IS INFLATION TARGETING AN APPROPRIATE FRAMEWORK FOR MONETARY POLICY? EXPERIENCE FROM THE INFLATION-TARGETING COUNTRIES

by

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DECLARATION AND COPYRIGHT

I, the undersigned, hereby declare that this dissertation is my own original work and that it has not been presented at any other university for a similar or any other degree awarded.

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Signature: K.P. Maumela

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ABSTRACT

The overall purpose of this study is to determine the appropriateness of inflation targeting as a monetary-policy framework. This study evaluates inflation-targeting experiences of industrialised and emerging-market economies. It also compares the economic performance of the inflation-targeting countries under inflation targeting with other monetary-policy frameworks. The appropriateness of inflation targeting in monetary policy is evaluated along the following dimensions, namely inflation reduction; target achievement; improving economic growth; and lowering interest and unemployment rates.

To satisfactorily achieve this objective, a number of issues are investigated. These issues include what inflation targeting entails and the evaluation of the theoretical basis thereof; the case for and against an inflation-targeting framework; monetary-policy alternatives to the inflation-targeting framework; and examining international experience regarding an inflation-targeting framework.

This study indicates that inflation targeting is an appropriate framework for monetary policy, particularly when there is a dire need for reducing high and volatile inflation. Many of the countries studied proved that inflation targeting had made a positive difference to their economies. These countries show an improved inflation performance, accompanied by improvements in both economic growth and employment performances after the introduction of inflation targeting. Moreover, inflation expectations, output volatility, inflation persistence, the impact of prices, and output shocks on inflation, as well as output sacrifice ratios, were reduced. As a result of the improved economic performance of inflation-targeting countries, other

countries are optimistic about inflation targeting as a monetary-policy framework. South Africa is also following this trend.

The international literature review of the topic offers lessons to be learnt from the common experience of the countries considered. It shows that inflation targeting is not a universal remedy to modern economic ills -- there is an emerging danger of assigning monetary policy a larger role than that which it can perform; a danger of expecting monetary policy to accomplish tasks that it cannot achieve; and a danger of preventing monetary policy from making the contribution that it is capable of doing. Therefore, inflation targeting cannot address all the macroeconomic problems that face many countries, except for inflation. Nonetheless, it plays a crucial role in improving macroeconomic performance.

Key terms:

Monetary-policy frameworks; inflation targeting; price stability; inflation rates; emerging-market economies; industrialised countries; interest rates; economic growth.

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LIST OF ACRONYMS AND ABBREVIATIONS

BCRP   Central Reserve Bank of Peru

BIS   Bank for International Settlements

BOE   Bank of England

BOG   Bank of Ghana

BoI   Bank of Israel

BOJ   Bank of Japan

BOT   Bank of Thailand

BSP   Bangko Sentral ng Philipinas

CBT   Central Bank of Turkey

CNB   Czech National Bank

CPI   Consumer Price Index

CPIX   Consumer Price Index (CPI) excluding interest rate on

            mortgage bonds *

GDP   Gross Domestic Product

GNP   Gross National Product

ECB   European Central Bank

EMS   European Monetary System

EMU   European Monetary Union

ERM   Exchange Rate Mechanism

EU   European Union

HCPI   Headline Consumer Price Index

IFS   International Financial Statistics

ILO   International Labour Organisation

IT   inflation targeting

ITL   Inflation targeting Lite

IMF   International Monetary Fund

MAD	Mean absolute deviation
MPC	Monetary Policy Committee
MTBPS	Medium Term Budget Policy Statement
NBP	National Bank of Poland
NBR	National Bank of Romania
NBS	National Bank of Serbia
NSS	New Neoclassical Synthesis
OECD	Organisation for Economic Co-operation and Development
RBA	Reserve Bank of Australia
RBNZ	Reserve Bank of New Zealand
SARB	South African Reserve Bank
SNB	Swiss National Bank
STATSSA	Statistics South Africa
TA	Technical assistance
UK	The United Kingdom
USA	The United States of America
WEI	World Economic Indicators
WEO	World Economic Outlook Database

* The CPIX used to be the South African inflation-targeting measure before being replaced by the Headline Consumer Price Index (HCPI) in 2009.

CHAPTER ONE

INTRODUCTION

1.1   BACKGROUND OF THE STUDY

In the past, central banks around the world pursued a number of policy goals. However, after recognising that even if they want to pursue several objectives such as economic growth; full employment; price stability and balance of payments stability, the range of targets that they can actually reach is very narrow, central banks nowadays attempt to understand the purpose of monetary policy and its goals. Hence, there is a consensus that maintaining price stability should be the primary objective of monetary policy. Based on this consensus, price stability became a popular goal of monetary policy for many central banks during the past couple of decades and it is expected to contribute indirectly to other monetary policy goals such as economic growth, full employment, exchange rate stability and even some distributional objectives such as income distribution goal. This has been the case for about 25 central banks across the globe and many countries were warming to the idea of inflation targeting before the emergence of two most hotly debated monetary policy issues, namely the choice of monetary-policy framework and assigning such monetary-policy framework proper goals. Recent global financial and economic crisis in 2008 and 2009 reinforced these debates. These debates have certainly changed the way the public think about monetary policy and taught central banks how far less the public know about monetary policy, and how the economy operates. Moreover, these debates are complicated by politician who claims to represent the society as a whole. Politicians exert considerable influence on economic policy by putting pressure on the central bank to consider goals that are beyond monetary policy. This is because governments in democracies are accountable to the electorate and as

such are justified in feeling they have the right to exert some influence over monetary policy. The monetary-policy framework of inflation targeting was not left unscathed by these developments with its practice increasingly being questioned and challenging this framework as a possible choice for monetary-policy framework. Politicians, together with policy-and non-policy-makers, raised an array of proposals such as, among others, the abandonment of the inflation-targeting framework, upward adjustment of inflation targets and moving to an alternative monetary-policy framework to inflation targeting.

Moreover, the quandary regarding monetary policy and proper policy goals rekindles an old robust debate about what the central bank can and cannot achieve through monetary policy, suggesting that this open question is still much alive. The thrust of the current debate is whether inflation targeting is an appropriate framework for monetary policy, revived by the current test to inflation targets posed by external shocks emanating largely from food and energy prices. However, to date no country that has adopted the inflation-targeting framework has abandoned it notwithstanding the fact that the jury is still out as to whether or not inflation targeting has passed the test of sustainability in the face of persistent shocks.

1.2   OBJECTIVES AND SIGNIFICANCE OF THE STUDY

1.2.1 Objectives of the study

The primary objectives of this study are to:

   i.   determine whether inflation targeting is an appropriate framework for monetary policy;
   ii.   investigate whether there are reasonable alternatives to inflation targeting; and to

iii.   contribute towards a better understanding of different monetary-policy frameworks with more emphasis on the inflation-targeting framework.

1.2.2 Significance of the study

Inflation targeting remains a central topic of monetary policy and an area of monetary policy surrounded by much uncertainty. To date, however, the performance of inflation-targeting countries has perhaps not been adequately studied, leading to an ongoing debate on whether inflation targeting is an appropriate framework for monetary policy or not. This study attempts to address these issues. However, in so doing, the author has taken a different approach to the approach taken by other inflation targeting authors by studying the performance of each inflation-targeting country, and ranking them according to their performances of achieving the set targets. So far, studies in this area are still very rare. Much of the available literature on inflation targeting concentrates either on selected inflation-targeting countries as a group, using their level of economic development or their regions as criteria for their studies. Moreover, most of the literature on inflation targeting provides the case for and against the inflation-targeting framework, yet the same is rarely applied to alternative monetary-policy frameworks. This practice makes it difficult to compare the inflation-targeting framework with other monetary-policy alternatives and to assess whether there are reasonable alternatives to inflation targeting. This study, however, provides the strength and drawbacks of other monetary-policy frameworks that will assist in shaping the monetary-policy debate, helps readers to evaluate alternative monetary-policy frameworks and further helps them understand what a monetary policy can and cannot achieve. Moreover, this approach educates the public about different monetary-policy frameworks and sheds some light on the popularity of certain monetary-policy frameworks. Perhaps the timing of this study also provides an opportunity to contribute to the current inflation-targeting debate that

has cast some doubt on the appropriateness of inflation targeting as a monetary-policy framework. The study may possibly convince some of its readers or the public at large of the significance of a lower inflation rate and an appropriate way to achieve it. Moreover, it will also contribute to the current inflation-targeting debate by showing that many misunderstandings about the inflation-targeting framework do not hold true, and that the inflation-targeting framework is more likely to pass the test of time or to prove to be a durable monetary-policy framework to withstand economic shocks despite being a relative 'newcomer' among monetary-policy frameworks.

1.3   Organisation of the study

This study has been divided into six chapters. The first chapter introduces the discussion on inflation targeting, and establishes the rationale for embarking on this study. Chapter Two gives a brief overview of the inflation-targeting framework and attempts to deal with the issues relating to the definition of inflation targeting, the nature thereof, and the importance of combating inflation under the inflation-targeting framework. A short section is dedicated to the Taylor Rule, based on its similarity to the inflation-targeting framework in terms of interest-rate recommendations. In Chapter Three, this study then explores or scrutinises the case for and against the inflation-targeting framework. This is addressed by analysing what proponents and critics of the inflation-targeting framework are saying, and provides counter-arguments to the critique of inflation targeting.

While inflation targeting is one way to achieve price stability, it is not the only way. Chapter Four of this study investigates whether there are reasonable alternatives to inflation targeting in a world where there is increasing international integration, both through trading in goods and through financial capital flows, with ever-growing financial innovation. This will be achieved by examining alternatives to the inflation-

targeting framework, and by highlighting some of their advantages and disadvantages. Chapter Five inspects the experience of countries that employ an inflation-targeting framework in an attempt to answer an ongoing debate on whether inflation targeting matters, with particular reference to the comparative macroeconomic performance in inflation-targeting countries. Chapter Six concludes by presenting a summary of findings; derives policy implications from the research done; and provides some recommendations for the future or on the topic.

CHAPTER TWO

OVERVIEW OF THE INFLATION-TARGETING FRAMEWORK

2.1   INTRODUCTION

Apart from Chapter One that introduces this study, Chapter Two gives a brief overview of the inflation-targeting framework and is organised as follows: Section 2.2 provides the definition of the inflation-targeting framework; Section 2.3 discusses the nature of inflation targeting; Section 2.4 answers the question as to why combating inflation is essential under inflation targeting; Section 2.5 attempts to provide answers as to whether inflation targeting is a one-size-fits-all approach; Section 2.6 presents inflation-targeting preconditions; Section 2.7 discusses the Taylor Rule; and Section 2.8 provides a summary of the chapter.

2.2   THE DEFINITION OF INFLATION TARGETING

An inflation-targeting framework is not that simple to define as it may seem. This is because the inflation-targeting framework in use has been polished considerably over time (Amato & Gerlach 2002:782). Moreover, monetary policy within what is generally referred to as the 'inflation-targeting countries' has diverse characteristics, many of them common to this group, but others practised by many countries generally not considered as inflation targeters. Moreover, the definitions of inflation targeting often differ in the existing discussions. Hence, it is difficult to establish a common view on the precise definition of inflation targeting when looking at the broad range of literature (Bernanke 2003c; Freedman & Laxton 2009b). Different authors propose different definitions (Walsh 2003; Svensson 1999b; Truman 2003). The differences in defining the inflation-targeting framework can be attributed to the fact

that this framework has typically been considerably refined over time. This may perhaps suggest that the definitions of inflation targeting have evolved, as well. However, when closely examining various definitions, one cannot ignore the fact that they mostly have something in common (Bernanke *et al.* 1999a; Bernanke & Mishkin 1997). Nevertheless, certain definitions contradict one another in some cases (Issing 2004). The two definitions provided by Amato and Gerlach (2002:782), and Svensson (2002:772) are good examples in this case. These authors define inflation targeting by emphasising criteria used to distinguish inflation targeting from other monetary-policy strategies. In their definition of inflation targeting, Amato and Gerlach (2002:782) regard price stability as the overriding goal of monetary policy. In his definition of inflation targeting, Svensson (2002:772) explicitly acknowledges that while achieving the inflation target is the primary objective of monetary policy, there is room for additional secondary objectives. Moreover, no serious definition of inflation targeting defines it in terms of specific description of how actual policy is implemented (Walsh 2009). This is because inflation-targeting countries also learn by practising the inflation-targeting framework. As a result, the definition of the inflation-targeting framework will also change as it attempts to capture these developments.

Moreover, classifying countries as being inflation targeters or not, is not definitive and misses most of the complexities of actual policy (Ortiz & Sturzenegger 2007). Complexities such as the absence of other nominal anchor required before a country becomes a full-fledged inflation targeting exist because inflation targeting is not a standard and there is no international organisation or central bank that neither governs nor enforce the inflation-targeting practice. As a result, such complexities are often violated. Therefore, the distinction between countries that are inflation targeters and those who are not has, in some instances, become so blurred at times that Mervyn King argued that "… any coherent policy reaction found can be described as inflation targeting" (King 1997). Consequently, many authors also offer differing

classifications. To a large extent, classification is based on a simple rule, that is, if a country states that it is an inflation targeter, it is classified as being one of the inflation-targeting countries. As a result of this practice, the rule that possible inflation targeters should meet certain criteria or conditions before adopting the inflation-targeting framework is often violated, which suggests that some slippages in any definition are unavoidable. However, for the purpose of this study, the discussion will be restricted to the full-fledged type of the inflation-targeting framework. The 25 countries included in this study do practice some form of inflation targeting, and one can benefit from studying how they practice it. However, the question remains: how is inflation targeting defined?

Lim (2009:110) and Svensson (1999b) both provide various but broadly similar and overlapping definitions of inflation targeting. Bernanke and Mishkin (1997:3), and Bernanke *et al.* (1999a:4) present a standard definition that will be used for the purpose of this study. They define inflation targeting as:

> … a framework for monetary policy characterised 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.

Therefore, as a rule, inflation targeting involves the formal establishment of price stability as the primary (not necessary sole) objective of monetary policy, and takes

precedence over any other listed objectives. The idea behind this practice is to send a clear message about the main tasks and criteria of monetary policy to be used for assessing the performance of the central bank. Moreover, looking at the definition of inflation targeting provided for the purpose of this study, emphasis is placed on the cardinal elements of the inflation-targeting framework. In essence, the definition means that inflation targeting is a policy framework of announcing what the bank is going to do, and then doing it, that is, the bank takes a decision on the inflation rate -- which can either be a target point (with or without a tolerance interval) or a range -- announces or communicates it to the public, and pursues the inflation target.

Nevertheless, not many countries have correctly applied the concept of inflation targeting. Moreover, it has long been recognised that even though a country has announced that it has adopted the inflation-targeting framework, it may not necessarily be following policies that are compatible with it. However, the problem with this specific definition of inflation targeting is that price stability is the primary monetary objective of most central banks today. Yet many of them that are not generally termed inflation targeters, publicly announce numerical targets. Obvious examples are the European Central Bank (ECB), the Swiss National Bank (SNB), and the Bundesbank that all have monetary-policy frameworks with all the characteristics of an inflation-targeting framework, but they do not consider themselves to be inflation targeters (Pétursson 2005; Schmid 1998; Amato & Gerlach 2002:782). Consequently, other authors such as Paulin (2000) and Mishkin (2000) propose formal criteria that can be helpful in defining the inflation-targeting strategy. They propose the application of 'inflation-targeting elements' that can be used to discriminate between inflation targeting and other monetary-policy strategies. Authors, such as Mishkin and Savastano (2001), and Svensson (2000) emphasise the importance of these inflation-targeting elements by suggesting that they are main pillars for a full-fledged inflation-targeting framework. Moreover, these authors

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suggested criteria that are representative of those found elsewhere in the inflation-targeting literature.

According to these authors, inflation targeting as a monetary-policy strategy encompasses the following principal elements that guide how a monetary policy should be executed:

i. a public announcement of the adoption of an explicit, inflation-targeting framework;

ii. official, quantitative (low) targets that are to be achieved through an inflation-targeting framework;

iii. price stability as the long-run goal of monetary policy, while other goals are subordinate;

iv. increased transparency of the monetary-policy strategy by communicating the plans, objectives, and decisions of the monetary authorities to the public and the markets, as well as the nature, rationale, and importance of inflation targeting;

v. increased accountability of the central bank for the attainment (or non-attainment) of the set inflation targets; and

vi. the use of an information-inclusive or intensive strategy (defined as one in which the central bank does not rely only on information from monetary aggregates or exchange rates to set policy) for deciding the setting of policy instruments.

On the basis of the distinguishing features mentioned above, inflation targeting would seem best described as a general framework that incorporates the best elements of different forms of different monetary-policy regimes, rather than being a genuinely new policy framework or a formal rule (Bernanke *et al.* 1999a). This argument

suggests that inflation targeting is best if it were to be viewed as a range of strategies to be used (Amato & Gerlach 2002).

Although certain criteria such as a high level of transparency are unclear, the use of criteria or elements sends a strong message to central banks that there are no shortcuts to inflation targeting. It would therefore be risky if they were to adopt or maintain other, less desirable policy strategies. Moreover, the list of inflation-targeting elements helps to clarify a crucial point about inflation targeting: it entails much more than a public announcement of numerical targets for inflation for the year ahead. It also requires other features such as those highlighted by Jonsson (1999). Jonsson (1999) accentuates other inflation-targeting elements, or basic ingredients as he calls them, which include the periodic assessment of expected inflation; systematic adjustments of monetary-policy instruments; a forward-looking strategy that requires a forecasting model; an efficient financial market; a flexible policy rule; and good judgement by the central bank, which he considers to be indispensable. Although the list provided in this study is not exhaustive of all inflation-targeting elements found in the literature on inflation-targeting, such as the work of Svensson (2000), and Mishkin and Savastano (2001), it contains the main features of an inflation-targeting framework. However, what is the nature of the inflation-targeting framework?

2.3   THE NATURE OF AN INFLATION-TARGETING FRAMEWORK

When one looks at the consensus regarding the new classical model of macroeconomics, it is clear that inflation targeting has a rather recent history of analysis. Economic literature describes inflation targeting as a means to improve inflation control and at the same time to increase the credibility of a monetary policy. Furthermore, the inflation-targeting view has its historical roots in the work of

Wicksell, and could therefore be referred to as the Wicksellian Revival (Rochon 2004). Knut Wicksell, the father of New Neoclassical Synthesis (NSS) offers central banks a "user friendly", though rigorous, theoretical framework consistent with current practice of systematic stabilisation policy based on interest rate rules.

Within the inflation-targeting framework, monetary policy is aimed directly at the end objective for inflation with no clear-cut intermediate target. Moreover, monetary policy has no long-run effects on unemployment, real wages, income distribution or growth. Its only effect is confined to inflation (Palley 2007; Goodfriend 2007). Central banks set their policy interest rates according to inflation rates, or inflation expectations relative to their target (Setterfield 2006; Lundborg & Sacklen 2006). Maintaining low and stable inflation is therefore the best contribution that a monetary policy can make to achieve high and stable levels of growth and employment. To that end, the primary objective of a monetary-policy framework is price stability.

Furthermore, proponents of the inflation-targeting framework generally ignore cost-push inflation and emphasise demand-pull inflation. They argue that supply shocks are transitory in nature or will cancel each other out at a random walk. However, the recent inflationary pressures from the price of food, energy or commodities do not seem to be transitory. They appear to be significant and have probably brought about a permanent change in relative prices globally, an issue that does not allow central banks to sit back idly or ignore. The current challenge for monetary policy-makers is to distinguish between essentially three types of commodity-price shocks: first, those that are of relatively short duration, and are mean reverting; second, those that involve once-off relative price adjustments that are sustained at the new levels; and thirdly, those that involve a sustained increase in the price of the commodity (Palley 2007; Goodfriend 2007). Moreover, Rochon and Rossi (2006) highlight that inflation-targeting proponents require central banks to have only one instrument, namely an

interest rate to deal with shocks; and one target, namely inflation. Thus, proponents of the inflation-targeting framework recommend the application of the "Tinbergen Rule" in practice. The Tinbergen Rule was first formulated by Tinbergen (1952) and was named after Jan Tinbergen, the first Nobel Laureate in Economics in 1969. The rule states that the number of policy objectives cannot exceed the number of policy instruments. Moreover, multiple targets will endanger the success of a monetary policy and thus lead to inefficiencies in monetary policy. Monetary policy inefficiencies may occur due to monetary authorities' lack of co-ordination of monetary policies and the economic problem before taking action that might aggravate economic problem. However, why is combating inflation essential under inflation targeting? This study will now turn to this question in an attempt to provide answers to it.

2.4   WHY COMBATING INFLATION IS ESSENTIAL UNDER INFLATION TARGETING

According to Rochon and Rossi (2006) and Debelle *et al.* (1998), the emphasis on fighting inflation, either by directly targeting the inflation rate or by some general reference to price stability, relies on traditional, mainstream arguments about inflation. They argue that:

i.   Inflation makes it difficult for economic agents to recognise changes in the relative prices of goods and services because these changes are obscured by fluctuations in the general price level. As a result, firms and consumers can make the wrong production and consumption decisions, which then lead to the inefficient allocation of resources;

ii.   It leads to more speculative investment and reduces productive investment because nominal interest rates include an inflation risk premium to compensate creditors for the risks associated with holding nominal assets over the long term;

iii.   Inflation makes it more likely that individuals and firms take resources from productive uses to hedge against inflation, which hinders economic growth; and

iv.   High inflation leads to yet other inflation rates, encourages capital outflow, and can even create social and political instability as the weakest social groups often suffer the most from inflation because they have only limited possibilities to hedge against it.

These detrimental economic and social effects of inflation explain the overriding emphasis of modern central banking on maintaining a low and stable rate of inflation as reflected in the increasing number of countries adopting an explicit inflation-targeting framework (Pétursson 2009). Thus, inflation-targeting advocates argue that adopting inflation targeting would institutionalise good monetary policy and impose discipline on reluctant central banks. However, is inflation targeting a "one-size-fits-all" mechanical framework?

2.5   IS INFLATION TARGETING A ONE-SIZE-FITS-ALL?

The answer to this question is certainly not simple as inflation-targeting strategies are not identical across countries and have been modified depending on circumstances, that is, every country that has adopted the inflation-targeting framework has customised this approach in various ways (Ortiz & Sturzenegger 2007; Roger & Stone 2005). Therefore, no two countries and their central banks identically construct

or implement their inflation-targeting frameworks (Karagedikli & Lees 2004). Thus, there are different versions of an inflation-targeting framework or, simply put, inflation-targeting strategy is a creature with many faces of individual frameworks reflecting economic, political and cultural factors. Essentially, it is a creation of central banks (Filardo and Genberg 2010:251).

Based on the clarity and credibility of central bank's commitment to the inflation target, a paper by Carare and Stone (2006:1297) distinguish three inflation-targeting frameworks:

i.   full-fledged inflation targeting;
ii.   eclectic inflation targeting; and
iii. inflation-targeting lite.

A full-fledged inflation targeting is the best known form of inflation targeting and about 25 countries in this study have implemented this form of inflation targeting (see Tables 1A and 1B on pages 33 and 34). Moreover, these countries have clearly committed to their inflation targets and satisfy most of the inflation-targeting conditions that will be discussed in section 2.6.

The second form of inflation targeting, that is eclectic inflation targeting, falls short of the full-fledged inflation targeting by excluding full transparency and accountability of inflation targets by the monetary authorities. Thus, an eclectic inflation-targeting framework is implemented by countries that have monetary-policy frameworks with all the characteristics of an inflation-targeting framework but lacks transparency and accountability in their inflation targets. Moreover, inflation is not the sole target of monetary policy under an eclectic inflation-targeting framework. Other objectives

such as output stabilisation are pursued and given similar weight with inflation (Carare & Stone 2006:1297).

