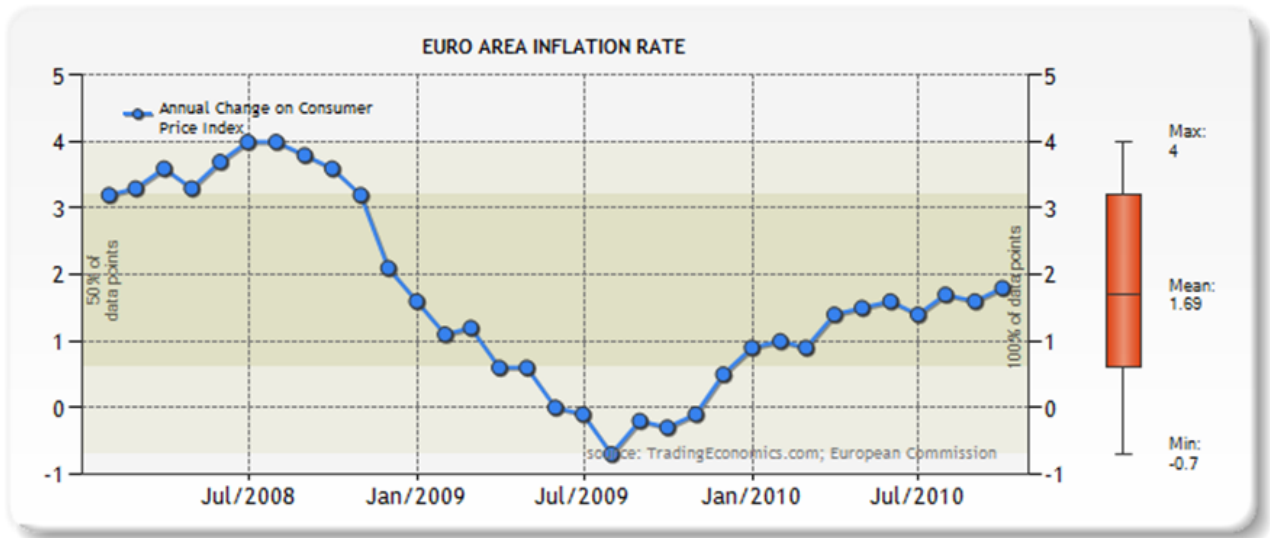
Figure 2: Inflation in the Euro area (annual percentage changes, non-seasonally adjusted) HICP

Average inflation since 1999



Source: Eurostat. Data prior to 1996 are estimated on the basis of non-harmonised national Consumer Price Indices (CPIs).

<http://www.ecb.int/mopo/html/index.en.html>



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	1.00	0.90	1.40	1.50	1.60	1.40	1.70	1.60	1.80			
2009	1.10	1.20	0.60	0.60	0.00	-0.10	-0.70	-0.20	-0.30	-0.10	0.50	0.90
2008	3.20	3.30	3.60	3.30	3.70	4.00	4.00	3.80	3.60	3.20	2.10	1.60

\* The table above displays the monthly average.

Source: TradingEconomics.com

## Chapter 4

### 4.1 Central Banks Incentives

In standard models of monetary policy in which dynamic inconsistency plays a prominent role, announcements from the central bank about its policy intentions are not believable; the central bank has an incentive to lie. Yet central banks often do make announcements, and they are legally required to do so in some cases. The Bank of England, for example, must issue periodic inflation reports. Similarly, the Reserve Bank of New Zealand is required under the Reserve Bank Act of 1989 to publish policy statements that spell out its plans; the January 1994 legislation governing the Banque de France requires its governor to appear before Parliament; and the European Central Bank must, under the Maastricht Treaty, report at least annually to the European Parliament. If public statements about policy intentions are not credible, the question naturally arises as to why central banks are frequently required to make them.

The answer, of course, is that announcements do provide the public with some information. Given the growing interest in policy transparency, particularly among those central banks that have adopted some form of inflation targeting, it is perhaps surprising that there has been relatively little explicit analysis of how inflation targeting requirements might combine with reporting requirements to influence the informational content of announcements, the conduct of stabilization policies and the central bank's credibility.

Inflation targeting has seen increased popularity in recent years, but a fixed target for inflation is generally suboptimal in the face of supply shocks, while state contingent targets are viewed as not feasible. Allowing the central bank to announce its own inflation target can produce an optimal policy response to new information even though the announcement does not fully reveal the central bank's private information. Announcements by the central bank have the potential to influence private sector expectations, and this does seem to be recognized by central banks. This introduces a strategic aspect to the central bank's decisions about what to announce, but the ability of a central bank to convey credibly its private information about the economy may be limited by the public's uncertainty about the central bank's true policy objectives.

Even though the central bank will not truthfully reveal its private information, the announcement leads to an optimal response to private information and reduces the average inflation



bias relative to targeting without announcements. Announcements also affect credibility, although the way they do so depends on the exact definition of credibility that is employed.

## 4.2 Critiques of Inflation Targeting Model

Some economists and a variety of literature, criticize the inflation targeting model. We present some potential disadvantages and critiques regarding inflation targeting.

One potential disadvantage of inflation target is that because of the uncertain effects of monetary policy on inflation, monetary authorities cannot easily control inflation. Thus, it is far harder for policymakers to hit an inflation target with precision than it is for them to fix the exchange rate or achieve a monetary aggregate target. Furthermore, because lags of the effect of monetary policy on inflation are very long, typical estimates are in excess of two years in industrialized countries, much time must pass before a country can evaluate the success of monetary policy in achieving its inflation target. This problem does not arise with either a fixed exchange rate regime or a monetary aggregate target.