The last form of inflation targeting is inflation-targeting lite (ITL). Inflation-targeting lite is common among emerging-market economies that routinely report numerical inflation targets or objectives as part of government's economic plan for coming years while other inflation-targeting elements are not satisfied. These countries use inflation targeting to define their monetary-policy framework, but for a number of reasons they are not in a position to put top priority to inflation targeting in relation to other objectives. Some emerging-market economies have used this lighter version of inflation targeting either as preparation for full-fledged inflation targeting or because of concerns about the implications of committing themselves to full-fledged inflation targeting (Freedman & Laxton 2009a). Moreover, this form of inflation targeting is implemented by countries that lack most of the inflation-targeting conditions (see section 2.6). Hence, it is also known as a transitional framework to a full-fledged inflation-targeting framework. This is because, during the transition period, monetary authorities implement reforms required before a full-fledged inflation targeting can be practised (Carare & Stone 2006:1297). Thus, the transitional framework is aimed at maintaining monetary policy stability until the implementation of structural reforms in support of a single nominal anchor. Eclectic inflation targeting and inflation-targeting lite are also referred to as an implicit inflation-targeting framework. This is because both frameworks lack all the elements of the full-fledged inflation-targeting framework. Implicit inflation targeting can be defined as a period during which inflation targets are announced to the public, but not the inflation-targeting framework and its details as such. Thus, the country acts as though inflation targeting is in place, without the formal adoption of the framework. Moreover, under implicit inflation targeting, the central bank would also have other intermediate targets such as an exchange-rate or monetary-aggregate targets. However, most, if not all, inflation-

targeting countries used the implicit inflation targeting to reduce inflation from two-digit to single-digit levels. Inflation targets used during the transitional periods were also reduced along declining inflation rates (Vega & Winkelried 2005).

Moreover, Lim (2009:110) argues that the operational details of the inflation-targeting framework vary and are described variously as pure inflation targeting; flexible inflation targeting; forward-looking inflation targeting; and strict inflation targeting, to name but a few. However, even though central banks talk about strict inflation targeting (that is focus exclusively on inflation), no central bank has come close in practising it in both theory and practice. Today all inflation targeting is of the flexible variety and pay attention to other macroeconomic variables (Bernanke 2003c). Ball (1999) in Issing (2004) relates flexible inflation targeting to efficient policy rule. Under flexible inflation-targeting framework, there is some weight on output variability in the banks objective function while the inflation objective is not discarded. Moreover, there is a more pragmatic approach to the speed with which inflation is brought back to the target range or point. Additionally, flexible inflation targeters behave in ways consistent with a concern for both inflation and real economic stability (Walsh 2009).

The different inflation-targeting frameworks mentioned by Lim (2009:110) and Carare and Stone (2006), and underlying economic structures suggest that countries choose the regime that best fits their circumstances.

Other authors such as Wagner (2000), Jansen (2001), and Svensson (1997) highlight other factors that make it difficult for an inflation-targeting framework to fit in all economies. These factors include, among others, the following:

  i.   a history of high inflation;
  ii.   macroeconomic instability;

iii.   vulnerability to speculative attack;

iv.   implementation problems;

v.   supply shocks;

vi.   the impact of monetary policy on the exchange rate;

vii.   unusual features such as vulnerability to volatile international capital flows;

viii.   the objective of monetary policy;

ix.   instruments of monetary policy;

x.   the inflation process;

xi.   designing the inflation target; and

xii.   forecasting inflation.

Moreover, another factor that suggests that inflation targeting is not a one-size-fits-all approach is the issue of requirements or preconditions that are considered necessary for the effectiveness of an inflation-targeting strategy (Daianu & Lungu 2007:40). Therefore, the inflation-targeting conditions are supportive policies that are crucial for the success of inflation targeting. Inflation-targeting literature presented by Eichengreen *et al.* (1999) suggests that in any country where these conditions are not met, the benefits of inflation targeting are limited, or the central bank should refrain from targeting inflation if these prerequisites or preconditions are not present. However, Truman (2003) highlights the lack of consensus regarding the set of necessary preconditions that countries must meet to ensure success.

2.6   INFLATION-TARGETING PRECONDITIONS

Preconditions for inflation targeting are highlighted by, among others, Gottschalk and Moore (2001:27), and Freedman and Ötker-Robe (2009). They have identified

several requirements or foundations on which successful, full-fledged inflation targeting is built, including the following, but not limited to:

i.   the independence of the central bank;

ii.   the absence of a nominal anchor other than inflation;

iii. a well-developed financial system;

iv.   sound fiscal policy;

v.   a well-understood transmission mechanism between monetary-policy instruments and inflation;

vi.   a well-developed ability to forecast inflation; and

vii. a transparent and accountable monetary policy.

Each of these preconditions will now be discussed separately.

2.6.1   The independence of the central bank

A crucial issue when considering the implementation of inflation targets is the matter of the independence or autonomy of the central bank (Crowe & Meade 2007). Autonomy implies discretion to central banks to decide on the timing and nature of monetary policy intervention. The intellectual case for central bank independence rests on two pillars, namely theoretical and empirical case. Moreover, the need for central bank independence is the fear that government may exploit monetary policy for short term gains. Letting government play a role in setting short-run targets run the risk of compromising long run objectives. This possibility is limited by forcing government to adhere to a rule or by insulating the central bank from direct political control through the establishment of an independent central bank. However, delegation of authority to an independent central bank is sometimes criticised as being undemocratic on the grounds that in entrusts economic policy to technocrats

who have not been elected by voters. This dilemma becomes more important in times of particularly large unexpected shocks. Central bank independence, however, has several dimensions, namely political and economic independence. In a long line of research dating to Kydland and Prescott (1977), Barro and Gordon (1983), and Carlstrom and Fuerst (2009), authors have argued that a larger degree of independence of the central bank improves average inflation rates. Thus, inflation targeting requires independent central banks that will place greater weight on inflation than society does. Moreover, it must be given all the powers to execute its monetary policy as it sees fit, or follow the way it believes that the objectives will be achieved most adequately, and be able to use its discretion without any political pressure. Therefore, banks must be able to adjust policy instruments as they consider necessary (Rogoff 1985). Fully independent central banks should be able to stand up to political and social pressure in setting policy rates, that is, they can resist pressure to make short-term policy decisions that are at odds with their long-term objectives (Jeanneau 2009). Independence also requires that, in its monetary policy, a central bank is not constrained by other considerations such as the need to finance the government budget deficit (Jansen 2001). Moreover, the theoretical argument that explains the negative relationship between the autonomy of the central bank and inflation is based on the widely accepted rule that states that the achievement of price stability requires the imposition of constraints on monetary expansion. Empirical experiences in Western market economies suggest that the independence of the central banks is a cornerstone for controlling inflation. Hence, it is sometimes concluded that the independence of the central bank is a general and sufficient requirement for controlling inflation (Wagner 2000). Although the independence of the central bank is a well-established principle among inflation-targeting central banks, the degree of autonomy from the government in decision-making varies considerably among them. However, the degree of central bank autonomy is generally determined by four elements of its legal underpinnings:

i. a clear, precise and uncontradictory mandate;

ii. clearly specified relationship with the state;

iii. central bank powers to make monetary-policy decisions; and

iv. an appointment process and term limits for central bank officials (Meade 2009:58).

Lybek and Morris (2004:9) and Heenan *et al.* (2006:5) classify the independence of a central bank into four levels of decision-making:

1. *Goal autonomy*

This is the broadest degree of autonomy and authority. In principle, goal autonomy gives the central bank authority to determine its primary objective from among several objectives included in the central bank law or rarely to determine the objective if there is no clearly defined objectives.

2. *Target autonomy*

This form of autonomy is very close with the goal autonomy. However, in contrast with gaol autonomy, target autonomy has one clearly defined primary objective stipulated in the law.

3. *Instrument autonomy*

Instrument autonomy implies that the government or monetary authority decides on the monetary-policy target. However, this decision is done in agreement with the central bank and the central bank retains sufficient authority to implement monetary policy target using the instrument it sees fit.

4. Limited or no autonomy

Limited or no autonomy refers to a case where the central bank has no say either about objectives or targets as well as about influencing policy implementation, thereby rendering the central bank a government agency. In practice, however, these distinctions are less clear cut.

The central bank independence precondition primarily relates to the instrument independence of a central bank, which in reality means the ability of a central bank to conduct its monetary policy (to choose the instruments) towards attainment of the objective of low inflation independently of political pressure. Therefore, the independence of the central bank is almost irrelevant if there is no general commitment to the inflation-targeting framework to give it legitimacy. Mishkin (2008) further argues that writing the mandate into law is not necessarily required or, in some cases, not necessarily sufficient as a law may matter less than the commitment of the general public and that of politicians to support price stability. Nevertheless, the independence of a central bank is not absolute, as central banks cannot operate without regard to the political economy of their environment. An excessive focus on inflation without regard to real variables could undermine the independence of a central bank, and government would move to reduce the degree of its independence (Mishkin 2008). Hence, Schmulow and Greyling (1996) suggest that no matter how deeply enshrined by law the independence of the central bank is, it will always be subjected to the influence of the political environment within which it finds itself.

2.6.2 The absence of a nominal anchor other than inflation

The credibility and transparency of inflation targeting depend upon a clearly defined objective to achieve price stability, and on the absence of other nominal objectives.

Hence, within the inflation-targeting framework, the monetary authority is required not to have any commitment to the level or path of any other nominal variable such as wages, the level of employment, and the nominal exchange rate, that is, there should be a sole target within the system (Masson *et al.* 1997). Moreover, Lim (2009:112) argues that a floating exchange-rate regime is a requirement for a well-functioning inflation-targeting framework since, in a world of high capital mobility, independent monetary policy cannot co-exist with a pegged exchange-rate regime – the so-called impossibility of the "holy trinity". The impossibility of the "holy trinity" refers to the assumption by some central banks that they can implement inflation targeting together with some form of foreign-exchange intervention policy. Brenner and Sokoler (2010:296) show that both policies are not sustainable. This is because there could be a conflict between inflation and the exchange-rate target, especially when capital can move freely in and out of the country, or proceeding structural adjustment in the economy is likely to be associated with higher exchange-rate volatility. This potential conflict between the two policies can be costly to the economy and will eventually result in the abandonment of one of these policies. Israel is a good example in this case. Israel implemented inflation targeting together with a widening exchange rate band. However, the difficulties of maintaining both inflation targeting and exchange rate policies led to the abandonment of the exchange-rate target in June 1997. This, however, does not mean that the exchange rate has disappeared from policy discussion. As a result of the impossible "holy trinity", inflation-targeting countries have floated their currency or have moved to more flexible exchange rate frameworks. Nevertheless, inflation-targeting countries often use interest rates or currency intervention to influence their exchange rates. Therefore, central banks acknowledge that since exchange rate changes affect inflation, they play a role in monetary policy (Civcir & Akçağlayan 2010:340).

The connection between inflation targeting and floating exchange rates has led some analysts to argue that one of the costs of inflation targeting is the increase in exchange-rate volatility. However, a central bank that adopts inflation targeting and preserves a fixed exchange-rate system subordinates monetary-policy decisions in favour of the exchange rate, and induces doubt about the policy objective. Moreover, the public will not be sure as to whether the central bank prefers an inflation target to an exchange-rate objective at all costs, or whether it sacrifices the inflation objective to the advantage of the exchange rate. Since the public will have no assurance that the monetary authority will give the inflation-target precedence over the exchange rate, the policy will not have the credibility needed for success. In other words, a pertinent choice is required between defending the exchange rate and steering inflation, as the central bank will be unable to achieve its inflation target and exchange-rate target at the same time. Hence, the inflation-targeting framework requires that central banks treat the inflation target as the focal policy goal while the exchange-rate stability is regarded as a policy-indicator variable (Orlowski 2008).

2.6.3   A well-developed financial system

More than the regime of any other monetary policy, the regime of inflation targeting relies upon well-developed financial markets and a sound banking system. A well-developed financial system is required for three reasons:

i.   to avoid fiscal dominance;

ii.   for a central bank to conduct market-orientated policies; and

iii. for the market operations system of a central bank to be effective without becoming disruptive (Mishkin 2004).

A sound banking system and well-developed capital markets minimise potential conflict with the objectives of financial stabilisation, and guarantee effective monetary-policy transmission. Thus, financial stability should be sufficient in any inflation-targeting country to enable the monetary policy of the central bank to pursue inflation targets and not be sidetracked by concerns about the health of the financial sector. Moreover, well-functioning financial markets facilitate the formulation of monetary policy under inflation targeting and contribute to the effective execution of monetary-and foreign-exchange operations. Thus, financial markets should be sufficiently well developed for monetary policy to be implemented by using market-based instruments, and to ensure that the conduct of monetary policy is not complicated by a weakness in the financial-market infrastructure (Carare *et al*. 2002). The monetary authorities need access to policy instruments that are effective in influencing the economy, and money and capital markets must be sufficiently developed to react appropriately to their use. Within a well-developed financial environment, policy changes by the central bank affect money-market interest rates in a clear and transparent manner. Fragile banking systems are particularly precarious and are an obvious consequence of prolonged periods of financial repression. In a weak banking-system environment, a central bank cannot raise the interest rate to sustain the inflation target because this will likely lead to a collapse of the financial system. Not only can this cause a breakdown of the inflation-targeting framework directly, but it can also lead to a collapse in currency and a financial crisis that will erode the control of inflation (Mishkin 2004). Shallow capital markets are also a common, though more subtle, indication of fiscal dominance. They are often a by-product of government schemes to extract revenue from the financial system through various forms of financial repression, including interest-rate ceilings, high reserve requirements, sectoral-credit policies, and compulsory placements of public debt (Orlowski 2008).

2.6.4 Sound fiscal policy

To maintain operational autonomy, many inflation-targeting central banks have explicit provisions in the law, limiting or even prohibiting the central bank to finance fiscal deficits (Barnichon & Peiris 2008). Fiscal policy affects monetary policy and inflation in various ways, such as the monetisation of public deficit, a reluctance to raise the interest rate when necessary, and so forth. In case of large public debt, the monetary authority might be reluctant to raise the interest rate if such a move is necessary to fight inflation pressure because an increase in the interest rate raises the cost of debt service and hence the level of debt. Therefore, the proponents of an inflation-targeting strategy consider fiscal policy as inflationary. In extreme cases, there is fiscal dominance, or fiscal policy dictates monetary policy. That is, inflation is determined by the dominance of fiscal policy over monetary policy, and fiscal policy influences monetary policy by exerting strong political pressure on the central bank (Woodford 2001b). Moreover, following monetary-policy theory, a monetary authority exercises limited control over inflation development under the condition of fiscal dominance (Barnichon & Peiris 2008). The main argument against fiscal dominance, however, is that a central bank cannot influence the size of the government's budget deficit and must not be required to finance the government budget deficit. If a central bank is forced to finance the budget deficit or monetise the debt of government, it eventually does so by "creating money" – seignorage, which generates higher inflation. In such a situation, the ability of monetary policy to focus on inflation will be undermined (Sherwin 2000; Sargent & Wallace 1981). As a result, large budget deficits and large government debt hamper the control of inflation; can lead to the abandonment of the inflation-targeting policy; or could lead to excessive tightening of monetary policy. Reliance on seignorage is perhaps the simplest and most common indication of fiscal dominance. Hence, for inflation targeting to succeed in achieving the set targets, the monetary authority must be free from fiscal dominance. Freedom

from fiscal dominance implies that public finances are stable and government borrowing from the central bank is low. Moreover, to finance government deficits, fiscal deficit should be limited to a level that can be financed through the operation of the capital market, especially in economies where there is limited access to financial markets (Carare *et al.* 2002). Restrictions on the central bank's direct and indirect monetary financing of the government make it possible to separate monetary and fiscal policy, leaving more authority to the central bank (Tuladhar 2005).

2.6.5   A well-understood transmission mechanism between monetary-policy instruments

An inflation-targeting central bank should be in a position to influence inflation through its policy instruments (Carare *et al.* 2002). In implementing its own monetary policy, the central bank also needs to have a sound knowledge of how its policy and decisions are transmitted to the economy, affecting aggregate demand, inflation expectation, and the inflation rate; that is, there should be a reasonable understanding of the links between the stance of policy and inflation. This is particularly important for the adoption of an inflation-targeting framework that is a forward-looking monetary policy. Monetary policy can only be effective where transmission channels or the estimation of the time lags are properly understood by policy-makers, and when such channels are also working effectively (Wagner 2000).

2.6.6   A well-developed ability to forecast inflation

The difference between inflation targeting and other monetary-policy frameworks is that inflation targeting makes forecasting explicit and transparent. Hence, inflation forecast is central to any inflation-targeting framework. Moreover, inflation forecasts play an increasingly important role under the inflation-targeting framework, both in

policy deliberations and communications with the public (Woodford 2007:3). Prospective inflation targeters should be confident that they can obtain enough reliable information on the outlook of inflation to enable them to present inflation forecasts that are considered credible in the eyes of financial market participants and the public (Carare *et al.* 2002). Consequently, data or information requirements for inflation targeting are more demanding than for alternative monetary-policy frameworks. This is further aggravated by the fact that inflation targeting requires the use of all available information on the outlook of inflation to forecast future inflation. Moreover, the monetary authority must possess technical, institutional, and a well-developed capacity to model and forecast inflation. According to Woglom (2005:306), '… inflation forecast is not an end in itself, but input in the planning process.'

2.6.7 Transparent and accountable monetary policy

The rationale for transparency is that it will reduce uncertainty through better communication of the goals and procedures of the central bank; contribute to high-quality decision-making by central banks and afford considerable leverage to central bankers in influencing the beliefs of economic agents. As a result, many central banks have a communication strategy to help them achieve greater transparency. Moreover, the element of transparency provides the general public with assurances that monetary policy and financial-system policies are not manipulated by politicians. Therefore, transparency allows for democratic scrutiny of the central bank by the public to better assess both its competence and commitment to the inflation target.

Inflation-targeting frameworks involve enhanced disclosure of policy-related information such as meticulous descriptions of how the inflation objective will be achieved and over which time horizon; which policy instruments will be used; and how assessment of economic variables, especially the inflation process that could

influence decisions and risks, will be treated (Jeanneau 2009). Thus, the public should be informed about the monetary-policy framework and how the policy is to be conducted.

Moreover, central banks that decide to adopt inflation targeting should be held accountable for the actions they take to pursue the inflation targets. Thus, accountability is essential because policy-transmission lags make it difficult for the public to monitor policy performance on an ongoing basis (Debelle *et al.* 1998). Central banks are accountable to the public and state hence they derive their statutory authority that can be legislative committees, ministers of finance, or supervisory boards. In general, however, accountability has three characteristics:

i.   it is open to scrutiny by others;

ii.   it enforces regular accounting for one's actions; and

iii.   it runs the risk of negative repercussions if performance is considered to be unsatisfactory (Geraats 2009:135).

Therefore, accountability centres on an evaluation of performance of the central bank.

The choice of the accountability mechanism generally depends on the nature of responsibilities of the central banks. The main accountability mechanisms used to hold the central bank accountable for its policy performance and actions include the publications of regular inflation- or monetary-policy reports; the publication of special reports or open letters in the event of significant misses of the target; the use of an escape clause to limit the accountability of the central bank in particular circumstances, as the duty to indicate, in advance, how policy will react to certain kinds of shocks; publishing minutes of policy meetings within a reasonable time

frame, and holding press conferences and analyst briefings following the release of policy decisions and monetary-policy reports (Heenan *et al.* 2006:11).

In addition, it helps to insulate monetary policy from outside political pressures. To ensure that the public has enough information to hold the central bank accountable, the monetary-policy framework under inflation targeting must be transparent. That is, the inflation target needs to be made explicit and public. The public should have a clear understanding of the principal monetary-policy operations that are executed and the indicators that best reflect the stance of monetary policy. Moreover, announcements of changes in the stance of monetary policy should be accompanied by explanations of the factors that have motivated the changes and the expected effects on the inflation outlook. Further, the central bank should signal any expected, potential breaches to avoid situations where the credibility of the inflation-targeting framework is undermined by target breaches (Carare *et al.* 2002).

2.6.8   The economic structure

Pétursson (2009) identifies the economic structure as an important requirement. The issue is one of appropriate responses to commodity prices and exchange rate changes. However, Batini *et al.* (2006) note that prices should be fully deregulated and that the economy should not be overly sensitive to commodity prices and exchange rates; that is, monetary policy should be able to influence a significant proportion of the price index. Furthermore, if prices are generally administered, this also renders inflation control less effective. Therefore, although fiscal policy can be supportive of monetary policy in a number of ways, such as ensuring a lack of fiscal dominance, the pervasiveness of administered prices could also undermine the ability of the central bank to successfully control inflation, particularly if these prices are set with no regard to underlying supply-and-demand conditions.

Although most inflation targeters share many similar features or elements, practical experience indicates that there is a considerable variation in some of the specifics among all the inflation-targeting countries. At the level of implementation, for example, central banks differ with respect to choice of a price index; target width; target horizon; target band or point; escape clauses; and accountability of target misses. Further differences lie in goal independence; decision-making processes; and overall transparency regarding the conduct of monetary policy under inflation targeting (Bollard & Hunt 2005; Ortiz & Sturzenegger 2007). Moreover, central banks that pursue the inflation-targeting policy need to be very careful in choosing the relevant price index to be targeted. Thus, for the inflation-targeting policy, the selection of the basket from which the price indices is calculated, is no less important than the level of targeted inflation as the effects of central-bank policies on prices can vary, depending on both the price index chosen and the policy instruments used (Akdi *et al.* 2006). Moreover, the choice of a price index is complicated by the fact that there are various candidates from which to choose, such as the Consumer Price Index (CPI), or some variants, namely, the wholesale price index and the Gross Domestic Product (GDP) deflator, none of which is ideal, but different indices can yield different inflation rates (Mohr 2008; Kirsanova *et al.* 2006).

However, in most cases, the inflation objective is set for a measure of overall consumer-price inflation or something similar for both practical and operational reasons. Thus, consumer-price indices are usually employed, not necessarily because they are a better measure of changes in the general price level compared to other indices (Svensson 1999a; Huang & Zheng 2005). The CPI measure is the most familiar and understood measure among the general public, for the following reasons:

i.   it has been amply studied by index theorists;

ii.   it directly indicates changes in the cost of living for consumers on fixed nominal incomes;

iii.   it is reliable;

iv.   it is not subject to correction;

v.   the method by which it is calculated is more precise;

vi.   its relative timeliness or that it is regularly published by authorities separate from the central banks; and

vii.   the fact that it is widely used for many varieties of contracts. (Alamsyah *et al.,* 2001; Mankiw & Reis 2003).

An objective for underlying inflation is set for a future-stated time period to provide guidance to economic agents and to also serve as a yardstick to measure the success of the central bank. Tables 1A and 1B present evidence that most countries that have adopted an explicit inflation-targeting policy are targeting the CPI or its variants.

Table 1A. Inflation-targeting adoption dates and targets: Industrialised countries

Country	Inflation-targeting adoption date	Target measure	Target range*	Point	Target type	Horizon
New Zealand	Mar. 1990	HCPI	1 - 3,0%	-	Range	Medium term
Canada	Feb. 1991	HCPI	+/- 1,0%	2,0%	Point	Six - eight quarters
The UK	Oct. 1992	HCPI	+/- 1,0%	2,0%	Point	At all times
Sweden	Jan. 1993	HCPI	+/-1,0%	2,0%	Point	2 - 3 years
Australia	Apr. 1993	HCPI	2 - 3,0%	-	Range	Business cycle
Iceland	Mar. 2001	HCPI	+/- 1,0%	2,5%	Point	Long term
Norway	Mar. 2001	HCPI	+/- 1,0%	2,5%	Point	Medium term

* A number preceded by (+/-) means is the tolerance level for a point in the point column. Source: Tuladhar (2005); Hu (2006); Hammond (2009); Truman (2003); Batini *et al*. (2006); Heenan *et al*. (2006); and The websites of the central banks.