Another disadvantage is that it may be taken literally as a rule that precludes any concern with output stabilization. An inflation target, if rigidly interpreted, might lead to greater output variability, although it could lead to tighter control over the inflation rate. For example, a negative supply shock that raises the inflation rate and lowers output would induce a tightening of monetary policy to achieve a rigidly enforced inflation target. The result however, would add insult to injury because output would decline even further. By contrast, in the absence of velocity shocks, a monetary aggregate target is equivalent to a target for nominal income growth, which is the sum of real output growth and inflation. Because negative supply shock reduces real output as well as raises the price level, its effect on nominal income growth would be less than on inflation, thus requiring less tightening of monetary policy.

The potential disadvantage of an inflation targeting regime that ignores output stabilization has led some economists to advocate the use of nominal income growth instead. A nominal income growth target shares many characteristics with an inflation target; it also has many of the same advantages and disadvantages. On the positive side, it avoids the problems of velocity shocks and the time inconsistency problem and allows a country to maintain an independent monetary policy. On the negative side, nominal income is not easily controllable by monetary authorities, and much time pass before assessment of monetary policy's success in achieving the nominal income target is possible. Still, a nominal growth target is advantageous in that it explicitly includes some weight on real output objective and thus may lead to smaller fluctuations in real output.

The debate over IT exposes a couple of odd characteristics. One is that despite a lot of effort, empirical studies on IT have consistently failed to show convincingly that IT has been an important factor in speeding up disinflation, achieving lower inflation rates, lowering the cost of disinflation, or raising the credibility of the central bank's commitment to low inflation. An important challenge for IT supporters comes from the observation that the environment of the 1990s, when IT was tried out, was generally benign, implying that the particular strategy of IT may have done little to improve monetary policy outcomes over what any reasonable strategy could have achieved.

The other oddity is that despite the lack of empirical evidence supporting the advantages of IT, its proponents consistently argue that the failure to adopt it jeopardizes the ability of a central bank to deliver price stability. For example, Bernanke et al, after presenting pages upon pages of rather inconclusive evidence regarding the superiority of IT, nevertheless submit a plea for the Fed to adopt IT in the end, arguing that this is critical to secure price stability in the US in the post-Greenspan era.

As we already mentioned throughout the thesis, the monetary policy of inflation targeting is understood to include: a numerical and official inflation target; monetary policy exercised through interest rates; an independent central bank; and no other objectives of monetary policy. A key feature of inflation targeting is the reliance on central bank credibility to elicit the required private sector response to official policy. Some critiques suggests that a nominal anchor will not stabilize output due to the asymmetric effects of interest rates (which act on asset stocks rather than expenditure flows) and that an active fiscal policy should be combined with an active monetary policy, rather than relying upon a single rule-bound instrument. Further, transparency may not have the strong effect on expectations that the inflation targeting assumes it does, while the cost-side of inflation is ignored.

There is also the structuralist critique of the negative effect of inflation targeting on capacity utilization and trade competitiveness leading to the argument for counter-cyclical monetary policy in response to external shocks. Moreover, "These external shocks are essentially asymmetric, in the sense that emerging markets are 'cycle takers' rather than 'cycle makers' and they are exacerbated by inherited debt positions. Exchange rates are subject to two conflicting demands: first, the stability of trade, prices and capital flows; and second, the flexibility required in order to adjust current and capital accounts to exogenous changes. Hard pegs serve to anchor the price level but lead to real exchange rate problems and eventually speculative crises. Floating rates lead to instability in domestic prices and expenditure that undermines investment and growth.

Another related critical argument is that IT is an insufficient guide for monetary policy in view of balance-sheets disorders (Palley, 2003). These imbalances are more likely to occur in today's environment of deregulated financial markets, essentially due to their ability to innovate. The imbalances thereby created are not expected to have immediate effects on inflation, but can have significant employment and output costs. These disorders are asset price and debt bubbles, which IT cannot cure. The implication being that additional policy measures are required; IT by itself cannot achieve the objectives assigned to it. Furthermore, IT can create moral hazard in asset markets. Monetary authorities pay little attention during the upturn, but are compelled to protect asset values during the downturn. This reinforces the argument about asset price bubbles to which we have just referred.

Another important critique is that of the practice of undertaking monetary policy within the IT framework by committees. This critique has been taken up by Blinder (1998) who argues that committees "laboriously aggregate individual preferences ... need to be led ... tend to adopt compromise positions on difficult questions ... tend to be inertial" (p 20). Committee inertial behavior, in particular, may induce the awkward problem of "inducing the central bank to maintain its policy stance too long" thereby causing central banks "to overstay their stance" (Blinder op. cit., p. 20). This problem may be alleviated whenever there is a strong and powerful chairman of the monetary policy committee, but even then "a chairman who needs to build consensus may have to move more slowly than if he were acting alone" (Blinder, p 21).

## Conclusion

We've seen the positive perspective of inflation targeting and the fact that IT was (or for some still is) viewed as the best framework for the central regime issue on how to organize monetary policy. It contributed to improved policy practice over the past years. With the success of this framework however, new challenges have appeared and studies which show little to no difference for IT and non-IT countries when it comes in maintaining low inflation. Some argue that IT has been a great deal of fuss about really very little.

FAWELZFWMO

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