Table 1B.   Inflation-targeting adoption dates and targets:
            Emerging-market economies

Country	Inflation-targeting adoption date	Target measure	Target range*	Point	Target type	Horizon
Israel	Jun. 1997	HCPI	1 - 3,0%	-	Range	Indefinite
The Czech Republic	Jan. 1998	HCPI	+/-1,0%	3,0%	Point	Multi-year
Poland	1999	HCPI	+/-1,0%	2,5%	Point	Multi-year
Brazil	Jun. 1999	HCPI	+/-2,0%	4,5%	Point	Yearly target
Chile	Sep. 1999	HCPI	+/-1,0%	3,0%	Point	24 - months
Colombia	Sep. 1999	HCPI	4,5 - 5,5%	-	Range	Yearly target
South Africa	**Feb. 2000**	**HCPI****	**3 - 6,0%**	**-**	**Range**	**On a continous basis**
Thailand	May 2000	Core CPI	0 - 3,5%	-	Range	Eight quarters
South Korea	Apr. 1998	HCPI	0,5%	3,0%	Point	Three years
Mexico	Jan. 2001	HCPI	+/-1,0%	3,0%	Point	Medium term
Hungary	Jun. 2001	HCPI		3,0%	Point	Medium term
Peru	Jan. 2002	HCPI	+/-1,0%	2,0%	Point	At all times
The Philippines	Jan. 2002	HCPI	+/-1,0%	3,5%	Point	Two years
Indonesia	Jul. 2005	HCPI	+/-1,0%	4,5%	Point	Medium term
Romania	Aug. 2005	HCPI	+/-1,0%	3,5%	Point	Annual target for two years horizon
Turkey	Jan. 2006	HCPI	+/-3,0%	7,5%	Point	Multi years (Three years)
Ghana	May 2007	HCPI	0 - 8,0%	-	Range	18-24 months
Serbia	Jan. 2009	HCPI	8 -10,0%	-	Range	Medium term

*A number preceded by (+/-) means is the tolerance level for a point in the point column.
Source: Tuladhar (2005); Hu (2006); Hammond (2009); Truman (2003); and Batini *et al.* (2006).
** CPIX for metropolitan and other urban areas until the end of 2008; headline CPI for all urban areas thereafter.

However, much has been debated about who should set and announce the inflation target. There are different practices in different countries (see Figure 1), but the norm tends to be that a monetary authority, which can be either the central bank or an elected government, chooses and publicises a target goal for an inflation rate for a

defined period. In some cases, the central bank and the government jointly announce the inflation target (Roger & Stone 2005; Tuladhar 2005).

Figure 1: Who sets the inflation target?

Source: The websites of the central banks
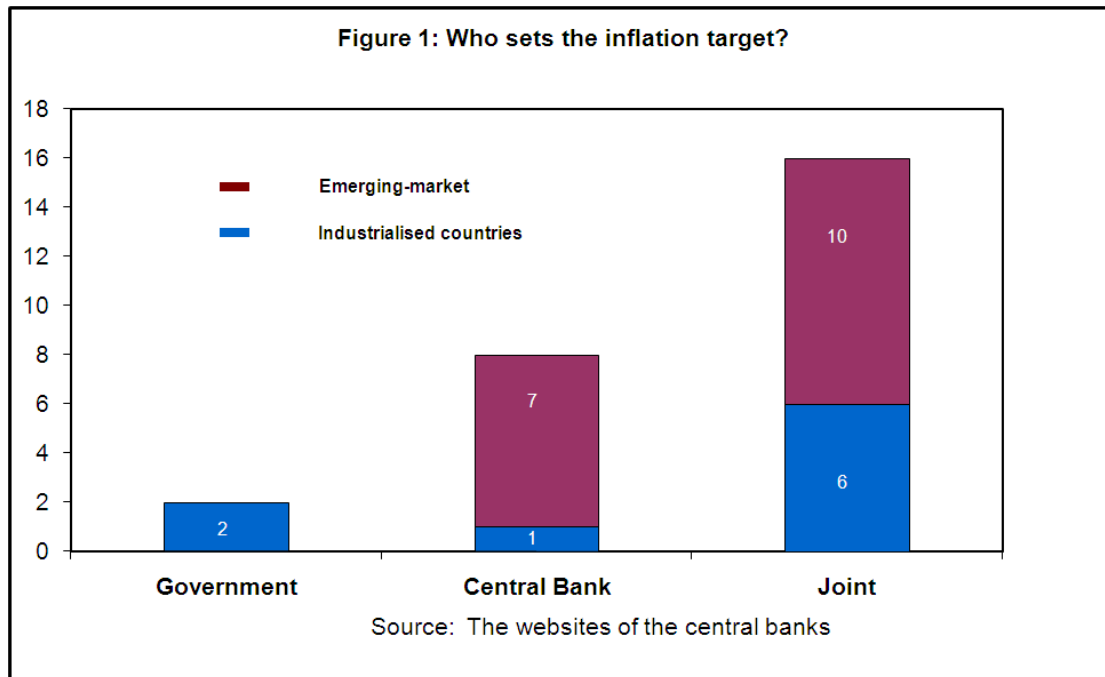
Inflation targeting involves more than simply targeting the rate of inflation as an objective of economic policy. Central banks set an explicit, long-run inflation goal, give that goal a certain pre-eminence and communicate vigorously about the conduct of policy relative to that goal (Nessen 2002). Since the target is explicit (legislated), it cannot be frequently reconsidered. This explicitness therefore serves as a commitment device. Moreover, long run means that the target is legislated for the business cycle, or longer (indefinite), as is common in industrial countries (Libich 2008). Laubach (2003) and Walsh (1999) add that the announcement of a targeted-inflation path extending to a few years ahead, coupled with the setting-up of procedures for public monitoring of how monetary authorities will pursue their objectives, should also be included. Perhaps this practice confirms Moreno and Rey's (2006) findings that inflation targeting may affect trend inflation but not monthly

and quarterly inflation. Therefore, their result is consistent with the fact that inflation-targeting strategies are more focused on year-on-year inflation than on high-frequency fluctuations.

Moreover, a debate has also surfaced regarding the decision-making process. Practical experience suggests that in the decision-making process, committees are preferred above individuals. Not one central bank has replaced a committee by a single decision-maker, a fact that has both theoretical and empirical support. The main explanation for this trend in literature is simple: two heads are better than one. Moreover, the greatest strength of making decisions by committee lies in the ability to draw diverse viewpoints from constituent members or to improve the quality of decisions. Further, it ensures that the public will not have divergent interpretations of the intentions of policy-makers, and it guarantees that economic agents will not have access to insider information and will be treated equally (Hao & Suen 2009; Maier 2008). Among other aspects, Figure 1, Tables 2A and 2B show different inflation-target setting and decision-making practices in inflation-targeting countries. From these tables it will be seen that 16 out of 25 countries jointly set the inflation target; the central bank of eight out of 25 countries set the inflation target; and in two out of 25 countries the inflation target is set by Government.

Table 2A. Institutions: Industrialised countries

Country	Who set the target?	Decision-making	Members (internal/ external)	Meeting frequency
New Zealand	Joint	Governor (MPC advice)	1 / 0	8
Canada	Joint	Governing Council	6 / 0	8
The UK	Government	MPC	5 / 4	12
Sweden	Central bank	Executive Board	6 / 0	7 - 8
Australia	Joint	RBA Board	3 / 6	11
Iceland	Joint	MPC	3 / 2	8
Norway	Government	Executive Board	2 / 5	8

Source: Tuladhar (2005); Roger and Stone (2005); Hammond (2009); Heenan *et al.* (2006); and The websites of the central banks.

Table 2B.   Institutions: Emerging-market economies

Country	Who set the target?	Decision-making	Members (internal/external)	Meeting frequency
Israel	Joint	Governor (MPC advice)	1 / 0	12
The Czech Republic	Central bank	Bank Board	7 / 0	8
Poland	Central bank	Monetary Council	1 / 9	12
Brazil	Joint	MPC (COPOM)	8 / 0	8
Chile	Central bank	Executive Board	5 / 0	12
Colombia	Central bank	Board of Directors	7 / 0	12
South Africa	**Joint**	**MPC**	**8 / 0**	**6 or more**
Thailand	Joint	MPC	3 / 4	8
South Korea	Joint	MPC	2 / 5	12
Mexico	Central bank	Board of Governors	5 / 0	11
Hungary	Joint	Monetary Council	3 / 6*	12
Peru	Central bank	Board of Directors	7 / 0	12
The Philippines	Joint	Monetary Board	7 / 0	8
Indonesia	Joint	Board of Governors	6 – 9 / 0	12
Romania	Joint	Bank Board	4 / 5	8
Turkey	Joint	MPC	6 / 1	12
Ghana	Joint	MPC	10 / 2	8
Serbia	Joint	MPC	4 / 0	24

Source: Tuladhar (2005); Roger and Stone (2005); Hammond (2009); Heenan *et al.* (2006); and The websites of the central banks.
* Four in 2010.

Much has been debated about the role played by other institutions under an inflation-targeting framework. Evidence shows that inflation targeting is not the responsibility of the central bank alone. Government, political, and private-sector institutions that have some influence -- be it direct or indirect -- to set the inflation target must also be dedicated to the inflation-targeting strategy. Walsh (1995) regards agreements on inflation targets as a contract among government, the central bank, and the political and private-sector institutions. Institutional commitment to the target from the rest of the economy is also required. This argument has led to some inflation-targeting literature, such as that of Felman (1997), proposing that inflation targeting is better defined as the attempt to institutionalise commitment to low inflation. However,

monetary-policy transparency and communication enhance or encourage institutional commitment. The argument for institutional commitment to low inflation re-emphasises the fact that the adoption of inflation targeting does not end with the announcement of a numerical target for a specified time frame or horizon nor does inflation targeting simply mean the setting of a target for the inflation rate. Rather, it is the adoption of a framework for the application of monetary policy. Advocates for inflation targeting argue that the inflation-targeting framework is not simply a cheap talk of the central bank as suggested by its critics, but the commitment to the achievement of the ultimate goal – the inflation target – has to be demonstrated by the mandated central bank and other institutions within the rest of the economy.

After the inflation target has been set and announced, the mandated central bank is forthwith responsible for achieving the set target and must provide regular public information about its strategies and decisions, that is, it should operate on a basis of transparency. The theory is that, should markets have a clear idea of what to expect, the risk of market dislocations following a surprise-rate move will be minimised. Consequently, central banks that follow inflation targeting typically put much more effort into explaining policy issues and decisions, as well as being more open about their operations and research. This openness informs the public about monetary policy and, over time, creates credibility for both the policy framework and the inflation target. Hence expectations about inflation become centred on the target and are less volatile, making monetary policy more effective and less costly (Goncalves & Salles 2008; Capistran & Ramos-Francia 2010). Monetary-policy credibility means that economic agents believe that, over time, inflation will be in line with the inflation target, while effectiveness in monetary policy implies that inflation expectations are stable and equal to the inflation target. Hence market participants' expectations about future changes in the key rate are based on the correct understanding of the central bank's policy-response pattern. In practice, inflation targets -- all the details relating

to the inflation-targeting framework -- are usually communicated to the public. By so doing, the central bank believes that it will indirectly gain control of inflation expectations by disseminating information that makes it more likely that people would price commodities in a way that is consistent with the goal of the central bank. Communication is therefore one of the crucial elements of the inflation-targeting framework. Heenan *et al.* (2006) identify different communication modes, and argue that the choice of the communication methods of the central bank largely depends on the nature of what is being communicated, and on the nature of the audience. Despite a wide range of communication methods, the list normally includes published documents, public presentations, unofficial presentations, educational activities, the website of the central bank, and direct correspondence with members of the public. Advocates for inflation targeting believe that, in practice, the communication of the central bank enhances monetary-policy transparency. Moreover, the communication process assists policy-makers to convince the public that the central bank has a long-term inflation objective. This belief emanates from the fact that the inflation-targeting central bank reveals its long-term inflation preference. Furthermore, proponents of inflation targeting believe that through communication, the central bank provides information that the public needs to concentrate expectations on a common trend (Smidkova & Hrncir 2000). Therefore, the importance of communication with regard to the inflation-targeting strategy is without any doubt useful in containing inflation expectations. Many proponents of inflation targeting, such as Bernanke *et al.* (1999a), support this argument.

While the control of inflation has always been an important concern of central bankers, and inflation targeting gives special and exclusive emphasis to this goal, it does not effectively skew the conduct of monetary policy of the central bank; and central banks are not obsessed with the inflation goal and apply definite rules without any discretion. The exclusive emphasis on the inflation goal by the inflation-targeting

framework signals that the inflation rate is the overriding objective of monetary policy. This means that, in the event of conflict between the inflation target and any other objective of monetary policy, such as an exchange-rate target or an unemployment-rate target, the inflation target dictates the monetary policy response. That is, the inflation goal takes precedence under this monetary-policy strategy. The inflation rate, which is the final target of monetary policy, is a direct target (Kurihara 2005). This description of the inflation-targeting approach implies that inflation targeting has inflation as its sole target. Other macroeconomic objectives or variables are subordinated in favour of the inflation target and can only be pursued to the extent that they are consistent with the inflation target (Debelle *et al.* 1998). Therefore, many inflation-targeting frameworks permit flexibility for pursuing other goals, such as output stabilisation, though the primary commitment of the central bank is clearly to control inflation. This means that the hierarchical mandate is compatible with inflation targeting as it makes price stability the primary objective for monetary policy and subordinates other potential objectives (Svensson 1999c; Rochon 2006).

To pursue other objectives, central banks use their discretion. An intriguing debate has arisen on whether inflation targeting is a constraint or a discretionary monetary policy. Evidence presented by Zimmermann (2003), and Bernanke and Mishkin (1997) supports this argument. The inflation-targeting strategy appears to combine both elements, that is, constraint as well as discretion, which are indispensable elements for successful inflation targeting. As a result, authors such as Leitemo (2003), and Bernanke and Mishkin (1997) describe inflation targeting as constrained discretion, which some argue this is both its weakness and its strength. Under constrained discretion, the central bank is free to do its best to stabilise output and employment in the face of short-run disturbances, with the appropriate caution born of imperfect knowledge of the economy and of the effects of policy (discretionary part of constrained discretion). However, in conducting a policy of stabilisation, the central

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bank must also maintain a strong commitment to inflation target and hence keep inflation expectations firmly under control – this is the constrained part of constrained discretion (Bernanke 2003c). Therefore, unlike the pure rules-based case which allows for no flexibility, inflation targeting defines a broad rule, but allows for some discretion that is constrained by the basic rule that, to some extent, could detract from the predictability of the framework.

This led to a similar debate on whether inflation targeting is a rule or a framework. Much has been debated on this issue. Writers such as Svensson (1999c), and Mahadeva and Sterne (2002) provide a solution to this predicament and describe inflation targeting as a framework, not a rule. Moreover, this argument appears to be supported by empirical evidence, and many advocates for inflation targeting highlight that, as implemented in practice, inflation targeting is characterised as a fairly broad framework for the conduct of monetary policy rather than a specific rule.

Apart from the independence of a central bank, all inflation-targeting countries require knowledgeable personnel and expertise in monetary-policy issues. These are necessary to facilitate the achievement of the set inflation target. Particularly critics of inflation targeting have continuously raised the need for expertise or knowledgeable personnel in the central bank. They regard the lack of knowledgeable personnel as an obstacle to the adoption of the inflation-targeting framework, mainly in emerging-market economies. By so doing, critics of the inflation-targeting framework treat central banks as myopic or incapable institutions. The aforementioned predicament is exacerbated by the fact that inflation targeting gives the central bank a goal, but does not inform the central bank how to achieve it. Thus, the central bank must plan its course of action which, without well-versed personnel or proficiency in monetary policy, can be futile.

2.7   THE TAYLOR RULE

Since the work of Taylor (1993) was published, it has been widely agreed that the appropriate monetary-policy instrument is the interest rate. The policy instrument for inflation targeting is indeed the short-term interest rate under the control of the central bank. To achieve the set inflation target, practical evidence shows that the central bank usually adapts its operating procedures to changing conditions under the inflation-targeting framework (Woodford 1999). Thus, the central bank steers monetary policy in an attempt to achieve the targeted inflation rate based on the information available (Rudebusch & Svensson 1999). Under inflation targeting, all economic data that can possibly affect inflation developments matter. If available information shows that inflation is edging above the target, the central bank will usually raise interest rates to cool down the economy, which will bring inflation down. Conversely, if inflation is considered too low, the central bank will lower interest rates to stimulate economic growth, thereby raising inflation in the process (Rochon & Rossi 2006; Kim & Henderson 2005). Sellon (2008) brings to light how central banks use monetary policy to achieve their inflation objective in practice. He shows that a change in the current policy stance is indicated if projected inflation over a one to two-year time horizon falls outside the announced range. Thus, expected future inflation, as measured by projected inflation, becomes an indicator variable for monetary policy (Green 1996). The projected inflation dictates the monetary-policy stance that central banks must communicate to the public. The difference between the forecast and the target determines the required adjustment of the monetary-policy instrument (interest rate), and hence monetary-policy decisions are guided by expected future inflation relative to an announced inflation target (Calvo & Végh 1995; Schmulow & Greyling 1996). Sellon (2008) further shows that central banks implement policy by moving the actual policy rate above or below the neutral rate

when output and inflation gaps are non-zero. Therefore, it is explicitly the interest rate that is changed to achieve monetary-policy objectives (Rommer 2000; Taylor 2000).

Levin (2004), Clarida *et al.,* (1998) and Cecchetti *et al.,* (2002) associate the interest-rate adjustment described above with the "Taylor Rule" or state that it can be well captured by one or another form of the Taylor type monetary-policy rule. While no central bank adheres strictly to the Taylor Rule, considerable empirical evidence suggests that the behaviour of many central banks can be approximated by such a relationship (Fontana & Palacio-Vera 2002). Nevertheless, this rule can be helpful in discussing the types of information that a central bank might provide to the public to achieve greater transparency. Moreover, Sellon (2008) argued that a convenient way of formalising the policy process is to think of a central bank as following the Taylor Rule. Thus, the inflation-targeting framework is associated with the Taylor Rule whereby the short-term interest rate instrument responds to deviations of expected future inflation from the target rate and to deviations of output from its full employment level. This policy rule specifies changes in the interest rate of the central bank according to what is happening to real output and inflation (Sims 2001). The inflation-targeting framework is based on similar principles despite the tough talk of inflation being the primary goal of central banks. Experience demonstrates that inflation-targeting central banks also care about output growth. Central banks control inflation through manipulation of the output gap in response to exogenous inflation shocks (Woodford 2001a). However, the question remains to be answered: what is the Taylor Rule?

The Taylor Rule is a monetary-policy rule that stipulates how much the central bank should change the nominal interest rate in response to divergences of actual inflation rates from target inflation rates and of actual GDP from potential GDP (Seyfried 2008). It was first proposed by U.S. economist, John B. Taylor, in 1993. Moreover, it

recommends the ideal level at which the central bank should set its interest rate under different economic conditions. By using the Taylor Rule, the interest rate is determined according to the following factors that indicate the state of the economy:

i.   actual inflation relative to target level;

ii. economic activity and its "full employment" level; and

iii. the level of interest rate consistent with full employment (Huston & Spencer 2005).

Based on a seminal paper, Taylor (1993) suggests a very specific and simple rule for monetary policy. His original formulation is shown in the following equation:

$$i_{t=}r^*+\pi_t+0.5(\pi_{t\text{-}}\pi^*)+0.5(y_t)$$

Where

$(i_t) =$ Central bank policy rate

$r^* =$ Equilibrium real interest rate

$\pi_t =$ Average inflation rate over the contemporaneous and prior three quarters

$\pi^* =$ Inflation target of the central bank

$y =$ Output gap (100 x (real GDP-potential GDP) / potential GDP)

Interpretation

The rule "recommends" a relatively high interest rate (that is, a tight monetary policy) under the following economic conditions:

i.   when inflation is above its target;

ii. if real GDP rises above potential GDP; and

iii. when the economy is above its full employment level (Kozicki 1999).

Furthermore, the rule "recommends" a relatively low interest rate (easy monetary policy) in the opposite situations, that is, when inflation is below the target or real GDP decreases below potential GDP (Kozicki 1999).

Moreover, under this rule, when output and inflation gaps are equal to zero, a central bank opts for a neutral policy rate. Therefore, the Taylor Rule sets the policy rate of interest as a function of the difference between the current rate of inflation and the target rate of inflation, the current output gap (the gap between actual and potential output), and the equilibrium real interest rate (Freedman 2001; Alexandre *et al.* 2002). However, experience shows that sometimes these goals are in conflict, that is, inflation may be above its target while the economy is below full employment such as in the case of stagflation. In such situations, the rule provides guidance to policy-makers on how to balance these competing considerations in setting an appropriate level for the interest rate. Moreover, the presence of both the inflation gap and output gap in the Taylor Rule indicates that the central bank not only cares about keeping inflation under control, but also about minimising business-cycle fluctuations of output around its potential.

As all targeters seek to take a forward-looking approach to policy formulation, inflation forecasts therefore play a vital role in inflation targeting (Bernanke & Woodford 1997). Hence, Svensson (1997) argues that inflation targeting is a forward-looking approach or "inflation forecast targeting". To this end, inflation targeting central banks have worked to strengthen their forecasting and modelling capabilities (Roger & Stone 2005). However, a question that may arise is whose forecast is used as an input to monetary-policy decisions, that is, forecasts of the committee or of the central bank staff (Blinder 2009). Nonetheless, under inflation forecast targeting, the central bank constructs quantitative projections of the expected future evolution of the economy based on the way in which it intends to control short-term interest rates.

Public discussion of those projections is a critical part of the way in which the bank justifies the conduct of policy to the public. The most striking examples are the Bank of England (BOE), Sweden Riksbank, Norway's Norges Bank and the Reserve Bank of New Zealand (RBNZ) which all conduct monetary policy on the basis of a procedure sometimes referred to as inflation-forecast targeting (Woodford 2007:3). In practice, inflation targeting usually involves targeting the conditional forecast of inflation, that is, the inflation rate expected to prevail in the future given recent available information, rather than the current inflation rate (Haldane 1998; Batini & Nelson 2001:892). Central banks need all available information relevant to inflation to accurately forecast future inflation, thus, a range of indicators that have a predictive power for inflation, including various measures of exchange rate stability (Orlowski 2008). Thus, the inflation-targeting framework acknowledges that there is no single economic indicator which can completely capture economic and financial conditions. Hence the primacy of inflation targeting entails that as soon as macroeconomic indicators suggest that inflationary pressures are starting to surface, the monetary authority should start a gradual policy tightening and vice versa (Sgherri 2008). As a result of the reliance of the inflation-targeting framework on information, it has become known as the "information-inclusive monetary-policy strategy" in which many variables (such as labour-market variables; import prices; producers' prices; the output gap; nominal and real interest rates; and nominal and real exchange rates) and not just the information contained in one or two main inflation variables (monetary aggregate and the exchange rate) are used for deciding the setting of policy instruments. This implies that inflation targeting is a "looks at everything strategy" (Bernanke *et al.,* 1999b:159; Smidkova & Hrncir 2000).

2.8   SUMMARY

Chapter Two focused on defining and explaining the concept of inflation targeting. It was found that there is a lack of consensus about the definition of inflation targeting, yet similarities between the existing definitions occurred. For example, various inflation-targeting definitions emphasise communication, transparency and accountability. However, inflation targeting as defined by various inflation-targeting literature such as that of Bernanke *et al.* (1999a), and Bernanke and Woodford (1997) is an effort by the central bank to restrain inflation within a certain range of values, while informing the public of its intentions. Thus, inflation targeting is a policy of announcing what the central bank is going to do and then doing it, or deciding on the inflation rate to target (which can either be a point or range), announcing or communicating it to the public and pursuing the inflation target.

Moreover, at the heart of the inflation-targeting framework is an announcement by the monetary authority of its quantitative point target (or range) for inflation that entails more than the announcement of a numerical target over a specific time horizon. Therefore, institutional commitment is also required, coupled with other requirements.

While these requirements are important, they are not, however, unique or should limit inflation targeting applicability. A key lesson based on the study in this chapter is that there is no unique way of implementing inflation targeting; and its application varies across countries. This is because inflation targeting is a creation of central banks.

Some varieties of the inflation-targeting policies were also described. Central banks decide which inflation targeting version to use, taking into account various factors

such as the uniqueness of the environment in which they operate, without sacrificing

main elements or features of the inflation-targeting framework.

CHAPTER THREE

THE CASE FOR AND AGAINST INFLATION TARGETING

3.1   INTRODUCTION

In the previous chapter, this study provided an overview of inflation targeting. In this chapter it seeks to evaluate the case for and against an inflation-targeting framework. Chapter Three is organised into five sections. Section 3.2 provides some rationale for adopting intermediate targeting framework for monetary policy; Section 3.3 provides some of the reasons for the shift to inflation targeting; Section 3.4 examines the case for inflation targeting; while Section 3.5 examines the case against inflation targeting; Section 3.6 presents counter-arguments to the case against inflation targeting; and Section 3.7 provides a summary of discussions.

3.2   RATIONALE FOR ADOPTING AN INTERMEDIATE TARGETING FRAMEWORK

According to Houben (2000:76), the adoption of an intermediate targeting framework involves the following five cardinal elements:

i.   a consistent forward-looking policy programme;

ii.   a preannounced target path for the chosen economic variable to guide monetary policy towards its end objectives;

iii.   an adherence to the chosen target under normal circumstances;

iv.   an explicit explanation of the policy process in the context of the target; and

v.   the acceptance of accountability for developments under the target variable.

However, almost as important as that which monetary policy should target, is that it targets a certain economic variable. Houben (2000:118) suggests that policy targeting should meet the following preconditions:

i.   it should be reasonably controllable;

ii.   related to the policy objective;

iii.   readily communicable to the general public;

iv.   statistically monitorable on a timely, frequent and reliable basis; and

v.   should precede developments in the policy objective.

Perhaps a question that remains to be answered is why central banks should target certain economic variables instead of using discretion in making policy decisions. To provide an answer to this question, one needs to look at the case for adopting a target in monetary policy. The case for adopting a target variable in the conduct of monetary policy is built on the following reasons:

i.   It creates a nominal anchor that guides inflation expectations and reduces uncertainty about monetary policy issues;

ii.   enhances consistency in policy-making and focuses monetary policy to the medium term;

iii.   it endorses interaction with the general public;

iv.   increases communication with the public on monetary-policy issues by the central bank;

v.   it reduces gratuitous pressures by clarifying what the monetary policy can and cannot achieve; and

vi.   it augments the transparency and comprehensibility of the monetary policy (Houben 2000:76).

3.3   REASONS FOR SHIFTING TO INFLATION TARGETING

Over the past two decades, about 25 countries moved away from conducting their monetary policies on the basis of intermediate targets such as the growth in monetary aggregates or exchange rates, and embraced the historically youngest monetary-policy regime, namely inflation targeting (Strum 2009; Simone 2001). Today, inflation targeting is a broadly accepted approach on which to base monetary policy, yet it was quite revolutionary in the early 1990s. It is seldom that the move to inflation targeting is attributed to a single factor or, to put it differently, the proximate cause of the shift to inflation targeting varies across countries. Hence, a number of factors, in some way or another, contributed to the shift to inflation targeting (Thornton 2009). Goncalves and Carvalho (2009), and Samimi and Motameni (2009) identify several factors or reasons that triggered the shift to the inflation-targeting framework including, among others, the following:

i.   countries with a history of high inflation want to give their monetary policies a solid and credible anchor;

ii.   concerns or dissatisfaction with their previous monetary-policy frameworks;

iii.   fundamental reform of economic policy;

iv.   central banks preferred adopting clear and transparent rules with respect to the goals of monetary policy, and, in that sense, can be held accountable for the success of monetary policy;

v.   to minimise the social and economic costs of high inflation;

vi.   inspiration by the success of countries that had adopted the inflation-targeting framework;

vii.   the impact of financial development and trade openness on monetary policy;

viii.   to fulfil the criteria of the EMU where the primary objective is price stability; and

ix.   the lack of better monetary-policy options.

Moreover, the set of inflation-targeting central banks is very heterogeneous and including industrialised and emerging-market economies from every continent. Tables 1A and 1B show both industrialised and emerging-market economies that are part of the inflation-targeting community.

Table 1A. Inflation-targeting adoption dates and targets: Industrialised countries

Country	Inflation-targeting adoption date	Target measure	Target range*	Point	Target type	Horizon
New Zealand	Mar. 1990	HCPI	1 - 3,0%	-	Range	Medium term
Canada	Feb. 1991	HCPI	+/- 1,0%	2,0%	Point	Six - eight quarters
The UK	Oct. 1992	HCPI	+/- 1,0%	2,0%	Point	At all times
Sweden	Jan. 1993	HCPI	+/-1,0%	2,0%	Point	2 - 3 years
Australia	Apr. 1993	HCPI	2 - 3,0%	-	Range	Business cycle
Iceland	Mar. 2001	HCPI	+/- 1,0%	2,5%	Point	Long term
Norway	Mar. 2001	HCPI	+/- 1,0%	2,5%	Point	Medium term

* A number preceded by (+/-) means is the tolerance level for a point in the point column. Source: Tuladhar (2005); Hu (2006); Hammond (2009); Truman (2003); Batini *et al*. (2006); Heenan *et al*. (2006); and The websites of the central banks.

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Table 1B. Inflation-targeting adoption dates and targets: Emerging-market economies

Country	Inflation-targeting adoption date	Target measure	Target range*	Point	Target type	Horizon
Israel	Jun. 1997	HCPI	1 - 3,0%	-	Range	Indefinite
The Czech Republic	Jan. 1998	HCPI	+/-1,0%	3,0%	Point	Multi-year
Poland	1999	HCPI	+/-1,0%	2,5%	Point	Multi-year
Brazil	Jun. 1999	HCPI	+/-2,0%	4,5%	Point	Yearly target
Chile	Sep. 1999	HCPI	+/-1,0%	3,0%	Point	24 - months
Colombia	Sep. 1999	HCPI	4,5 - 5,5%	-	Range	Yearly target
South Africa	Feb. 2000	HCPI**	3 - 6,0%	-	Range	On a continous basis
Thailand	May 2000	Core CPI	0 - 3,5%	-	Range	Eight quarters
South Korea	Apr. 1998	HCPI	0,5%	3,0%	Point	Three years
Mexico	Jan. 2001	HCPI	+/-1,0%	3,0%	Point	Medium term
Hungary	Jun. 2001	HCPI		3,0%	Point	Medium term
Peru	Jan. 2002	HCPI	+/-1,0%	2,0%	Point	At all times
The Philippines	Jan. 2002	HCPI	+/-1,0%	3,5%	Point	Two years
Indonesia	Jul. 2005	HCPI	+/-1,0%	4,5%	Point	Medium term
Romania	Aug. 2005	HCPI	+/-1,0%	3,5%	Point	Annual target for two years horizon
Turkey	Jan. 2006	HCPI	+/-3,0%	7,5%	Point	Multi years (Three years)
Ghana	May 2007	HCPI	0 - 8,0%	-	Range	18-24 months
Serbia	Jan. 2009	HCPI	8 -10,0%	-	Range	Medium term

*A number preceded by (+/-) means is the tolerance level for a point in the point column.

Source: Tuladhar (2005); Hu (2006); Hammond (2009); Truman (2003); and Batini *et al.* (2006).

** CPIX for metropolitan and other urban areas until the end of 2008; headline CPI for all urban areas thereafter.

The spread of inflation-targeting central banks has steadily been occurring since 1990. Figure 2 confirms the fact that, although industrialised countries previously dominated the list of inflation-targeting countries in the past decade, it is now apparent that more emerging-market economies have adopted inflation targeting as their monetary-policy frameworks. Thus, the new approach to monetary policy

gradually spread to emerging-market economies later in the decade while it seems not to be particularly popular among industrialised countries (Schmidt-Hebbel 2009). Some of the reasons for the unpopularity of the inflation-targeting framework in industrialised countries include the continuous erosion of monetary sovereignty in Europe as a result of gradual growth of the Euro Area and the big three central banks -- the Federal Reserve, The European Central Bank (ECB) and Bank of Japan (BOJ) -- have not adopted inflation targeting, at least not of the explicit sort favoured by the 25 countries included in this dissertation.

Figure 2: The spread of inflation-targeting countries

Source: Mishkin and Schmidt-Hebbel (2007); Rose (2007); and the websites of the central banks
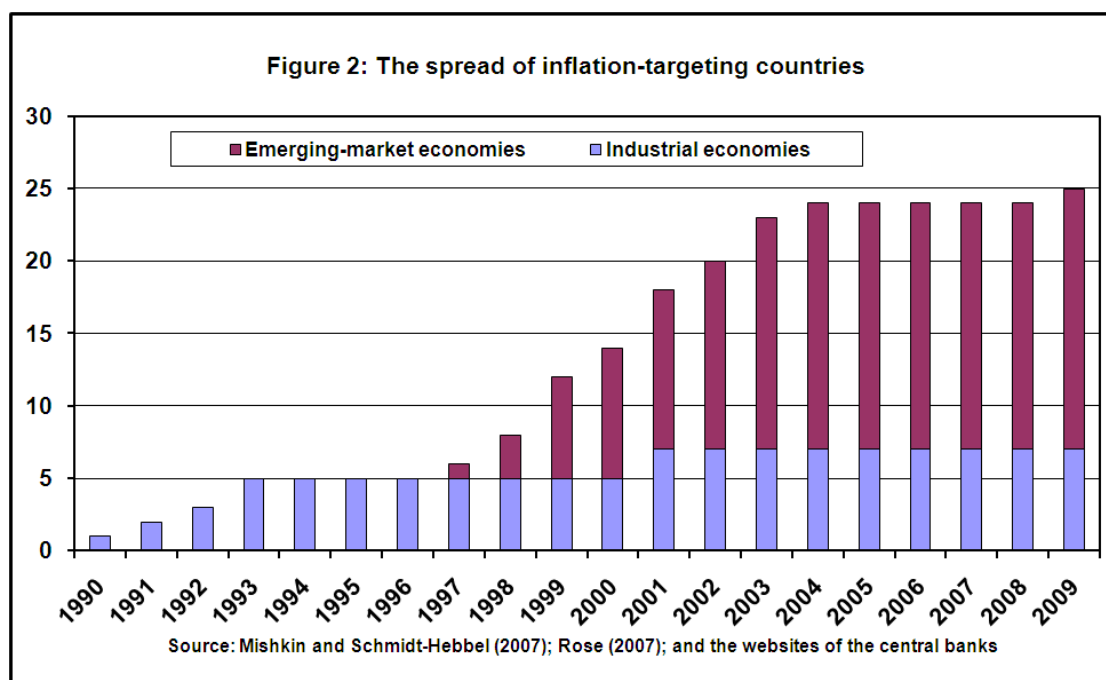
Although no country has abandoned the inflation-targeting framework owing to the inability to achieve the desired objectives of policy, the number of inflation-targeting countries is bound to change in the next few years. As a result, the list of inflation-targeting countries can never be final. Some will leave and others will join the inflation targeting group. Three countries that used inflation targeting (Finland, Spain and Slovakia) later went on to join the EMU in 1999 and 2009. Poland, the Czech

Republic and Hungary will possibly follow suit (Schmidt-Hebbel 2009). Other countries could adopt the inflation-targeting framework as well. In fact, a growing number of countries are currently considering doing so. Table 7 in the Appendix E section provides some of the prospective candidates for inflation targeting. Moreover, the jury is still out as to whether or not inflation targeting has passed the test of sustainability in the face of persistent shocks. Thus, the outlook for the spread of inflation targeting now seems likely to depend very much on how well the framework is perceived to have coped, first with the oil price shock, and subsequently with the global financial shocks. Preliminary evidence to date presented by Roger (2009), however, suggests that inflation-targeting countries have done better in minimising the inflationary impact of the surge in commodity prices in 2007.

Proponents of the inflation-targeting approach highlight many benefits of this monetary-policy framework. However, it is imperative to note that the mere adoption of an inflation-targeting framework does not guarantee that a country will reap its benefits. Other factors, such as the design and the implementation of the inflation target, influence the realisation of these benefits. Furthermore, inflation targeting has certain disadvantages, and its critics such as Atesoglu and Smithin (2006) have pointed to numerous disadvantages. Proponents of this framework, however, have tried to address many of these disadvantages by formulating counter-arguments in an attempt to defend the adoption of an inflation-targeting framework.

3.4   THE CASE FOR INFLATION TARGETING

Both Friedman (1968) and Phelps (1968) demonstrated that a permanently higher rate of inflation does not lead to higher economic growth and employment. Acceptance of this finding supported a move away from monetary policy to be used

as a tool for short-term demand management or fine-tuning to focus on the medium-term goal of price stability that lies at the heart of inflation targeting. Moreover, there has been an increasing recognition of the benefits of low and stable inflation and equally an awareness of the costs of inflation and low inflation as a social good. According to the inflation-targeting proponents, the best possible way to achieve low and stable inflation is through the adoption of the inflation-targeting framework. The argument in favour of low and stable inflation rests on four pillars that have been highlighted by Bernanke *et al.* (1999a), and Palley (2007:62):

i.   the inflation rate is the only macroeconomic variable that monetary policy can affect in the long run;

ii.   maintenance of a low and stable inflation rate is important for achieving other macroeconomic goals;

iii. the establishment of price stability provides a key element in policy-making; and

iv.   high inflation has an undesirable impact on economic growth and resources allocation.

Moreover, the consideration of inflation expectations in monetary-policy decisions or by policy-makers adds weight to the move towards a price-stability goal (Hammond 2009).

Nevertheless, the adoption of the inflation-targeting framework as a way of achieving price stability has been a hotly debated issue in economic and policy-making circles, and the debate remains unresolved. This is despite the emergence of a consensus in the 1980s on the harmful effects of inflation and economists' consensus that monetary policy should be primarily concerned with the pursuit of price stability. The main disagreement concerns how price stability can be achieved most effectively,

given several alternatives of conducting monetary policy. The case for the adoption of the inflation-targeting framework is, however, based on the following arguments:

First, the inflation-targeting framework allows a focus on domestic considerations and a response to shocks of both domestic and foreign origin (Mishkin & Savastano 2001). This means that inflation targeting preserves an independent monetary policy of a country so that the central bank can react to domestic shocks and help insulate the domestic economy from foreign shocks. Moreover, autonomous conduct of monetary policy, even in the world of continuing globalisation, financial innovation and liberalised capital flows is still possible under the inflation-targeting framework. Ball (1999:320) views this advantage as proof that the inflation-targeting framework should be viewed as a constrained discretion rather than a rigid rule.

Second, unlike monetary-aggregate targeting, the inflation-targeting framework is not dependent on a reliable relationship between a monetary aggregate and inflation (Mishkin 2001). This means that velocity shocks are largely irrelevant or not critical under the inflation-targeting framework. This is because the inflation-targeting framework is based on a broader approach to the causes of inflation, and acknowledges that it is caused by various factors such as commodities prices, wages, and the so forth. Hence, according to the inflation-targeting proponents, the battle of reducing and containing inflation can be won only if all available relevant information instead of just one variable is used in determining the best setting for monetary policy.

Third, inflation targeting has the key advantage that it is highly transparent and readily understood by the public. A well-understood target variable contributes to the visibility of the target variable (Svensson 2009a; Crowe & Meade 2007). Transparency under the inflation-targeting framework represents a considerable

change from the practice that existed well into the late 1980s when secrecy about the intentions of central banks was common practice and considered to be useful for maintaining their independence. Conventional wisdom during this period was that, to be effective about the real economy, policy decisions had to surprise economic agents (Jeanneau 2009). Nonetheless, the goal of most central banks nowadays is to inform the public about inflation that includes explaining the principles of their decision-making and the rule governing their monetary and political interventions (Smidkova & Hrncir 2000; Wagner 2000). However, transparency of a central bank can be defined as the existence of symmetric information between monetary policy-makers and other economic agents (Filho 2008). This pertains to all the different facets of policy-making. Moreover, it encompasses a considerable amount of information that a central bank provides to the public about its policy objectives, its outlook for the economy, and the actions needed to reach its objectives given the outlook for the economy and the relevance to the evaluation of monetary policy (Sellon 2008). Thus, transparency reduces uncertainty and improves the private-sector inference of the goals of the central banks. It further ensures more effective democratic accountability of the central banks and their officials by allowing private-sector agents to monitor or scrutinise the conduct of monetary policy and, if necessary, question or evaluate the policy analysis and actions of the authority that strengthen the incentives of the authorities to get their analysis or decisions right and achieve their stated objectives (Filho 2008). It also makes monetary policy more effective in a direct way by enabling the efficient management of private-sector expectations that helps to produce a desirable inflation outcome (Mishkin & Posen 1997). The transparency of the central bank can, however, be classified into five main categories.

i. Political transparency that pertains to the clarity of the legal mandate of the central banks;

ii.   Economic transparency that refers to the publication of the economic data, models and forecasts used by the central bank to arrive at its policy decisions;

iii. Procedural transparency that is the communication of the explicit policy strategy, as well as information on the decision-making process;

iv.   Policy transparency that includes the timely announcement and explanation of policy actions and some indication of likely future actions; and

v.   Operational transparency that refers to the discussion of economic disturbances and policy errors that are likely to affect the transmission of policy (Eijffinger & Geraats 2006).

The case for transparency is based on the fact that transparent policies are regarded to be clear, simpler, more predictable, and understandable to everyone. Policy changes are announced and the reasons for the policy changes are made explicit. This prevents the central banks from abusing their given authority or their decision-making independence (Svensson 2009a).

While central banks have become more transparent, central banks that opted for inflation targeting have taken a step further to improve the transparency of their monetary policy (Sellon 2008). Tables 3A and 3B (also see Table 6 on page **69**) provide some of the transparency measures taken by the central banks in both industrialised and emerging-market economies. Information presented in these reports make it relatively easy to monitor central bank performance. Moreover, the quality and results of the bank's analysis can be scrutinised by external experts and observers.

Table 3A. Transparency measures: Industrialised countries

Country	Inflation forecast	GDP forecast	Interest rate assumptions	Econometric model	Minutes	Votes
New Zealand	Yes	Yes	Endogenous	Yes	No	n/a
Canada	Yes	Yes	Endogenous	Yes	No	n/a
The UK	Yes	Yes	Market rates	Yes	Yes, after two weeks	Yes
Sweden	Yes	Yes	Exogenous	Yes	Yes, after two weeks	Yes
Australia	Yes	Yes	Constant cash rate	Yes	Yes, after two weeks	n/a
Iceland	Yes	Yes	Generated from macromodel	Yes	Yes	Balance of votes
Norway	Yes	Yes	Endogenous	Yes	No	n/a

Source: Fracasso *et al.* (2003); Hammond (2009); Mishkin (2004); and The websites of the central banks.

Table 3B.   Transparency measures: Emerging-market economies

Country	Inflation forecast	GDP forecast	Interest rate assumptions	Econometric model	Minutes	Votes
Israel	Yes	Yes	Forward looking policy reaction function	Yes	Yes, after two weeks	n/a
The Czech Republic	Yes	Yes	Endogenous	Yes	Yes, after eight days	Yes
Poland	Yes	Yes	Exogenous	Yes	Yes	Yes
Brazil	Yes	Yes	Constant	Yes	Yes, after eight days	Balance of votes
Chile	Yes	Yes	Endogenous	Yes	Yes, after two weeks	Yes
Colombia	Yes	Yes	Policy rule	No	Yes, after two weeks	Majority or unanimous
South Africa	**Yes**	**No**	**Exogenous**	**No**	**No**	**n/a**
Thailand	Yes	Yes	Exogenous	Yes	No	No
South Korea	Yes	Yes	Exogenous	Yes	Yes, after six weeks	No
Mexico	Yes	No	Endogenous	Yes	No	n/a
Hungary	Yes	Yes	Exogenous	Yes	Yes	Yes
Peru	Yes	Yes	Endogenous	Yes	No	No
The Philippines	Yes	Yes	Exogenous	Yes	Yes, after four weeks	No
Indonesia	Yes	Yes	Scenario and expected inflation	Yes	No	n/a
Romania	Yes	Yes	Endogenous	Yes	No	No
Turkey	Yes	Yes	Endogenous	Yes	Yes	No
Ghana	Yes	Yes	Not communicated	No	No	n/a
Serbia	Yes	No	Endogenous	No	No	No

Source: Fracasso *et al.* (2003); Hammond (2009); Mishkin (2004); and The websites of the central banks.

These publications contain detailed discussions of inflationary trends and their causes. They also discuss the prediction of inflation and explain why particular monetary-policy decisions have been made. However, there is no agreement

regarding the type and amount of information which central banks need to be transparent about (Morris & Shin 2002).

Fourth, the inflation-targeting framework reduces political pressures for time-inconsistent policy. An explicit numerical inflation target increases the accountability of the central bank, and reduces the likelihood of a time-inconsistent policy-making (Mishkin & Savastano 2001).

Fifth, inflation targeting strengthens the accountability of the central bank by increasing the costs of policy mistakes for policy-makers. Frisch and Staudinger (2002), and Schaechter *et al.* (2000) support this argument and conclude that inflation targeting greatly enhances the accountability and discipline of monetary policy, as well as fiscal policy. Improved accountability of the central banks leads to more consistent monetary-policy decisions; provides central bankers with protection against public criticism for unpopular actions; and protects the public from malfeasance of or irresponsible behaviour by the central bank (van der Merwe 2004). Practical evidence suggests that specific forms of accountability to parliament have been put in place in inflation-targeting countries, notably open letters and parliamentary hearings. Table 4 highlights which inflation-targeting central banks have these accountability mechanisms in place.

Table 4: The accountability measures of central banks

Country	Open letter	Parliamentary hearings
Australia	No	Yes, twice per year
Brazil	Yes	Yes, not regular
Canada	No	Yes, twice per year
Chile	No	Yes, three times per year
Colombia	No	Yes, twice per year
The Czech Republic	No	No, report
Ghana	No	No
Hungary	No	Yes, once per year
Iceland	No	Yes, twice per year
Indonesia	No	No
Israel	Yes	Yes
Mexico	No	Yes, not regular
New Zealand	Other	Yes, four times per year
Norway	No	Yes
Peru	No	Yes, once per year
The Philippines	Yes	No
Poland	No	No
Romania	No	No
Serbia	Yes	No
South Africa	**No**	**Yes, at least three per year**
South Korea	No	Yes
Sweden	No	Yes, twice per year
Thailand	Yes	No
Turkey	Yes	No
The UK	Yes	Yes, three times per year

Source: Hammond (2009) and The websites of the central banks.

Open letters are usually written by governors of the central bank on behalf of the MPC to the government in the case that inflation misses the inflation target by a pre-specified amount, while parliamentary hearings are whereby central banks appear before parliament to provide testimony on monetary policy. The recent experience of the BOE and Central Bank of the Republic of Turkey provides good examples in the case of open letters. The governors of both these central banks were forced to write open letters to the governments to explain the reasons for missing inflation targets, and submit their intentions to rectify this problem (Edward 2009). From the

explanations provided by central banks, the public understand the basis of monetary policy and arrive at accurate expectations (Casteleijn 1999:42). However, there are other accountability mechanisms that hold the governor or MPC accountable to the Board of the central bank, and the central bank is ultimately accountable to the public, which is usually achieved through publications and a wider communication strategy (Hammond 2009). For example, the strongest case of the accountability of a central bank in an inflation-targeting framework is that of New Zealand where the tenure of the governor of the central bank is linked to target achievement (Mishkin & Savastano 2001).

Sixth, the inflation-targeting approach focuses more on communication with the political authorities, financial markets, government, and the general public (Walsh 2009). Tables 5A and 5B indicate some of the communication vehicles adopted by inflation-targeting countries.

Table 5A. Communication vehicles of inflation targeters: Industrialised countries

Country	Announce monetary policy via press release/conference	Inflation/monetary policy reports	Other means of communications
New Zealand	Yes, press release	Yes, quarterly	Publish research and public presentations
Canada	Yes, press release	Yes, quarterly	Publish research and public presentations
The UK	Yes, press release	Yes, quarterly	Publish research and public presentations
Sweden	Yes, press release	Yes, quarterly	Publish research and public presentations
Australia	Yes, press release	Yes, quarterly	Publish research and public presentations
Iceland	Yes, press release and press conference	Yes, quarterly	Publish research and public presentations
Norway	Yes, press release and press conference	Yes, 3 per year	Publish research and public presentations

Source: Schaechter *et al.* (2000); Hammond (2009); Tuladhar (2005); Heenan *et al.* (2006); and The websites of the central banks.

Table 5B. Communication vehicles of inflation targeters: Emerging-market countries

Country	Announce monetary policy via press release/conference	Inflation/monetary policy reports	Other means of communications
Israel	Yes, press release	Yes, quarterly	Publish research and public presentations
The Czech Republic	Yes, press conference	Yes, quarterly	Publish research and public presentations
Poland	Yes, press conference	Yes, quarterly	Publish research and public presentations
Brazil	Yes, press release	Yes, quarterly	Publish research and public presentations
Chile	Yes, press release	Yes, 3 per year	Publish research and public presentations
Colombia	Yes, press release	Yes, quarterly	Publish research and public presentations
South Africa	**Yes, press conference and press release**	**Yes, semi-annual**	**Publish research and public presentations**
Thailand	Yes, press conference and press release	Yes, quarterly	Publish research and public presentations
South Korea	Yes, press conference and press release	Yes, semi-annual	Publish research and public presentations
Mexico	Yes, press release	Yes, quarterly	Publish research and public presentations
Hungary	Yes, press conference	Yes, quarterly	Publish research and public presentations
Peru	Yes, teleconference	Yes, quarterly	Publish research and public presentations
The Philippines	Yes, press release	Yes, quarterly	Publish research and public presentations
Indonesia	Yes, press release	Yes, quarterly	Publish research and public presentations
Romania	Yes, press release	Yes, quarterly	Publish research and public presentations
Turkey	Yes, press release	Yes, quarterly	Publish research and public presentations
Ghana	Yes, press conference and press release	Yes, quarterly	Publish research and public presentations
Serbia	Yes, press conference and press release	Yes, quarterly	Publish research and public presentations

Source: Tuladhar (2005); Hammond (2009); Heenan *et al.* (2006); and The websites of the central banks.

These exercises in communication are considered to be important to keep the general public, the financial markets, and the politicians constantly informed about the following:

i.   the goals and limitations of monetary policy;

ii.   the rationale for inflation targets;

iii.   the numerical values of the inflation target and how they were determined;

iv.   given the current economic conditions, how the inflation targets are to be achieved; and

v.   the reasons for any deviations from targets (Goodhart 1998).

This public-outreach exercise has been taken a step further under the inflation-targeting framework in that central banks do not only embark on a public information campaign, but various tools are used by inflation-targeting central banks in their efforts to boost their communication to the public. These include the *Inflation Report*, annual reports, inflation forecasts, press releases, press briefings, speeches, website information, brochures, econometric models, voting records, the release of the minutes of the meetings of the MPC, and articles in the publications of the central bank that are issued to explain to the public the conduct of monetary policy under the inflation-targeting framework (Fracasso *et al.* 2003). Table 6 focuses on the *Inflation Report*, indicating the size, frequency and first publication date of this report in inflation-targeting countries.

Table 6. Inflation reports among inflation-targeting central banks

Country	Inflation-targeting adoption date	Title	Inflation report	Frequency	Length (approx.)
Australia	Apr. 1993	Statement on Monetary Policy	May 1997	Quarterly	50
Brazil	Jun. 1999	Inflation Report	July 1999	Quarterly	150
Canada	Feb. 1991	Monetary Policy Report	May 1995	Quarterly	30
Chile	Sep. 1999	Monetary Policy Report	May 2000	3 per year	100
Colombia	Sep. 1999	Report to the Congress	Jan 1999	Quarterly	100
The Czech Republic	Jan. 1998	Inflation Report	Apr 1998	Quarterly	50
Hungary	Jun. 2001	Quarterly Report on inflation	Nov 1998	Quarterly	50 - 100
Iceland	Mar. 2000	Monetary Bulletin	Nov 1999	Quarterly	50
Israel	Jun. 1997	Monetary Policy Report	Feb 1998	Quarterly	50
South Korea	Apr. 1998	Monetary Policy Report	1998	Semi-annual	150
Mexico	Jan. 2001	Inflation Report	Mar 1999	Quarterly	100
Indonesia	Jul. 2005	Monetary Policy Report	2005	Quarterly	30 - 40
New Zealand	Mar. 1990	Monetary Policy Statement	April 1990	Quarterly	50
Norway	Mar. 2001	Inflation Report	Mar 1996	3 per year	50
Peru	Jan. 2002	Inflation Report	Jun 2002	Quarterly	35
Romania	Aug. 2005	Inflation Report	2005	Quarterly	50 - 60
The Philippines	Jan. 2002	Inflation Report	Sep 2001	Quarterly	50
Poland	1999	Inflation Report	1995	Quarterly	100
South Africa	**Feb. 2000**	**Monetary Policy Review**	**Mar 2001**	**Semi-annual**	**30**
Sweden	Jan. 1993	Monetary Policy Report	Oct 1993	3 per year	100
Thailand	May 2000	Inflation Report	Jul 2000	Quarterly	100
Turkey	Jan. 2006	Inflation Report	2006	Quarterly	60 - 80
Ghana	May 2007	Monetary Policy Report	Jul 2006	Quarterly	
Serbia	Jan. 2009	Inflation Report	Jul 2006	Quarterly	40 - 50
The UK	Oct. 1992	Inflation Report	Mar 1993	Quarterly	60 - 70

Source: Roger and Stone (2005); Schaechter *et al.* (2000); Hammond (2009); Fracasso *et al.* (2003); and The websites of the central banks.

This document presents the interpretation of current economic conditions of the central banks; the outlook for the economy and the associated risks; the reasons for policy decisions; the strategy that guides those decisions; and the outlook for future policy, given the objectives of the central bank and the economic outlook (Faust & Svensson 2002). Moreover, this publication serves the goal of anchoring inflation expectations in several ways:

i.   It ensures that the policy commitment of the central bank is verifiable by allowing the public to see at frequent intervals that the policy is still being conducted in a manner consistent with that commitment.

ii. It sharpens expectations about the likely future conduct of policy by allowing people to observe how the central bank processes and responds to developments of various types.

iii. The publication of the bank's own view of the future outlook for inflation can directly influence expectations (Woodford 2007).

Therefore, the *Inflation Report* serves as a pedagogical instrument to explain monetary policy to society at large.

Rochon and Rossi (2006) provide the seventh advantage of the inflation-targeting framework, namely that it provides an anchor that can limit political pressure, or a co-ordination device for inflation expectations that should translate to less volatile inflation and output. Thus, the inflation-targeting strategy provides an essential nominal anchor where other more familiar guideposts have become unreliable (Sherwin 2000:7). The belief is that with inflation expectations more firmly anchored by the inflation target, there is less of a tendency for inflation shocks to propagate through wage-and price-setting behaviour. However, to influence future price and wage settings by enterprises and trade unions, inflation targets have to be credible

(van der Merwe 2004). Thus, if inflation targets are perceived to be credible, they form the basis for future price and wage settings, thereby anchoring inflation expectations. However, evidence suggests that credibility is achieved the hard way, that is, it has to be earned, through a reputation of low inflation and appropriate monetary-policy actions, not commanded (Faust & Svensson 2002).

The eighth advantage is that inflation targeting provides a yardstick against which the performance of a central bank can be easily measured or monitored because the reason is that the evaluation and performance of a central bank are unambiguous as the target is either reached or missed since clear targets are set that the central bank has to meet. If the actual inflation rate deviates from these targets, the central bank has to explain what went wrong. Thus, there is no ambiguity about the conduct of monetary policy that disciplines the central bank and leads to a better understanding on the part of the public as to why monetary-policy decisions are made (Rochon & Rossi 2006).

Mboweni (1999) highlights the ninth and tenth advantages of an inflation-targeting strategy, namely improved monetary and fiscal policy co-ordination, provided that the target is consistent with other objectives, and the enhanced credibility of the monetary policy or the central bank. Mboweni (1999) argues that the joint setting of inflation targets strengthens policy co-ordination between the government and the central bank (see Tables 2A and 2B on page 37 to 38 regarding the target-setting practice of the inflation-targeting countries). Thus, policy co-ordination reduces tension between government and the central bank as both parties publicly commit themselves to the achievement of the same inflation target (Mboweni 1999). Policy co-ordination enhances the credibility of inflation targets as economic agents believe that inflation targets are feasible or desirable (van der Merwe 2004).

The eleventh advantage of the inflation-targeting strategy is that it is considered to be helpful in absorbing the effects of inflationary shocks. The devaluation of the pound sterling of the United Kingdom (UK) after the departure from the ERM provides a very valuable lesson in this regard (Debelle *et al.* 1998).

The twelfth advantage of the inflation-targeting framework is the sharpening of lag recognition. The forward-looking nature of inflation targeting forces policy-makers to explicitly recognise lags in the impact of the operation of the central bank (Haldane 1998). This recognition forces central banks to operate on the understanding that their policy actions may take by up to 12 months before the effects are fully felt in the economy. This enhances greater financial stability as policy-makers will not be too obsessed to respond to current developments.

The thirteenth advantage of inflation targeting is its medium term focus on inflation targets. This is consistent with the relatively long lag between monetary-policy measures and their effects on inflation.

Fourteenth, inflation targeting helps to motivate for institutional reform of the central bank, as well as to provide a momentum for structural reforms more generally, especially in the context of disinflation (Schaechter *et al.* 2000). However, what is the case against the inflation-targeting framework?

3.5 THE CASE AGAINST INFLATION TARGETING

Although the discussion of the inflation-targeting framework appears to focus on the advantages, the framework is not without problems, and criticisms of inflation

targeting are broad ranging. Critics have noted several disadvantages of inflation targeting that include the following:

First, the inflation-targeting framework is perceived to be too rigid or inflexible. Usually, this is taken to mean that the adoption of an inflation target will force the central banks to pay attention to inflation only, to the exclusion of output stabilisation and, potentially, other objectives such as financial stability, employment, and economic growth. As a result, most opposition to inflation targeting can be traced to a concern that other goals of a macroeconomic policy will be neglected if the central bank were to adopt inflation targeting (Bean 1999). This is most certainly the reason behind much of the opposition to formal inflation targeting in the USA, where inflation targeting is viewed as inconsistent with the dual mandate for low inflation and maximum sustainable employment of the Federal Reserve Bank (Walsh 2009; Hetzel 2007). Critics of the inflation-targeting framework such as Friedman and Kuttner (1996), and Kohn (2004) argue that this strategy imposes a rigid rule on the monetary authorities that does not allow them enough discretion to respond to unforeseen circumstances. As a result of these criticisms, the inflation-targeting framework is sometimes referred to as a 'one-step approach'.

Second, Buiter (2006) moves in the opposite direction. He criticises the inflation-targeting framework on the basis that it allows too much discretion to monetary policy-making in countries with a weak institutional environment, as may be the case in some emerging-market economies, which results in an undesirable outcome.

Third, critics argue that the inflation-targeting framework increases output volatility or instability, especially if monetary authority adheres tightly to its target in the face of supply shocks. The fact that there is too much focus on lowering inflation, to the exclusion of other goals, may exacerbate output instability (Walsh 1999).

Fourth, inflation targeting produces weak central bank accountability. This argument is based on the fact that the central bank is accountable only for factors that are under its control. In this case, experience teaches that there are many factors beyond the control of the central banks. A myriad of factors outside the domain of monetary policy include commodity prices, nominal wages, administered prices and consumer taxes. Moreover, imperfect control of inflation by the central bank exacerbates the accountability of a weak central bank (as argued) by making implementation and monitoring of the inflation-targeting framework difficult, which may result in many potential benefits of this strategy not materialising. Inflation control is imperfect due to various factors such as the long lags from the monetary-policy instruments to the inflation outcome; the state of the economy; future shocks to the economy; the influence of factors other than monetary policy or inflation; and to the errors of inflation forecasting due to a limited ability to forecast inflation accurately (Lomax 2005; Houben 2000; Rudebusch & Walsh 1998).

Fifth, the exchange-rate flexibility required under inflation targeting could cause financial instability. This argument is based on the possibility of exchange-rate shocks that may occur in the liberalised, foreign-exchange markets (Wagner 2000).

Sixth, inflation targeting can increase exchange-rate volatility as it could imply that the central banks that are run by an inflation-targeting regime have to neglect the exchange rate as they cannot simultaneously target both the inflation and the exchange rate.

Seventh, Mboweni (1999) criticises the inflation-targeting approach by arguing that it is too complicated to implement. It requires expertise that may not be available in many emerging-market economies. For example, heavy reliance on inflation forecasts may pose serious challenges to the implementation of the inflation-

targeting strategy in emerging-market economies as the lack of proper skills, infrastructure, and quality data to forecast inflation may lead to many forecasting errors.

Eighth, the appropriate rate and measure of inflation is criticised. Smith (2005) and White (2007) highlight that there is no consensus on the rate and measure of the inflation to target. Both low and high inflation targets exist among inflation-targeting countries, while there is a variation in the measures of the terms used in formulating the inflation targets. The recent global financial crisis revived this criticism. Many critics of inflation targeting argued that the current global crisis was partly caused by inflation targeting. As a result, critics recommend that inflation targets should be adjusted upwards.

The ninth criticism rests on the fact that inflation targeting typically focuses on consumer-price inflation, which either excludes or gives a very low weighting to asset-price growth. As long as consumer inflation remains within the target, central banks can keep interest rates stable, or lower them when inflation drops too low. The paradox is that the more a central bank succeeds in keeping inflation and the interest rates low, the more asset-price bubbles are likely to build up (Bernanke & Gertler 2001).

The tenth criticism cited by Paulin (2000), and Bernanke and Woodford (1997) follow from the empirical observation that inflation responds to changes in monetary policy only with a substantial lag, from one to two years. This lack of quick feedback from the economy to policy implies two related problems. Primarily, the information required by the inflation-targeting central bank to implement inflation targeting is much greater than the information needed to target intermediate variables whose response to policy changes can be observed with less delay. Secondarily, it is

difficult for the inflation-targeting central bank to tell whether it is on track and, as a result, it is difficult for the public and the financial markets to make any judgement that has potentially adverse consequences for the accountability and credibility of the central bank.

The eleventh disadvantage of an inflation-targeting framework is that its proponents regard inflation always as a strictly demand-determined phenomenon. Hence, the underlying process for the transmission mechanisms remains the same as in the demand-pull view of inflation. With regard to the cost-push inflation, the inflation-targeting strategy generally either ignores this phenomenon, or takes the view that it should be accommodated, arguing that supply shocks are either transitory in nature, that is, they come and go or will cancel one another out as a random walk and, on average, are zero and do not affect the rate of inflation (Truman 2003). The emphasis is therefore strictly placed on demand, and more specifically on the output gap. Moreover, the interest rate is the key as long as the market rates of interest are set equal to the natural rate, when the output gap will be nil and inflation will be tamed. Thus, when setting the inflation-targeting strategy, costs are present, but the output is a sufficient statistic for the effect of real activity on inflation. Moreover, any inflation-forecasting models based on demand considerations are likely to be ineffective and may lead to wrong policy interventions that raise the following question: Why implement a demand-targeting solution when the problem is one on the supply side? (Rochon & Rossi 2006; Rogoff 1985).

Twelfth, criticism of inflation targeting is its inability to reduce the sacrifice ratio, that is, the unemployment costs of fighting inflation (Epstein 2003).

Thirteenth, Kuttner (2004) rejects the inflation-targeting framework benefits and argues that they do not work. This is argued to be the case based on the fact that

economic performances of inflation targeters are indistinguishable from those of comparable non-inflation targeters. The short period during which the track records of inflation targeters can be evaluated has also exacerbated the situation, and heightens this argument.

Fourteenth, the adoption of the inflation target requires co-operation in respect of setting administered prices that might be problematic at times. Co-operation in respect of aligning the adjustments in administered prices with the target range is therefore important and any misalignment might place the target in jeopardy. However, what are the views of advocates for inflation targeting on these criticisms?

3.6   COUNTER-ARGUMENTS TO THE CRITICISM OF INFLATION TARGETING

According to Seidman (2006) and Saxton (1997), the criticisms discussed above are based on serious misconceptions about the inflation-targeting framework. Consequently, proponents of the inflation-targeting framework provided the following counter-arguments to some of them:

First, according to the proponents of inflation targeting, the inflation-targeting framework is far from being a rigid rule in practice. Truman (2003) indicates that the simple rules included in the inflation-targeting framework fall far short of completely specifying the behaviour of the central bank, while Kuttner (2004) asks to which type of rule it amounts. This is because the discretion of the inflation-targeting framework in practice is not absolute, and is constrained to an important degree by how well inflation expectations are anchored, as well as the structure of the economy. Moreover, the inflation-targeting framework provides guidelines instead of

prescriptions on how the central banks should conduct their monetary policy (Kuttner 2004). As a result, Mishkin (2000) refers to the inflation-targeting framework as a "constrained discretion".

Second, criticism that the inflation-targeting framework provides central banks with too much discretion is countered by the argument that such discretion is normally constrained by the increased transparency and accountability of the central bank. Moreover, the scope of making systematic policy mistakes is believed to be constrained or reduced due to the high price to be paid by a central bank that engages in irresponsible policy behaviour (Mishkin 2001).

Third, the proponents of inflation targeting counter the argument of too much focus on inflation at the expense of other policy goals by indicating that the inflation-targeting framework does not require an exclusive focus on inflation, but instead makes inflation the primary goal of monetary policy (Mishkin 2000). Thus, although the primary goal of monetary policy is inflation, this does not preclude the consideration of other macroeconomic goals such as economic growth and employment creation by central banks (Davidson 2006; Orphanides & Wieland 2000). Moreover, contrary to this belief, existing literature suggests that inflation targeting instead helps to improve the environment for long-run growth. Jensen (2002) and Bernanke (2003a) highlight different inflation-targeting practices in their attempts to clarify this misunderstanding, namely strict inflation targeters (also known as inflation-nutters or tough talkers), and flexible inflation targeters (also known as a hierarchical or a dual mandate). This distinction is argued to be significant in this debate due to the fact that even though the central banks talk about strict inflation targeting, no central bank has come close in practising it, or strict inflation targeting has been without significant practical relevance (Batini *et al.* 2006; Kahn & Farrell 2002). Critics are in this case referred to what central banks do rather than what they

say, that is, there are no "inflation nutters" heading the central banks in the real world who focused on achieving their inflation targets regardless of the negative consequences on the economy (King 1997; Poole 2006; Lima & Setterfield 2008). In practice, all central banks have adopted a flexible approach to inflation targeting, and concede that there are situations in which complete price stabilisation is inappropriate, such as when cost-push shocks happen (Roger & Stone 2005; Parrado 2004). This is reflected in the fact that the central banks aim at achieving their inflation objectives over a medium-term horizon that suggests that other objectives are being accorded at least some weight, and take the position that any miss in achieving one target will only be rectified gradually, over time. It may not be a simple task, however, for an outside observer to evaluate these relative weights. Moreover, some element of flexibility has been included in the design of the inflation-targeting framework as a way of accommodating other monetary-policy goals except inflation (Bernanke 2003c; Kuttner 2004). Moreover, any central bank that attempts to achieve inflation at all costs runs the risk of losing its independence. Svensson (2009b) suggests that an independent central bank that always and exclusively focuses on price stability, is likely to lose its independence. This is because governments in democracies are accountable to the electorate and, as such, are justified in feeling they have the right to exert some influence over monetary policy.

Critics of inflation targeting, such as Bell (1999), who vigorously opposes the inflation-targeting strategy does so because he assigns full responsibility to the goals of the central bank to promote full employment and economic growth. In the modern context, however, the rate of unemployment is minimised by an economy that operates as productively as possible. Moreover, it can be reduced by measures that directly affect incentives and conditions in the labour market itself. This is a sphere in which government is actively involved by creating long-term interventions such as increasing skills; investing in economic infrastructure; labour laws; educational

standards; and social policies and leadership that are committed to economic growth and broader development (Bleaney 1991). It is clear that these factors have nothing to do with the operation of the monetary policy of a central bank. As a result, on the one hand, the unemployment rate is a problem for which monetary policy is irrelevant, and any attempt by central banks to keep unemployment below the natural rate will lead to higher, accelerating inflation and inflation expectations without reducing the unemployment rate (Johnson 1999; Moskow 2006). On the other hand, the solution for higher economic growth is a range of real variables such as labour productivity and other supply-side factors that include better government policies; and a general economic environment to which monetary policy contributes; the quantity and productivity of labour, capital, land and infrastructure in the economy; as well as the general regulatory environment, including the efficiency of the government and the judicial system. External factors such as the terms of trade are also relevant (Tatom 1985). Furthermore, countries with sustained economic growth have shown that it is productivity improvements that improve living standards, not monetary policy as some politicians would like people to believe (Smithin 2002).

Third, inflation targeting has been criticised for its heavy reliance on forecasts that are considered problematic. However, Jansen (2001) argues that, as all forecasts, the inflation forecast is uncertain and is used as an input into the decision-making process, not as an end in itself. Moreover, Woodford (2007) highlights that it is even more possible that the inflation forecast can be inaccurate. This is because there is uncertainty about the future state of the economy; the transmission mechanism between the monetary policy instrument and the outcomes, and shocks that may occur. Thus, forecasts should not be regarded as self-prophecy of the central banks.

Fourth, the availability of a different target measure under the inflation-targeting framework has been largely criticised. However, the choice of index involves a trade-

off of inflation controllability and the ability to influence expectations. Any attempt to use a common measure such as the CPI, which is entrenched in public perception, will have a greater ability to influence expectations than in the case of an artificial index over which the authorities may well have greater control, but the effect on inflationary expectations is not as good as with a common index. An artificial index has the ability to influence expectations when the bank has pre-established credibility, which is usually not the case in emerging-market economies. However, when the measure has significant exclusions, such as a core CPI, inflation can be easily controlled and enhances the possibility of the central bank reaching the target.

Fifth, some critics argue that inflation targeting has the potential to lead to deflation, that is, a persistent fall in price level. However, the experience of deflation in Japan may instead add weight to the usefulness of the inflation-targeting strategy. This is because undershooting the inflation target point or targeted band is as serious as overshooting the target point or target band (Dodge 2005). Maybe Japan could have avoided its deflation problem if it had been part of the inflation-targeting countries, or if it were to have followed Bernanke's advice to either adopt inflation targeting or a rising target for the price index as a weapon to counter deflation. Thus, setting an explicit target for inflation is a deflation-fighting strategy (Posen 2008).

Sixth, some critics argue that inflation targeting has the potential to lead to the loss of central bank credibility. This is argued to be the case due to the fact that inflation is influenced by many factors. Some of these factors are outside the domain of monetary policy and monetary authority will be pursuing outcomes it does not fully control. However, practical experience suggests that this difficulty can be addressed by using the escape clause, presenting the inflation targets as a range and publishing inflation forecasts as a probability distribution rather than as a single rate (Houben 2000).

3.7   SUMMARY

Based on the case for and against the inflation-targeting framework, Chapter Three illustrated that, potentially, inflation targeting has strong advantages (Arestis *et al.* 2002). The provision of a nominal anchor for inflationary expectations, along with the effects of credibility and transparency, are undeniably important advantages of the inflation-targeting framework. However, various shortcomings also exist within this framework that can complicate the framework and cause potential advantages to be outweighed. Factors such as the exchange-rate flexibility, information requirements, the ability to forecast inflation, as well as the role of administered prices and cumbersome implementation processes are prime examples in this case. However, the case for the inflation-targeting strategy outweighs the case against this framework, suggesting that inflation targeting is a superior monetary-policy framework when compared to other monetary-policy regimes and promises to continue delivering better macroeconomic results. In fact, the inflation-targeting framework has been instrumental in taming inflation and stabilising the economy, and appears to have gained considerable credibility over time in a number of countries (Sgherri 2008). Nevertheless, price stability is not sufficient to ensure a stable and balanced economy. For it to work best, central banks need to maintain a flexible approach to monetary policy. Nonetheless, inflation targeting has supported, but not guaranteed, macroeconomic stability.

CHAPTER FOUR

ALTERNATIVE MONETARY-POLICY FRAMEWORKS

4.1   INTRODUCTION

This chapter seeks to investigate if there are reasonable alternatives to inflation targeting, and sheds some light on the question as to why other monetary-policy frameworks have been abandoned in favour of an inflation-targeting framework. The chapter is organised into two sections: Section 4.2 discusses alternative monetary-policy frameworks and provides their advantages and disadvantages; while Section 4.3 summarises the discussions in this chapter.

4.2   ALTERNATIVE MONETARY-POLICY FRAMEWORKS

One of the oldest debates in monetary economics concerns the appropriate target for monetary policy. Practical experience shows a lack of consensus among monetary-policy theorists on the best strategy to achieve low inflation. The quest for an appropriate monetary-policy strategy has persistently drawn the attention of economists and politicians alike. Mishkin (1999) highlights various factors that can influence the choice of a monetary-policy strategy, including, but not limited to the following:

   i.   the form of the government system;
  ii.   economic and legal systems;
 iii.   the level of expertise in monetary policy matters that exist both inside and
         outside the central bank;

iv.   the policy history of a country;

v.   the analytical capacities of a central bank; and

vi.   institutional arrangements and structure of the financial sector.

The main reason for the emphasis on the optimal monetary-policy framework is both the belief and experience regarding the high costs of inflation as the welfare benefits of adequate monetary policies (Jonung 2002; Moreno & Rey 2006). Moreover, the costs of inflation are more serious than the costs of the non-attainment of other non-primary objectives (Mohr 1986; Fortin 2003; Lundbord & Sacklen 2006). Influential cross-country studies by Fischer (1993) and Barro (1995) found that inflation negatively affects economic growth. On the one hand, Fischer (1993) found that a ten percent point rise in inflation is correlated with a decline in the output growth of 0,4% per annum. On the other hand, Barro's (1995) statistical analysis provides further evidence in favour of lower inflation. His analysis of the effects of inflation on economic growth, drawn from the experience of more than 100 countries over 30 years, found that an increase in inflation rate of ten percent reduced economic growth by 0,2% to 0,3% per year. Although Hineline (2007) warns that Barro's findings were driven by the observations where inflation exceeded 20,0%, his findings are nonetheless still useful in modern macroeconomics. Moreover, studies by Cecchetti *et al.* (2006) and Thornton (2007) emphasise the need for lower inflation and price stability as the primary concern of monetary policy in our modern society. However, Bruno and Easterly (1998), and Bruno (1995) argue otherwise and question the logic of lowering inflation. According to these authors, lowering inflation comes at a cost of declining economic growth. As a result, some rate of inflation is actually good for economic growth or inflation does not harm economic growth. However, they fail to advice on the rate of inflation which will be beneficial to economic growth.

Monetary policy procedures have undergone significant modifications in reaction to changes in economic conditions. While policy procedures have changed, the formal long-run goals have not. Inflation remains the primary concerns of monetary policy, and the interest rate the main monetary-policy instrument, perhaps leading von Hagen (1999:682) to question whether monetary-policy strategies used to achieve low and sustainable inflation do matter after all, that is, whether exchange-rate targeting, monetary targeting, discretionary or inflation targeting are used as a monetary-policy framework. The main difference between monetary-policy regimes is whether the monetary policy is aimed directly at its final target of price stability or at an intermediate target, that is, what is their focus on different economic variables and ways to achieve low and stable inflation. For example, in exchange-rate targeting, the primary focus is on the exchange-rate level targeted, while in monetary targeting, the primary focus is on the targeted monetary aggregate. However, other macroeconomic variables are accommodated in the conduct of monetary policy despite the focus on certain economic variable (Bernanke *et al.* 1999a; Cabos *et al.* 2001). Even the most dedicated monetary targeters that are now part of the European Monetary Union (EMU) -- Germany and Switzerland -- were willing to meet other short-term objectives.

However, before discussing different monetary-policy regimes, it is indispensable to define monetary policy and a monetary-policy framework that are issues to which this chapter will now return.

4.2.1   Definition of monetary policy and monetary-policy frameworks

The history of monetary policy has been characterised by the search of methods to conduct monetary policy. Moreover, there are continuing debates on several issues

connected with monetary policy. These debates raised a number of questions on monetary policy. Such questions relates to the objectives, instrument and impact of monetary policy on the economy. Practical experience with monetary policy suggests that central banks are nowadays primarily agencies for monetary policy (Rangarajan 2001).

Defining monetary policy and its goals is not a simple exercise. However, it can perhaps best be defined as the measures taken by the monetary authorities to influence the quantity of money or the rate of interest to achieve stable prices, full employment and economic growth (Ragan 2006). However, another question on this topic that needs to be answered relates to whether monetary policy is a science or an art. The theory of monetary policy suggests that monetary policy is a science and its principal task is to provide an anchor for inflation (Walsh 2001; Zimmermann 2003). To conduct monetary policy, central banks choose the appropriate monetary-policy framework. Nonetheless, what is a monetary-policy framework? The following section attempts to address this question.

A monetary-policy framework serves as a means to achieve monetary policy objectives. In its most basic form, a monetary-policy framework comprises two methods, namely monetary policy based on rules, and monetary policy based on discretion (Bordo & Schwartz 1997; Tuma 2000). However, Bordo and Schwartz (1997) define monetary-policy framework as a set of monetary arrangements and institutions accompanied by a set of expectations by the public with respect to policy-makers' action and expectations by policy-makers about public's reaction to their actions. Monetary-policy frameworks are, however, constantly evolving in response to new developments in economic and financial markets. A certain theoretical framework may be *en vogue* for central banks around the world in one era, and out of favour in the next. A good example of this was the rise and fall of monetarisms in the

1980s. In the 1970s, monetary targeting was a popular monetary-policy framework adopted by several countries such as the United States, Canada and the United Kingdom. However, this framework was not successful in controlling inflation in these countries. By the early 1980s, it was very clear that the relationship between monetary aggregates, and inflation and nominal income had broken down and all three countries formally abandoned monetary targeting.

However, practical experience shows that central banks choose the most appropriate or suitable monetary-policy framework to fulfil its monetary-policy role from various available options. Moreover, a central bank that is realistic will also compare the informational requirements of the monetary-policy framework to decide which will work best in an uncertain world (Bomhoff 1992). Nevertheless, at the heart of the decision regarding policy framework is the notion of credibility (Wagner 2000; Siklos 1999).

4.2.2 Monetary-policy frameworks

However, basic monetary-policy frameworks include: exchange-rate targeting; monetary-aggregate targeting; interest-rate targeting, discretionary monetary policy; nominal-income targeting; and inflation targeting (Mishkin 1999; Mishkin 2007; Bernanke *et al.* 1999a). Each of these frameworks is now discussed separately.

4.2.2.1   *Exchange-rate targeting*

The first strategy with a long history used by central banks to achieve price stability is exchange-rate targeting. In literature, it is also called "rule-directed policy-making" (Kahveci & Sayilgan 2006). Calvo *et al.* (1995) define an exchange-rate targeting

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regime as a monetary-policy regime that places its primary focus on the level of the exchange rate. Such a regime aims to control the level of the exchange rate, and movements in the level of the exchange rate determine the stance of the monetary policy, that is, exchange rate is at the centre of macroeconomic policy. In many countries, the nominal exchange rate was often used as a nominal anchor to bring down inflation (Civcir & Akçağlayan 2010:339). It is usually practised in small, yet relatively open economies following the stabilisation of inflation when credibility is rather low (Wagner 2000). However, one should only resort to an exchange-rate targeting regime where the financial sector is not sufficiently developed to support an independent monetary policy. An exchange-rate targeting regime can, however, be practised following different arrangements and can take many forms (Strašek 1998:69). Calvo (2001) and Macfarlane (1999) highlight different types or arrangements of exchange-rate targeting regimes that include the following:

i.   fixed arrangements such as currency unions, currency boards and a fixed exchange rate;
ii.   intermediate arrangements such as an adjustable peg, a crawling peg, and a basket peg' and
iii. target-zone or band and floats arrangements such as managed and free floats.

It has long been recognised that even though a country has announced that it has adopted a particular exchage-rate framework, it may not necessarily be following policies that are compatible with it. The above-mentioned exchange rate arrangements represent the best known exchange rate forms (Genberg & Swoboda 2005:131). In recent years, however, an exchange-rate targeting policy implies the fixing or linking of the exchange rate of one country to another currency or basket of currencies of a neighbouring or major trading partner that is large, enjoys low inflation

or is committed to price stability, and provided that its currency is relatively stable (Wagner 2000). Therefore, any country that follows an exchange-rate targeting policy or regime will implicitly be following another policy, that is, policy followed by the country in respect of which the exchange rate is targeted. The value of the exchange rate remains unchanged within narrow limits except for a major shift in underlying conditions. Whenever a change in value is made, it occurs by official government action through either devaluation or revaluation. Moreover, exchange-rate targeting is based on the belief that it will import credibility of the anchored country, that is, if the exchange-rate target is credible or expected to be adhered to, it anchors inflation expectations to the inflation rate in the anchor country to which currency it is fixed (Grenville 2000; Erol & van Wijnbergen 1997). The announcement of an exchange-rate target is expected to provide the private sector with transparent information about the future inflation rate, at least in the short run (Bernanke *et al.* 1999a; Kahveci & Sayilgan 2006). It reflects a strong commitment to macroeconomic stabilisation since it can be controlled by the public daily and without delay. Moreover, exchange-rate targets are expected to exert a disciplinary effect on both monetary and fiscal policy (Obstfeld 1985). For international experience with this regime, see Mishkin (1999), Chang and Velasco (2000), and Mishkin and Savastano (2001).

Mishkin (1999), Houben (2000:90) and Bernanke *et al.* (1999a) highlight several advantages of an exchange-rate targeting framework.

First, the nominal anchor of an exchange-rate target directly fixes the inflation rate for internationally traded goods, and thus directly contributes to keeping inflation under control by containing the imported inflation of an open economy. Thus, the benefits of low inflation enjoyed by the anchor country are expected to spill over or be

transmitted to the exchange-rate targeting country. As a result, the exchange-rate targeting regime is more helpful in controlling inflation in open economies that largely depend on imports of goods than in relatively closed economies. Many emerging-market economies fall into this category (Ratti 2002).

Second, the exchange-rate targeting regime anchors inflation expectations to the inflation rate in the anchor country to which currency it is pegged, particularly when the exchange-rate target is credible. This is the case mostly if there are restrictions to capital movements. A serious commitment to an exchange-rate target implies that the exchange-rate targeting country has adopted a monetary policy of the anchor country (Mishkin 1998:83).

Third, an exchange-rate target provides an automatic rule for the conduct of monetary policy that helps mitigate the time-inconsistency problem where there are incentives for policy-makers to try to exploit the short-run trade-off between employment and inflation to pursue short-run employment objectives using an expansionary monetary policy (Mishkin & Westelius 2008). This is argued to be the case as central banks automatically respond to exchange-rate appreciation or depreciation without wasting time, and the public easily predicts their actions. Moreover, it is also argued that such a rule disciplines monetary policy not to accommodate other policy objectives such as employment gains, and ensures that central banks act timely to an exchange-rate depreciation or appreciation, thereby facilitating the achievement and maintenance of low inflation.

Fourth, an exchange-rate target has the advantage of simplicity and clarity that makes it easily understood by the public, owing to the basic nature of this approach. Financial markets report regularly on the success of this policy as the prevailing level of the exchange rate receives much media coverage. Moreover, the features of

simplicity and clarity enhance the exchange-rate regime's chances of getting public support for a strong national currency because the public knows the basic principles behind an exchange-rate targeting framework and would like to reap the benefits of a strong national currency (Mishkin 1999).

Fifth, an exchange-rate target is argued to help economic and political integration as in the case of the Exchange Rate Mechanism (ERM), which was in place in the EMU states prior to the introduction of the euro (Mishkin 1999).

Sixth, the exchange-rate targeting regime enhances co-operation between the government and the central bank. This is due to the exchange-rate target that is set by the monetary authorities, which include the government of a particular country. To this end, the government shares joint responsibility for the achievement of the target and cannot conduct policies that will put in jeopardy its achievements.

Seventh, exchange-rate targeting makes foreign finance available at a cheaper rate by reducing or eliminating the exchange-rate risk.

Eighth, in an open economy, success at exchange-rate stabilisation is a convenient means for assessing a commitment to low inflation. Many countries have used exchange-rate stabilisation to stabilise inflation and to confirm an inflation-fighting credibility. Thus, adoption of the exchange-rate targeting regime is seen by many researchers such as Frankel and Chinn (1995), and Herrendorf (1999), as a way of raising anti-inflation credibility. Obstfeld and Rogoff (1995) point out that most emerging-markets economies have made the exchange-rate stability the centrepiece of their inflation-stabilisation attempts.

Last, the straightforward nature and visibility of exchange-rate targets enhance transparency, thereby limiting the scope of time-inconsistency problem and contributing to anchoring inflation expectations (Mishkin 2007).

Despite the seemingly inherent advantages of exchange-rate targeting, it has serious drawbacks. International experience with an exchange-rate targeting framework has shown that serious problems can be caused by or linked to this framework. Houben (2000:93), Obstfeld and Rogoff (1995), and Mishkin (1999) excellently articulate several serious criticisms and weaknesses of an exchange-rate targeting regime, which include the following:

First, an exchange-rate targeting framework leads to the loss of an independent monetary policy, or weakens the autonomy of the monetary policy. Since the exchange-rate targeting ties the domestic currency to the currency of another country, the domestic country has to do what the partner country does, thereby restricting the ability of the central bank to respond to both domestic and external shocks. Thus, a monetary policy does not respond to domestic economic conditions and is indifferent to output growth and employment (Ratti 2002:679; Kahveci & Sayilgan 2006). However, the severity of this disadvantage depends on the extent to which economic developments and preferences differ with those in anchor country. As a result, an exchange-rate targeting regime is more appropriate to countries that cannot conduct their own monetary policy owing to factors such as the level of development of the country, and a lack of expertise in the conduct of a monetary policy. However, other policies such as fiscal policy can play a greater role in stabilising the economy. Handing over control of monetary policy to a foreign central bank not under the sway of any individual government may be an indirect way of gaining the benefits of central bank independence.

The loss of an independent monetary policy can be problematic, especially in the globalised environment that is characterised by the free flow of capital. The uniqueness of the macroeconomic problems affecting each country makes matters worse as the targeting country is unable to defend itself against domestic shocks that are not experienced by the anchor country. The targeting country also deprives itself of the opportunity to practise sound macroeconomic policy owing to the fact that any shocks in the anchor country are directly passed on to the targeting country, which then has to adopt a similar policy stance, that is, the macroeconomic problems affecting the anchor country dictate the monetary-policy action to be taken in the targeting country. Therefore, the anchor country is the leader, while the targeting country is merely a follower, which can be problematic at times. The problems after the reunification of Germany in 1990 are a striking example of the shortcomings in the leader-follower case in an exchange-rate targeting framework. The reunification of Germany directly transmitted interest-rate shocks to targeting countries that adjusted their interest rates to similar levels as those in Germany.

Rogoff *et al.* (2003:4) and Mishkin (1999), however, argue that emerging-market economies have more to gain and little to lose by adopting an exchange-rate targeting regime. According to them, the logic behind this argument is the lack of political and monetary institutions that enable the use of discretionary monetary policy. Emerging-market economies are therefore better off by targeting the currencies of countries such as the United States of America (USA) than pursuing their own independent monetary policies.

Second, exchange-rate targeting is suitable for small, open economies where the exchange rate is a significant determinant of domestic price developments. The exchange rate is relatively good as a nominal anchor in the case of capital flow regulation. The reduction in capital flow decreases the risk of exchange-rate

speculation and allows some other schemes of exchange autonomous monetary-policy regulation to be applied.

Third, an exchange-rate target forces the central bank to use monetary policy to keep the exchange rate on or within the target range. With such a goal in mind, domestic economic considerations will take second place in the application of monetary policy (Croce & Khan 2000; Stockman 1999).

Fourth, Mishkin (1999:582), and Kahveci and Sayilgan (2006) argue that an exchange-rate targeting regime removes the signal provided on a daily basis by the foreign-exchange market regarding the stance of monetary policy, that is, it postpones the identification of economic problems within the country in question. As a result, it does not give central banks the necessary flexibility to adapt to the changing financial markets. Furthermore, the lack of an exchange-rate signal is considered to weaken the accountability of the central banks, particularly in emerging-market countries, which makes it difficult to measure policy actions of the central banks. The currency crisis in Thailand has been cited as a good example in this regard. A currency crisis is defined as a speculative attack on a country's currency that can result in a forced devaluation and possible debt default (Chiodo & Owyang 2002:7). Thailand currency crisis occurred in 1997 with the financial collapse of the Thai baht caused by the decision of the Thai government to float the baht and abandoning its peg to the USA dollar. However, this crisis spread to Asia and around the world, leading to the Asian financial crisis (van Horen *et al.* 2006:374).

Fifth, an exchange-rate targeting regime leaves countries open to speculative attacks on their currencies by market participants taking a view that the central bank will not be able to buy or sell sufficient quantities of foreign exchange to protect the peg at the chosen level (Jadresic *et al.* 2001 & Mishkin 1998:98). Therefore, exchange-rate

targeting promotes financial fragility and possibly a full-fledged financial crisis that can be destructive to an economy. Calvo and Mishkin (2003) highlight a series of financial crises that were widely perceived to be caused by an unsustainable exchange-rate targeting framework including the following:

i.   The ERM crisis of 1992

The European Exchange Rate Mechanism (ERM) is a system introduced by the European Community in March 1979, as part of the European Monetary System (EMS). The aims of the ERM were fourfold:

i.   first, to reduce exchange-rate variability;

ii.   second, to achieve monetary stability in Europe;

iii. third, to prepare for joining the Economic and Monetary Union; and

iv.   last, for the introduction of a single currency, the euro, which took place on 1 January 1999.

After joining the European Monetary System (EMS) in October 1990, speculative pressures built against the external value of the pound sterling in September 1992. On 16 September 1992 (also known as Black Wednesday) the Bank of England stopped intervening in the foreign-exchange market owing foreign-exchange losses and abandoned the exchange-rate target. Black Wednesday refers to the date 16 September 1992, when the UK was forced out of the ERM (Söderlind 2000:1 & 16).

i.   The so-called "Tequila Crisis" of 1994 and 1995

The Economic Crisis in Mexico in 1994, widely known as the "Mexican peso crisis", became an effective crisis with the sudden devaluation of the Mexican peso in

December 1994. This crisis spread to Brazil and Argentina, precipitating fears that other emerging-market economies might be susceptible to similar problems. Other emerging-market economies that were also affected by this crisis include (but are not limited to) Chile and Uruguay. The events of the Mexican economic crisis spreading to other countries, when taken together, came to be called the "Tequila Crisis" (Boughton 2000:273).

i. *The Asian financial crisis in 1997*

The Asian Financial Crisis was a period of financial crisis that gripped much of Asia at the start of July 1997 and raised fears of a worldwide economic meltdown due to financial contagion. The crisis started in Thailand with the financial collapse of the Thai baht that was caused by the decision of the Thai government to float the baht, cutting its peg to the USA dollar. At the time, Thailand had acquired a burden of foreign debt that rendered the country effectively bankrupt even before the collapse of its currency. As the crisis spread, most of Southeast Asia and Japan saw slumping currencies, devalued stock markets and other asset prices, and a precipitous rise in private debt (King 2001:441).

i. *The Russian financial crisis in 1998*

The Russian financial crisis (also called "Ruble crisis") hit Russia on 17 August 1998. It was triggered by the Asian financial crisis, which started in July 1997. Given the ensuing decline in world-commodity prices, Russia, along with other countries that are heavily dependent on the export of raw materials such as oil, were among those most severely hit. However, the primary cause of the Russian financial crisis was not directly a result of the fall of oil prices, but the result of non-payment of taxes by the energy and manufacturing industries (Hanson 1999:1152 & 115).

i.   The Turkish crises of 2000 and 2001

In February 2001, Turkey experienced a serious financial crisis. This crisis was the result of the failure of the public sector to maintain the austerity targets and implement fully the free-market rationale of globalisation. Pressures emanating from the process of integration with the global capital markets worsened the financial crisis (Cizre & Yeldan 2005:387).

i.   The crises of 2001 and 2002 in Argentina

The economic crisis in Argentina was a financial situation that affected its economy during the early 2000s. Argentina adopted the currency board system from 1 April 1991 to 6 January 2002. The move to adopt the currency board was aimed at ending the cycle of inflationary surges. Under this arrangement, the peso/dollar was fixed at one to one. However, in 1998, Argentina entered a recession phase. Some of the results of this recession were banking crises and the default of government debt. However, monetary policy under the Currency Board could not be used by the central bank to stimulate the economy as a way of curbing recession. Moreover, the Currency Board did not allow the central bank to fulfil its function as the lender of last resort constrained by the Convertibility Law of 1 April 1991. Speculative attack against the Argentine Currency Board quickly turned into a major banking crisis. As a result of these developments, the currency depreciated by more than 70,0%, which led to a full-scale financial crisis in 2002 (Nataraj & Sahoo 2003:1643-1644).

Therefore, experience suggests that unsustainable exchange-rate regimes are inherently crisis prone.

Sixth, theory and evidence indicate that exchange-rate targeting tends to create increasingly undesirable effects in emerging-market economies as transition goes on (Begg 1996). During the later stages of transition, productivity growth and emerging investment opportunities render adherence to the exchange-rate target not only inappropriate, but also unsuitable. Thus, a powerful argument against the credibility and sustainability of an exchange-rate target is that structural changes in the economy require real exchange-rate changes. In other words, robust regimes require more exchange-rate flexibility (Wagner 2000).

With the increasing liberalisation of capital flows and the globalisation of financial markets, the world has been moving away from exchange-rate targeting in recent years. Moreover, the dissatisfaction with an exchange-rate targeting regime has led to a search for another nominal anchor. As a consequence of this move, the exchange rate has become a less vital issue in economic policy debate. One of the alternatives is monetary-aggregate targeting. Some of the countries that abandoned an exchange-rate targeting regime moved to a monetary-aggregate targeting framework as their nominal anchor.

4.2.2.2   *Monetary-aggregate targeting*

Monetarists considered monetary-aggregate targeting as a solution to the problems associated with exchange-rate targeting (Campbell & Dougan 1988). Monetary-aggregate targeting involves three elements:

i.   the reliance on information conveyed by a monetary aggregate to conduct monetary policy;

ii. the announcement of medium-term targets for monetary aggregates; and

iii.   some accountability mechanism to preclude large, systematic deviations from the monetary targets (Mishkin 1999).

The German Bundesbank was the first central bank to lay down a money-supply target in 1975 (Bernanke & Mihov 1997). Authors such as Schmid (1999) and McCallum (1985) highlight the use of monetary-aggregate targeting in various countries. Meltzer (1998) defines a monetary-aggregate targeting framework as that which a central bank does to control the money supply, and thereby to manage demand. Its principle is targeting the growth rate of the money supply for controlling inflation. Thus, if the rate of growth of the money supply is controlled effectively over time, so will inflation be controlled or, to put it differently, stabilising the growth of the money supply would lead to stable prices (Lai *et al.* 2005; Moore 1988). Hence, monetary policy under such a regime focuses on ensuring an appropriate growth rate of the chosen monetary aggregate, or the monetary policy is directed towards controlling the rate of expansion in the total money supply (Croce & Khan 2000). According to Goodfriend (2007), this principle is based on the following arguments:

i.   the assertion that the cure for inflation is a monetary one;

ii.   the theoretical finding that, in the long run, price growth is affected by money-supply growth;

iii.   a central bank could exercise sufficient control of money to control inflation through its monopoly on currency and bank reserves; and

iv.   a stable relationship should exist between nominal expenditure and the quantity of money.

As a result, a monetary-aggregate target tends to be viewed as the target of the central bank, with the government exonerating itself from responsibility for its achievement.

Moreover, this monetary-policy strategy is based on the quantity theory of money, where $MV = PQ$, with M = money supply, V = velocity, P = prices, and Q = quantity (de Grauwe & Polan 2005:240). The quantity theory of money is the theory that money supply has a direct, positive relationship with the price level. This theory is a measure of the extent to which inflation movements can be explained by monetary forces. Moreover, the quantity theory of money states that changes in money supply-growth are followed by an equal change in the rate of inflation through nominal interest rates (de Grauwe & Polan 2005:240). This theory proves that the quantity of money available in an economy determines the value of money. If V remains stable in this equation, any change in M will impact on nominal PQ, implying that control over the rate of growth will also ensure control over a nominal GDP, where $GDP = PQ$ and, therefore, also control price changes (de Long 2000; Davidson 2006).

Despite guidelines provided by Issing (1997:68), and Mishkin and Savastano (2001:423) for choosing the appropriate monetary aggregate to target, evidence suggests that there is still no consensus among central banks on which monetary aggregate should be targeted, that is, $M1$, $M2$ or $M3$ (Cagan 1982; Bernanke & Mihov 1998; Woodford 2007). Reference, however, needs to be made to what is known in banking circles as "Goodhart's Law". The law was named after its founder, Charles Goodhart, in 1975. Although it can be expressed in a variety of formulations, the Goodhart Law states that any money-supply indicator that is targeted becomes distorted over time and accordingly loses its validity in such a way that the central bank cannot use the indicator as a money-supply target (Evans 1985).

Just like any other regime, monetary-aggregate targeting has its advantages and disadvantages. The advantages of monetary targeting highlighted by Mishkin (1999), Houben (2000:78), and Mishkin and Savastano (2001:424), include the following:

First, unlike the exchange-rate targeting regime, money targeting enables central banks to adjust monetary policy to cope with domestic considerations, that is, central banks are not treated as unified actors (von Hagen 1998). Thus, monetary-aggregate targeting takes into account that monetary-policy decisions involve many different individuals with diverse preferences and dissimilar views of the economy.

Second, central banks have a large degree of independence in the conduct of monetary policy under the monetary-targeting framework. The independence of the central banks enables them to defend themselves against domestic shocks; to choose inflation goals that may be different from those of other countries; and accommodate other monetary policy goals. Therefore, no monetary-targeting central bank adheres to strict, ironclad rules for monetary growth, that is, some flexibility is allowed in this regime (Bernanke & Mishkin 1992; Mishkin 1999).

The third advantage of a monetary-targeting framework is that it has the potential of relative controllability and its tight control prevents the monetisation of government debt. This is argued to be the case particularly when the central bank is targeting a narrow monetary aggregate. This reason is that the central bank can be reasonably confident of its ability to achieve a narrow monetary target (Mishkin 1999).

Fourth, the announcement of a monetary-aggregate target is a self-imposed commitment by central banks and an enhanced verifiability of their performances. The reason is that it is easy to monitor or determine whether or not the central bank is meeting its monetary targets as data are usually available without any major time lag or are published frequently (Schmid 1999:4). Announced monetary-aggregate targets are used as a benchmark for measuring central banks' performance, enhance public awareness of the link between the money supply and prices, and are a signal to both the public and markets regarding probable monetary policy actions and the

monetary policy stance of the central bank. Advance notification of the intended stance of monetary policy could facilitate appropriate adjustments in wages and salary demands as well as spending plans of businesses.

Fifth, monetary-aggregate targeting has the advantage of being transparent. This is because the calculation of target ranges has become a public exercise, and the intentions of policy-makers to control inflation are clear to both the public and the markets. Thus, the public and the markets are fully aware of the exact monetary policy goals of the central banks. Furthermore, the public and the markets can compare the targeted monetary aggregate and actual monetary aggregate level, and target misses require a detailed justification by the central banks (Mishkin & Posen 1997).

Sixth, monetary-aggregate targeting promotes an almost immediate accountability for monetary policy to keep inflation low and to help constrain monetary policy-makers from falling into the time-inconsistency problem or trap. In this case the central banks are liable to meet the announced monetary-aggregate target, and it is believed that under this monetary-policy strategy, the pressure on a central bank to pursue other monetary-policy objectives is minimised due to transparency of this monetary-policy regime (Schmid 1999; Mishkin 1999).

Seventh, monetary targeting provides a nominal anchor that is fairly easily understood and communicated to the public (Mishkin 1999; Croce & Khan 2000).

Lastly, policy based on monetary targets typically involves little analytical effort due to limited requirements for the operation of this regime. The requirements include yearly assumptions on trend real growth, trend money velocity, and the base multiplier.

The disadvantages of monetary-aggregate targeting have been well documented. These disadvantages have been cited as reasons for abandoning this monetary-policy strategy. They include the following:

First, accurate control of the monetary stock is simply not feasible or will require undesirable movements in the policy instrument. As a result, the central bank may not be able to manage the selected monetary aggregate with sufficient precision (Cagan & Dewald 1985). Critics of monetary-aggregate targeting argue that the set target can only be achieved through tight monetary policy that leads to extreme volatility of interest rates. Moreover, frequent target misses may also lead to instrument instability (McCallum 1985).

Second, monetary-aggregate targeting relies heavily on a stable money-inflation relationship that produces poor outcomes (Fontana & Palacio-Vera 2004; Taylor 1995). In an environment of financial innovation, improvements in transaction technology, market computation and globalisation, their relationship is ever more volatile and therefore more difficult to predict, resulting in the erosion of the benefits of monetary-aggregate targeting (Arestis & Howels 1992; Clarida *et al.* 1999). This relationship began to break down in the 1980s as money-demand equations moved off track, leading to a limited role of money in the modern approach to monetary policy (Dalziel 2002; Söderström 2005). These developments led to the monetary-aggregate targeting strategy being downplayed or abandoned by the majority of monetary targeters in the 1980s.

Third, there is a weak relationship between the monetary aggregates and goal variable. This relationship challenges the transparency and accountability of the central bank to both the public and the markets, and questions the ability of monetary

targeting to serve as a communications device. Hence, the credibility of the central bank is hindered (Wagner 2000).

Fourth, the monetary-targeting framework only reacts to overshooting the target with lags between monetary aggregates and nominal income, and is therefore not a proactive monetary policy. To influence future inflation, it is argued that the central bank must act well in advance to the possibility of overshooting the monetary targets (Bryant 1982).

Fifth, monetary-aggregate targeting focuses attention on or targets an intermediate goal, that is, it focuses attention on the achievement of a target path for some variable that is itself neither an ultimate goal nor a directly controllable instrument. The interference of an intermediate variable can only be detrimental to the achievement of the actual goal, or lead to policy mistakes (Bryant 1982).

Sixth, the monetary-aggregate targeting framework subordinates other macroeconomic goals to monetary-aggregate targeting. Debelle *et al.* (1998) argues that little is achieved if the central bank successfully meets its monetary target but inflation and output growth are not close to their desired rates.

Seventh, the extent in which the government views an explicit monetary target as the central bank target might be problematic. The government might pursue policies that are not supportive of the target achievement (Fontana & Palacio-Vera 2004).

Last, under monetary-aggregate targeting, there is little discretion for the central bank to use its judgement in assessing the supply of money needed in the economy. In practice, successful monetary targeters actively take into account the variability of money supply and the economic relationship (Hammond 2009).

By the mid-1980s, it was clear that monetary-aggregate targeting had failed as a nominal anchor for the policy of the central bank. In some countries that had earlier adopted a floating exchange rate, the inability to use either of the traditional, nominal anchor (exchange rate and monetary-aggregate targeting) left a vacuum that was filled by a qualitative commitment to low inflation. However, several economists have proposed that central banks should target the interest-rate level. Parkin (1998) suggested a switch from monetary-aggregate targeting to interest-rate targeting.

4.2.2.3   *Interest-rate targeting*

Central bankers and even some economists talk knowledgeably of using interest rates to control inflation. Interest-rate targeting is a monetary-policy strategy that target a given level of interest rate with which the central bank seeks to influence short-term interest rates. However, it should be at the outset that interest-rate targeting is seen as relating to short term nominal interest rates. The alternatives of short term or long term nominal interest rates are not considered targeting options because they are not under the systematic control of the central bank. Interest-rate targeting is also associated with the "money-dominant" or "Ricardian" regime. A Recardian regime is the fiscal analogue to interest-rate targets or accommodative money supply rules that can leave the price level indeterminate in the quantity theory (Cochrane 1999:335). Some scholars such as Poole (1970) argue that, when the money-demand function becomes a major source of instability in the economy, central banks should concentrate on the interest-rate target. Moreover, an interest-rate targeting regime is characterised by a floating exchange rate which avoids the difficulty of targeting two things by the monetary authority of large or open economy due to the fact that a small open economy cannot affect its real interest rate (Balduzzi *et al.* 1998).

However, one needs to differentiate between the two meanings of interest-rate targeting in practice (Dotsey & King 1986; Woodford 2003). Barro (1989) used the term both to indicate the choice of an interest rate as a short-run instrument of monetary-policy control, and to refer to the objective of a central bank that does include the smoothing of interest rates. This above usage of interest-rate targeting implies the following: first, interest-rate target as an operational objective in which the target is set with a view of achieving other intermediate goals, and second as an intermediate objective in which the target is treated as an end in itself. While central banks use interest-rate targeting in the operational sense, the later meaning of interest-rate targeting is adopted for the purpose of this study.

Proponents of interest-rate targeting believe that a central bank has the power to control the interest rate as a way of conducting monetary policy. Most central banks use interest-rate targets as their operating objective in the implementation of monetary policy (Guthrie & Wright 2004). The use of this policy implies that the central bank sets interest rates at some predetermined, real margin above the rate of inflation. This policy regime presumes that all other interest rates move in tandem with the interest-rate target. A nominal interest rate is targeted to stabilise inflation and economic growth, that is, monetary policy operates through interest rates that will influence aggregate demand and, thereby, inflation. Thus, a central bank chooses to keep the policy rate at a prescribed level to achieve its objective of price stability, or it tries to bring down the inflation rate by committing itself to achieving a low interest rate. The preferred level of the target rate of the central bank at each point in time takes into account all relevant factors, except any costs of changing the target rate itself. Thus, the central bank ties down the market interest rate by choosing the level of the target rate. In certain cases, the target is normally adjusted in relatively small steps by the central bank at irregular intervals, and only after sufficient information has been accumulated to trigger a target change (Goodfriend

2007; Carlstrom & Fuerst 1995). For example, a central bank changes the interest rate whenever the deviation between its preferred rate and the current target rate reaches critical level. Moreover, a central bank can also change the target range when economic or market conditions require it. However, practical experience demonstrates that the market rate deviates from the target at times owing to transitory liquidity shocks (Guthrie & Wright 2004; Kobayashi 2004).

In principle, however, if interest-rate targeting is to be used, it should be supported by other elements in the context of a combined or eclectic strategy. Alternatively, interest rates can be used as operating targets or information variables thereby serving as important building blocks and not as a the corner stone of monetary-policy strategy (Houben 2000:87).

Interest-rate targeting is considered to have advantages and disadvantages. Advantages cited by, among others, Houben (2000:87), Quiggin (1997:179 & 180), Teruyoshi (2004), and Carlstrom and Fuerst (1996) include the following:

First, interest-rate targeting has the advantage of offsetting real shocks, that is, interest rates can be lowered in difficult times.

Second, interest-rate targeting is regarded to have the advantage of eliminating the distortion caused by sluggish portfolios. That is, an interest-rate targeting allows labour, and thus output and consumption, to respond optimally to economic shocks.

Third, the interest-rate targeting rule is regarded as simple, easy to understand and monitorable by the public. This is because interest rates data are available without any lag and risk of statistical revisions. As a result, interest-rate targeting can help

establish a policy rule to which the central bank can be held directly and precisely accountable.

Fourth, interest-rate targeting is able to deal with the time-inconsistency problem.

Fifth, interest-rate targeting leads the central bank to make smaller interventions, which limits the scope of uncertain preferences of the central bank to impact on the economy.

Sixth, it is relatively ease to communicate the interest-rate targeting framework. This is because interest rates are arguably the most visible elements of monetary policy. This makes interest-rate targeting well-suited to communicating policy intentions. Communication simplicity enhances or supports the interest-rate targeting framework. In terms of a simple application of the interest-rate target, the public can be informed that the rates will be kept at a predetermined margin above the rate of inflation.

Seventh, variations in the inflation rate translate directly into variations in the interest rate. The objective of stabilising real interest rates is equivalent to the objective of eliminating unanticipated inflation.

Eighth, since interest rates are at the beginning of the monetary transmission process, adherence to interest-rate targets is conducive for building credibility of the monetary authority. This happens long before the policy outcomes in terms of inflation and output are known.

Ninth, interest rate developments are highly visible and tightly controllable, thereby strengthening transparency and accountability of monetary policy-making.

Last, successful targeting of the interest rate can ensure interest-rate stability, particularly once the public accepts the credibility of such a policy.

Despite the above-mentioned advantages of the interest-rate targeting framework, it has attracted a number of criticisms included in various texts in literature, such as Balduzzi *et al.* (1998) and Houben (2000:88).

First, interest rates must rise excessively above the inflation level for inflation to be cured. This is the case, even in difficult times that deepen economic problems particularly by choking economic growth. Thus, there is absence of a mechanism to pin down the price level.

Second, an interest-rate targeting regime requires substantial fiscal slack. This means that interest-rate targeting does not solve the fiscal temptation to inflate the interest rate in an attempt to boost the economy.

Third, under interest-rate targeting, the economy loses its nominal anchor and the rate of monetary growth passively accommodates inflation. This is because there is no long-run value of the inflation rate (i.e., nominal anchor) to guide the inflation rate to a specific value.

Fourth, under the interest-rate targeting framework, there is lack of predictability of the short-term rates as inflation rates vary over time. This is because variations in the rate of inflation translate directly into variations in the nominal interest rate (Quiggin 1997:180). In the absence of a stable and predictable short-term interest rates, the

market has no benchmark to set up interest rate. Hence, most central banks and academics emphasise the predictability of interest rate as an important ingredient in the successful and effective conduct of monetary policy.

Fifth, interest-rate targeting requires some additional mechanisms to pin down the levels of nominal variables. In practice, difficulties with interest-rate targeting are most likely to arise in periods when inflation and inflation expectations change and become subject to pronounced shifts.

Sixth, under interest-rate targeting, there is no predetermined relationship between the interest rate level and the end objective of monetary policy, that is, inflation and output. Since the equilibrium level of interest rate is unknown and constantly fluctuates as a result of economic adjustments, interest-rate targeting risks feeding into an inflationary or deflationary spiral. If interest rate is set above its equilibrium level, the economy will be placed on a deflationary spiral and vice versa. Therefore, interest-rate targeting does not provide a nominal anchor for price level.

Seven, an increase in indirect taxes can be problematic under interest-rate targeting as such an increase will trigger an increase in interest rates. Increase in indirect taxes feed through statistically into the rate of inflation, albeit normally for one year only. The implication is that an increase in indirect taxes can trigger an increase in nominal interest rates for the feed-through period to protect the predetermined real interest rate margin.

Eighth, monetary policy is made more susceptible to outside pressures. This is because there is no objective measure of establishing whether a specific interest-rate target is inflationary or deflationary which renders monetary policy vulnerable to

pressures to adopt expansionary policy stance. With no clear-cut way of telling whether monetary policy is loose or tight, short term considerations are more likely to prevail and any pre-emptive policy adjustments will be more difficult to carry through.

Ninth, interest-rate targets by themselves do not anchor the inflation rate and thus do not provide reliable guidance on whether monetary policy is on course to achieve objectives.

Last, the government can regard interest-rate target as the target of the central bank, therefore not giving it the necessary policy support. This is because the target is not set by the government in conjunction with the central bank but by the central bank alone. In this view, targeting interest rates is either impossible or undesirable (Barro 1989).

4.2.2.4   Discretionary monetary policy

A discretionary or combined monetary-policy regime is also known as the "just trust us" or "just do it" approach or monetary policy with an implicit but no explicit nominal anchor (Bernanke *et al.* 1999b). The term "just do it" was coined by Mishkin in 1997. It is defined as a regime with an implicit nominal anchor, and targets certain nominal variables not announced explicitly but adopted only internally within the central bank without a specific parameters or criterion being declared, that is, no specific objectives for monetary policy are laid down or in practice, this strategy does not explicitly prioritise one target above the other (Bernanke 2003b; Houben 2000). Instead, a discretionary monetary-policy approach monitors many variables such as inflation, unemployment, and economic growth, and identifies sources of monetary disturbances instead of simply one indicator to guide monetary policy. Moreover, other policy objectives such as price stability and full employment may be specified

under this regime, but may not offer clear articulation of what they mean operationally and how conflict between objectives are to be resolved (Debelle *et al.* 1998). Consequently, a monetary-policy strategy is less transparent and economic agents do not always know the nominal anchor for monetary policy or the targeted variable. Moreover, this regime treats the central bank as a knowledgeable institution that does not require intervention or assistance in conducting monetary policy. Advocates of this approach have firmly rejected the use of strict rules for policy and have suggested that central bankers be left free to change monetary policy as they see fit, based on their best judgment and the use of all relevant information. Thus, this regime gives a central bank substantial room and autonomy in conducting monetary policy. This means that the central banks are free to do their best to stabilise output and employment in the face of short-run disturbances, with appropriate caution born of imperfect knowledge of the economy and of the effects of policy (Bernanke 2003b). However, the discretionary monetary-policy approach applies discretion when adjusting policy. Proponents of this regime believe that the discretion of policy-makers is constrained by a strong commitment to keeping inflation low and stable. Bernanke (2003b) defines "constrained discretion" as a monetary-policy framework that allows monetary policy-makers considerable flexibility in responding to economic shocks, financial disturbances, and other unforeseen developments.

Moreover, Houben (2000) argues that discretionary monetary-policy strategy seeks to mitigate the drawbacks of individual monetary-policy strategies while cumulating their benefits. It aims to build safeguards in the event that individual monetary-policy strategies prove to be an unreliable guidepost to monetary policy-making.

Some of the advantages of a discretionary monetary-policy regime include the following:

First, it has a history of success. Discretionary monetary-policy strategy has worked well in the past and the success of the USA with this regime is a prime example. The rate of inflation in the USA was reduced from double digit levels to the 3,0% levels by the early 1990s. Since then, the rate of inflation has been stable at this level or below it (Bernanke *et al.* 2004; Mishkin 1999).

Second, a discretionary monetary-policy regime has the potential to solve the time-inconsistency problem by engaging in "forward-looking behaviour" (Mishkin 1999).

The third advantage of a discretionary monetary-policy approach hovers around the argument, "If it ain't broke, why fix it?" (Mishkin 1999).

Proponents of this policy approach argue that there is no need to replace it as it is working well, particularly in our modern dynamic world where monetary policy is continuously tested by different challenges (Bernanke *et al.* 2004). The success of the discretionary monetary-policy regime was not only limited to inflation levels, but has also improved economic growth and the rate of unemployment performance in countries that have adopted it (McConnell & Pérez-Quirós 2000).

Fourth, by employing two or more targets, discretionary monetary-policy approach alleviates the loss of credibility as a result of missing a specific target (Houben 2000:115).

Fifth, the use of two or more targets under discretionary monetary-policy framework serves to spread the risks ensuing from an unstable relationship between an individual intermediate target and the final objective (Houben 2000).

Sixth, discretionary monetary policy enhances the autonomy of the central bank. This is particularly the case when target variables are fully within the domain of the central bank (Houben 2000).

Last, highlighting more than one policy target explicitly broadens the orientation of monetary-policy decision-making and facilitates the communication of monetary policy when a target variable is influenced by unforeseen disturbances.

However, a discretionary monetary-policy regime also has some shortcomings. The main disadvantages of this strategy, as indicated by Mishkin (1999) and Houben (2000), include the following:

First, the discretionary monetary-policy approach has been criticised for its lack of an explicit nominal anchor. Critics of this approach argue that due to a lack of an explicit nominal anchor, the performance of a central bank cannot be measured under this monetary-policy strategy. Moreover, the absence of a nominal anchor may be problematic in that it renders this approach ineffective in dealing with supply or other shock problems, and locks in low inflation. The reason is that containing the medium-term effects of supply shocks by the central banks may raise inflationary expectations. Moreover, central banks may be too scared to act properly in time. Thus, public criticism may force the central bank to delay its action, which may result in higher inflation in the medium term (Debelle *et al.* 1998). Political problems may also arise in the absence of an explicit nominal anchor. This is argued to be the case as the public does not understand the reasons for a rise in interest rates, which results in criticism of such a policy move.

Second, the independence of the central banks can easily be sacrificed under the discretionary monetary-policy strategy as a result of political influence on monetary-policy decision-making (Debelle *et al.* 1998).

Third, discretionary monetary-policy strategy suffers from a lack of transparency as a result of the absence of a nominal anchor. Since there is no official nominal anchor, it makes it difficult for the public and the markets to know the intentions of the central bank, resulting in their having to rely on their guesswork, thereby creating confusion in the market place. Moreover, the possibility of changing the priorities of the central bank on a continuous basis exists, which is likely to undermine the confidence of the public in the central bank (Debelle *et al.* 1998). The closed-mouth approach adopted under a discretionary monetary-policy strategy creates uncertainty among the general public and volatility in the financial markets. As a result, the economic and financial uncertainty drives the economy to function less efficiently.

Fourth, an opaque policy-making process impairs accountability to government and the public by the central bank. A lack of accountability by the central bank is more likely to lead to a time-inconsistency problem whereby it may pursue short-term objectives at the expense of long-term ones. The result then is poor long-run outcomes, and higher inflation, with no benefit to the output front (Mishkin & Westelius 2008).

Fifth, using a set of indicators such as the rate of inflation and exchange rate also runs the danger of inducing central banks to procrastinate and do not take action, especially when the chosen indicators move in different directions, even though action on the monetary policy is required (Mishkin & Westelius 2008).

Sixth, discretionary monetary-policy strategy has also been criticised for its heavy dependence on the preference, trustworthiness and skills of individuals in the central bank, that is, for personalising monetary policy. As Bernanke *et al.* (1999b) eloquently put it, the "just trust us" approach may work in a period when the Chair and Board of Governors command widespread support and confidence. In the USA, the success of the Chair of the Federal Reserve, Mr Alan Greenspan, and other federal officials, provides a typical example. The economy in the USA has been successful in containing low and stable inflation by using a discretionary monetary-policy strategy (Bernanke 2000). However, the fact is that leadership inevitably changes, which may jeopardise the working relationship between the Federal Bank and its executive branches. Therefore, such a good working relationship may not necessarily continue. This may put pressure on the Federal Bank to apply an over-expansionary policy in future that will boost inflation in the process.

Seventh, conflict during implementation may arise under the discretionary monetary-policy framework by employing two or more policy targets (Houben 2000).

Eighth, regardless of what the central bank might proclaim, the different targets under a discretionary policy strategy will never be of equal standing in practice (Houben 2000).

Last, a discretionary monetary policy can mean that the relevant central bank faces a credibility problem in the financial markets. Economic agents cannot easily assess either the objectives of the monetary policy or the likely reactions to different forms of economic disturbance. Economic agents are not sure whether the central bank will weaken or abandon its commitment to any stated or unstated policy goals (Mishkin & Westelius 2008).

4.2.2.5 *Nominal GDP targeting*

The awareness of the problems of the previous monetary-policy frameworks such as exchange-rate targeting led to considerable attention to the option of targeting nominal income. The targeting of nominal GDP was first proposed by Tobin (Parkin 1999:805). However, it should be mentioned that no country or central bank has seriously considered the introduction of nominal GDP target (Bernanke *et al.* 1999a:307). "Nominal-income targeting" can be defined as a monetary-policy strategy that a central bank seeks to achieve price stability by steering the expansion of a nominal income at the same rate as that of the potential output (Houben 2000). Although nominal-income targeting itself is not a traditional ultimate goal variable, it deserves serious consideration as a primary monetary-policy strategy (Rudebusch 2002; Bradley & Jansen 1989; McCallum & Nelson 1999). The call for a nominal GDP targeting began in the 1980s when disillusionment with money targets was widespread and grew naturally, based on the perception that the monetary-targeting strategy could be improved upon, particularly as far as the time-inconsistency problem was concerned. Moreover, since it could produce relative stability of inflation and output, the proposal to target a nominal income has been advocated by a number of economists such as Orphanides (2003), and Frisch and Staudinger (2003). McCallum (1989) suggests that a nominal GDP targeting is preferable where the inflation control is not the sole concern of monetary policy. Proponents of nominal GDP targeting assume rational expectations on the part of economic agents. Moreover, advocates of nominal GDP targeting have emphasised its operability, robustness and dependants only on variables known to policy-makers (Dennis 2001). This is because the GDP is a well known measure of economic activity among policy-makers and non-policy-makers. Moreover, it is closely related to two important objectives of monetary policy, namely achieving long-run price stability, and

sustainable economic growth (McCallum 1988; Frisch & Staudinger 2003; Mitra 2003).

However, Domac and Kandil (2002) highlight two major approaches that have been suggested in the literature on nominal GDP targeting by Hall and Mankiw (1994). The first approach employs nominal income in conjunction with other economic or financial variables. For example, policy-makers use nominal-income targets to determine appropriate targets for monetary aggregates. Nominal income is, therefore, the ultimate target. The second approach suggested by Hall and Mankiw (1994) uses targets for nominal income by themselves. In contrast to the first approach, a nominal income is the intermediate target of this approach. That is, nominal income is the sole target of monetary policy.

Under nominal-income targeting, the central bank seeks to achieve price stability by steering the expansion of nominal income at the same rate as that of potential output. Moreover, any change in inflation is known to be due to supply shocks. The monetary authority set targets for a nominal income that are in line with the goals of monetary policy, and try to keep a nominal income close to its target (Domac and Kandil 2002). This implies that a nominal-income target puts some weight on output as well as on prices in the implementation of monetary policy. Moreover, the monetary authority publicly announces an estimate of potential, nominal and real income growth as it serves as the basis for targeting a nominal level of income. The central bank increases interest rates when the nominal income increases above the target growth rate, and adjusts rates downward if the nominal income declines below the targeted rate (Jansen & Kim 1993; Bernanke *et al.* 1999a:306).

Similar to other monetary-policy regimes that have been discussed in this chapter, a nominal GDP targeting offers some benefits and costs to the economy. The benefits associated with nominal GDP targeting include the following:

First, the main advantage of nominal GDP targeting is that it does not rely on knowledge of the output gap.

Second, it obliges the policy-making process to put some weight on output and prices. The movement of output and prices determines the monetary policy stance under the nominal GDP targeting framework. For example, declining output growth will imply an increase in the inflation target of the central bank that will tend to stabilise shocks because it will automatically lead to an easier monetary policy (Bernanke *et al.* 1999a:306; Mishkin 1999).

Third, it reduces volatility in the price level and the inflation rate (Hall & Mankiw 1994). Monetary policy under nominal GDP targeting also provides a flexible monetary policy that easily adjusts to offset disturbances to aggregate demand. Clark (1994) further argues that nominal GDP targeting assists policy-makers to balance the goals of stable growth and inflation by responding to aggregate-supply disturbances.

Fourth, the government is forced to make public its estimate of the potential real GDP target to the nominal GDP target included in this approach (Bernanke *et al.* 1999a; Mishkin 1999).

Fifth, there is an inherent logic to targeting nominal income since it brings together the two principal macroeconomic objectives that are directly influenced, at least in the

short run to medium term, by monetary policy, namely low inflation and high, real output (Houben 2000).

Sixth, nominal-income targeting has the advantage of communicating the basic goals of monetary policy to the outside world (Houben 2000).

Seventh, next to providing a clear link to the relevant policy goals, nominal-income targets have the attraction of ensuring comparability between inflation and growth objectives such that one objective cannot be pursued at the expense of the other. In this case, nominal-income targeting addresses the root of the inflation bias stemming from the short-run trade-off between inflation and output (Houben 2000).

Eighth, nominal-income targeting has stability properties. In particular, it insulates the economy in the face of shocks to money velocity, which the central bank would undertake to accommodate, that is, nominal-income targeting effectively minimises the destabilising effects of shock disturbances.

Ninth, nominal-income targeting provides explicit guidance to policy-makers on how to balance the division of the adjustment burden between a change in the price level and an opposite change in real income. By specifically placing equal weight on achieving both the growth and inflation objective, this approach ensures that policy response duly takes both goals into account (Houben 2000).

Last, the government shares responsibility for the achievement of the target as both authorities, the government and the central bank, have to publicly announce the estimates of potential, real and nominal income for targeting purposes. As a result, government will not follow policies that are not conducive to the achievement of the target (Mishkin 1999).

Nominal GDP targeting has also been subjected to criticism and objections from economists such as Houben (2000), Axilrod (1985) and Poole (1985). The following are, among them, notable:

First, it is often argued that central banks have only a limited ability to influence short-run movements in nominal income. As a result, governments or central banks do not like to announce nominal-income targets because it cannot be controlled, and errors will entail a loss of credibility.

Second, national income statistics are not produced often or quickly enough, and are significantly revised after their first release. It might therefore be difficult to ascertain the policy stance or consider timely adjustments to the policy to ensure achievement of the target.

Third, the concept of a nominal GDP is not better understood by the public than the CPI, and is easily confused with the real GDP. As a result, communication to the public and the accountability of the central bank are not better served under this strategy (Bernanke *et al*. 1999a).

Fourth, estimates of potential real GDP growth can also be problematic as such estimates are far from precise, even in retrospect. Thus, imprecise estimates of a potential nominal income would feed into imprecise targets for nominal-income growth. Moreover, if the nominal target is set too high as a result of overestimating potential real growth, it might lead to the introduction of inflation into the economy.

Fifth, nominal GDP targeting is ineffective in achieving short-run stabilisation (Mishkin 1999).

Sixth, nominal GDP targeting is less transparent because of greater problems concerning the measurement of target quantities (Tuma 2000).

Seventh, the definition of the target may be problematic under nominal-income targeting. The reason is because there are several proposals that include the Gross National Product (GNP); gross domestic expenditure; and final sales targets, with the first two alternatives receiving the most attention (Argy 1991).

Eighth, a conceptual problem is that nominal-income targets are situated right at the end of the process of monetary transmission and are not, by themselves, appropriate leading indicators for future nominal income. Thus, it makes a poor guide for short-term monetary-policy decisions, leading either to policy instability or to inaction.

Ninth, it is difficult to project nominal income precisely and reliably. In this respect, nominal-income targeting can be considered a relatively demanding strategy in terms of information requirements. Thus, to be effective, substantial knowledge is needed of current and prospective output and prices, and of how developments in these variables are influenced by monetary-policy changes.

Tenth, a further issue is the equal weight placed by nominal-income targeting on achieving inflation and output objectives since it is doubtful whether this parity accurately reflects the preferences of society. If, for instance, the public were to attach more importance to output stability than to price stability, adhering to nominal-income targets will lead to excessive output stability.

Eleventh, a strategy of nominal-income targeting makes it difficult to hold central bank accountable for the outcome of its decisions. This is because the central bank can not be responsible for an aggregate that is dependant on the policy

developments, notably fiscal policy that is far outside its direct control. As a result, the central bank runs the risk of losing credibility if it adopts this strategy.

Last, problems may also arise due to political involvement in setting nominal income targets. This is because it is more likely in practice that nominal income targets will be set by politicians and central bank due to the importance of policy mix in achieving the set targets and target's inclusion of real income objectives. As a result, there is a risk of growth projections to be set too high, thereby loosening monetary policy's anchor.

4.3   SUMMARY

Chapter Four sought to discuss and scrutinise alternative monetary-policy strategies. It was established in this chapter that finding a monetary-policy regime that can deliver some form of price stability as well as satisfactory economic performance has always been explained more convincingly in theory than in practice. Consequently, central banks over time, have experimented with policies ranging from exchange-rate targeting to monetary-aggregate targeting. However, exchange-rate targets have been shown to be dangerous to economic prosperity; monetary targets have been revealed to be unreliable; and monetary-policy frameworks that involve multiple objectives (such as discretionary monetary-policy regimes) do not offer much guidance for policy-makers or to the general public; and other monetary-policy regimes remain untested. Thus, alternative monetary-policy frameworks have not provided the flexibility required to withstand different types of shocks and, in fact, have made it harder to maintain price stability while avoiding unnecessary volatility in the wider economy.

The latest regime in monetary-policy formulation, however, is a renewed interest in inflation targeting. Based on merits, this policy has attracted the attention of policy-makers and the public alike (Siklos 1999). Many central banks adopted an inflation-targeting framework as a pragmatic response to the failure of indirect approaches or other monetary-policy regimes to yield acceptable results and the lack of policy alternatives rather than in response to new economic thinking or just sticking to inflation targeting (Walsh 2009; Hammond 2009). Moreover, monetary authorities also acknowledged that having no framework for a monetary policy or a framework with little or nothing to contribute to the overall economic performance, does not enhance their credibility. The case for targeting inflation is bolstered by the following two reasons, namely the convergence around the world in both goals and methods used to conduct monetary policy since the 1990s; and the overriding requirement for monetary policy to provide a nominal anchor to control inflation, and inflationary expectations directly (Allsop & Vines 2000; Roger & Stone 2005).

CHAPTER FIVE

EXPERIENCE WITH THE INFLATION-TARGETING FRAMEWORK

5.1   INTRODUCTION

Apart from Chapter Four that discussed the case for and against the inflation-targeting framework, Chapter Five attempts to review experience in many countries with the inflation-targeting framework. The task at hand is to present a review of the relevant experience of the different nations since the adoption of their inflation targets. The most basic question to ask is whether the inflation-targeting framework has reduced inflation to targets in inflation-targeting countries. However, the performance of other macroeconomic variables, such as economic growth, and the unemployment and interest rates under the inflation-targeting framework, will be briefly evaluated. Thus, the inflation-targeting experience will be evaluated in the following areas: the lowering of the inflation rate, the achievement of target, and the performance of economic growth, unemployment, and interest rates.

5.2   THE EXPERIENCE OF VARIOUS COUNTRIES WITH AN INFLATION-TARGETING FRAMEWORK

There is some debate in the literature as to the start of inflation targeting in some countries. This is because in a number of cases, the exact inflation-targeting adoption date is unclear. This is largely because the regime was gradually adopted, with central banks taking time in adjusting their structure to the new regime, even though its introduction was announced well in advance. This is further complicated by

the fact that, in practice, none of the inflation-targeting countries gave clear priority to inflation targeting over their exchange-rate objective until the second half of the 1990s (Mishkin & Schmidt-Hebbel 2006). This makes the exact timing of adoption somewhat difficult, and different dates can be argued for, based on criteria that are deemed necessary for the regime to be defined as one of formal-inflation targeting. Some analysts use the date that a country started using some form of inflation targeting by simply announcing numerical targets for inflation, or by stating that they were switching to inflation targeting, even if the central bank had not adopted any inflation-targeting features, and had even been formally adhering to another nominal anchors at the same time, while others date inflation targeting to when the central bank had adopted all of the inflation-targeting features and there were numerical targets for inflation, together with the absence of nominal anchors other than the inflation targets (Carare & Stone 2006; Filardo and Genberg 2010:251).

However, countries are classified as full-fledged inflation targeters when the target becomes an objective in its own right, rather than an instrument aimed at achieving general stability in the economy. Moreover, these countries do not use the inflation target in conjunction with any other monetary-policy objectives such as the exchange rate or money-supply growth targets. However, for the purpose of this study, the formal inflation-targeting criteria or dates will be used to evaluate the performance of inflation-targeting countries that will now be addressed.

5.2.1 New Zealand

New Zealand is the pioneering country of inflation targeting, and has the longest experience with the inflation-targeting framework. An implicit inflation-targeting policy started in 1988, and a full-fledged inflation-targeting framework in March 1990 (Paulin

2006; Vega & Winkelried 2005). Its experience with inflation targeting has generally been positive (Ammer & Freeman 1995; Brash 2002; Sherwin 1999).

5.2.1.1 *Lowering the inflation rate*

Table 5.1 shows the average inflation rate ten years prior to the adoption of a policy of inflation targeting. For the purpose of comparison, this table demonstrates that the inflation rate on average declined from 11,6% experienced ten years prior to inflation targeting to 2,3% after the adoption of the inflation-targeting framework. These results suggest that inflation targeting has contributed to a significant reduction in the average inflation rate to rates consistent with price stability. This achievement was still possible even after taking into account the recent global economic crisis. Thus, inflation rate remained low by the historical standard of the country. Moreover, Table 5.1 also depicts that the mean absolute deviation (MAD) of inflation during the inflation-targeting period was 1,0%, suggesting higher inflation volatility, particularly among industrialised countries during the same period. Nevertheless, inflation volatility was lower during the targeting period when compared with the period prior to the adoption of inflation targeting. Bollard and Hunt (2005), and Angeriz and Arestis (2006) presented similar results of lower inflation volatility during the inflation-targeting period.

Table 5.1: The inflation rate in New Zealand

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	17,2	1990	4,9	4,9	2,6	3% - 5%	0,0	§
1981	15,2	1991	1,0	1,0	1,3	3% - 5%	2,0	Ω
1982	15,5	1992	1,3	1,3	1,0	0% - 2%	0,0	§
1983	6,9	1993	1,4	1,4	0,9	0% - 2%	0,0	§
1984	6,2	1994	2,8	2,8	0,5	0% - 2%	0,8	Ω
1985	15,3	1995	2,9	2,9	0,6	0% - 2%	0,9	Ω
1986	18,2	1996	2,6	2,6	0,3	0% - 2%	0,6	Ω
1987	9,6	1997	0,8	0,8	1,5	0% - 3%	0,0	§
1988	4,7	1998	0,4	0,4	1,9	0% - 3%	0,0	§
1989	7,2	1999	0,5	0,5	1,8	0% - 3%	0,0	§
Pre-IT average	11,6	2000	4,0	4,0	1,7	0% - 3%	1,0	Ω
		2001	2,6	2,6	0,3	0% - 3%	0,0	§
		2002	2,7	2,7	0,4	1% - 3%	0,0	§
		2003	1,8	1,8	0,5	1% - 3%	0,0	§
		2004	2,3	2,3	0,0	1% - 3%	0,0	§
		2005	3,0	3,0	0,7	1% - 3%	0,1	Ω
		2006	3,4	3,4	1,1	1% - 3%	0,4	Ω
		2007	2,4	2,4	0,1	1% - 3%	0,0	§
		2008	4,0	4,0	1,7	1% - 3%	1,0	Ω
		2009	2,1	2,1	0,2	1% - 3%	0,0	§
		Post-IT average	2,3	$\bar{x}$ = 2,3	MAD = 1,0		Average = 0,3	8/20 or 40,0%

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.1.2 *Target achievement*

Figure 5.1A shows New Zealand performance in terms of achieving the set targets. According to Figure 5.1A, inflation fell to the target-zone promptly and has stayed within or close to the target range in most of the times during the inflation-targeting period. In fact, the average inflation rate deviated from the set targets by 0,3% during the inflation-targeting period. Moreover, about 60,0% of the time, actual inflation remained within the target band. Nevertheless, 40,0% of target misses were also

recorded during the inflation-targeting period and three out of eight target misses were in the range of large target misses, that is, where the actual inflation rate was higher or below the target range by 1,0% or more during the inflation-targeting period (see Table 5.1). Based on this performance, New Zealand ranks fifth among the inflation-targeting countries (see Figure 5.25 in the Appendix A).

Figure 5.1A: The inflation targets and actual rates in New Zealand

Years	1990 - 1991	1992 - 1996	1997 - 2001	2002 - 2010
Targets	3% - 5%	0% - 2%	0% - 3%	1% - 3%

Sources: Statistics New Zealand, Reserve Bank of New Zealand and Bloomberg
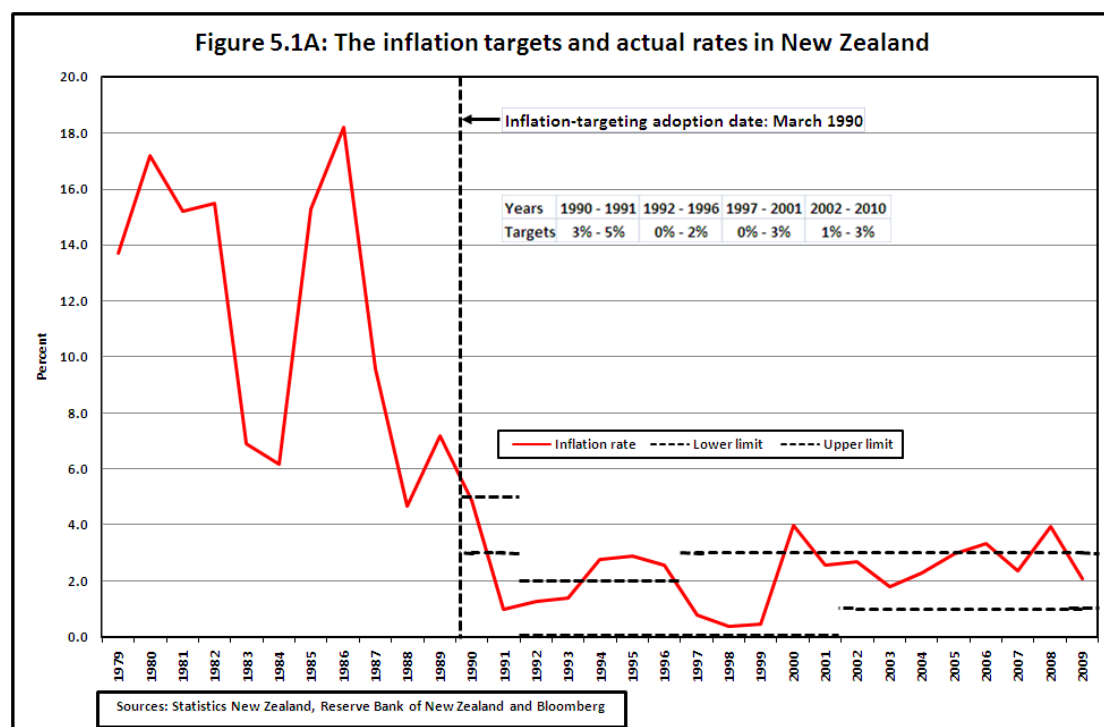
5.2.1.3 *Economic growth, unemployment and interest rates*

Figure 5.1B suggests that, after 20 years of inflation targeting, the macroeconomic performance of New Zealand has been positive, relative to its experience during the 1980s. During the inflation-targeting period, New Zealand experienced higher and longer-lived economic growth that increased on average from 1,8% recorded from 1980 to 1989, to 2,8% during the inflation-targeting period. The unemployment rate, however, increased by 1,3% during the same period while interest rates declined significantly from 14,6% to approximately 6,0%. Moreover, there was a reduction in

broader macroeconomic volatility. This macroeconomic performance ensured that New Zealand was comparable with other industrialised countries. Johnson (2003), Ranchhod (2003) and Groeneveld *et al.* (1998) presented similar results.

Figure 5.1B: The macroeconomic variables in New Zealand

Source: World Economic Outlook Database (WEO) and International Financial Statistics (IFS)
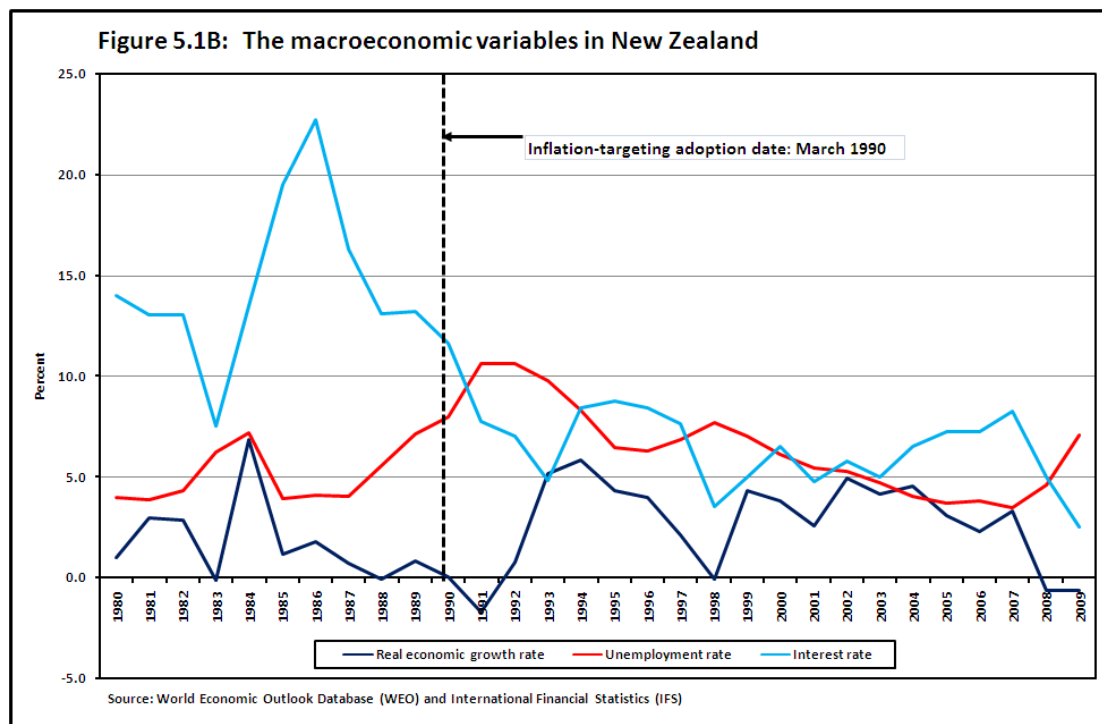
5.2.2 Canada

Canada was the second country, after New Zealand, to set out formal, medium-term inflation targets. Entry to inflation targeting was prompted by the failure of monetary targeting rather than as a result of a pressing need for fundamental structural changes. An implicit inflation-targeting approach was followed since 1988 when Governor John Crow made the case of lowering inflation towards the longer run objective of price stability (Crow 1988). A full-fledged inflation-targeting framework was formally adopted in February 1991 (Paulin 2006; Collins & Siklos 2004).

5.2.2.1 *Lowering the inflation rate*

Following the initial announcement of the inflation targets in Canada, inflation declined rapidly and has been significantly lower on average than it was before the inflation-targeting framework was implemented. Table 5.2 confirms that the average inflation rate declined from 6,4% experienced 11 years prior to the adoption of inflation targeting to 2,0%, consistent with price stability during the inflation-targeting period. These developments suggest that inflation targeting has proven to be an effective and efficient way of reducing and keeping inflation low and stable. Furthermore, the actual inflation rate mean absolute deviation during the inflation-targeting period averaged 0,7%, suggesting a better performance of inflation volatility when compared with that of New Zealand. Arestis *et al.* (2002) also presented a better inflation performance in Canada in their analysis of the situation.

Table 5.2: The inflation rate in Canada

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	10,1	1991	5,6	5,6	3,6	3% - 5%	0,6	Ω
1981	12,5	1992	1,5	1,5	0,5	2% - 4%	0,5	Ω
1982	10,8	1993	1,9	1,9	0,1	2% - 4%	0,1	Ω
1983	5,9	1994	0,1	0,1	1,9	1,5% - 3,5%	1,4	Ω
1984	4,3	1995	2,2	2,2	0,2	1% - 3%	0,0	§
1985	4,0	1996	1,6	1,6	0,4	1% - 3%	0,0	§
1986	4,2	1997	1,6	1,6	0,4	1% - 3%	0,0	§
1987	4,4	1998	1,0	1,0	1,0	1% - 3%	0,0	§
1988	4,0	1999	1,7	1,7	0,3	1% - 3%	0,0	§
1989	5,0	2000	2,7	2,7	0,7	1% - 3%	0,0	§
1990	4,8	2001	2,5	2,5	0,5	1% - 3%	0,0	§
Pre-IT average	6,4	2002	2,3	2,3	0,3	1% - 3%	0,0	§
		2003	2,7	2,7	0,7	1% - 3%	0,0	§
		2004	1,8	1,8	0,2	1% - 3%	0,0	§
		2005	2,2	2,2	0,2	1% - 3%	0,0	§
		2006	2,0	2,0	0,0	1% - 3%	0,0	§
		2007	2,1	2,1	0,1	1% - 3%	0,0	§
		2008	2,4	2,4	0,4	1% - 3%	0,0	§
		2009	0,3	0,3	1,7	1% - 3%	0,9	Ω
		Post-IT average	2,0	$\bar{x}$ = 2,0	MAD = 0,7		Average = 0,2	5/19 or 26,3%

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.2.2   *Target achievement*

Figure 5.2A depicts Canada's inflation-targeting performance. It highlights that the actual inflation rate in Canada remained largely within or closer to a 1,0% – 3,0% target range ever since it became an official target (also see Table 5.2). Moreover, the average deviation of the inflation rate from the target is 0,2%. Furthermore, the set inflation targets achieved during the inflation-targeting period equal 73,7%. Nevertheless, one large target miss was recorded during the inflation-targeting period, that is, in 1994. However, target misses averaged around 26,3% in almost two decades of Canada's inflation-targeting experience (see Table 5.2). As a result of

these performances, Canada has achieved one of the best performances of the inflation-targeting framework among industrialised countries. According to Figure 5.25 in the Appendix A, it ranks third among the best inflation-targeting performers.

Figure 5.2A: The inflation targets and actual rates in Canada

Sources: Statistics Canada, Bank of Canada and Bloomberg
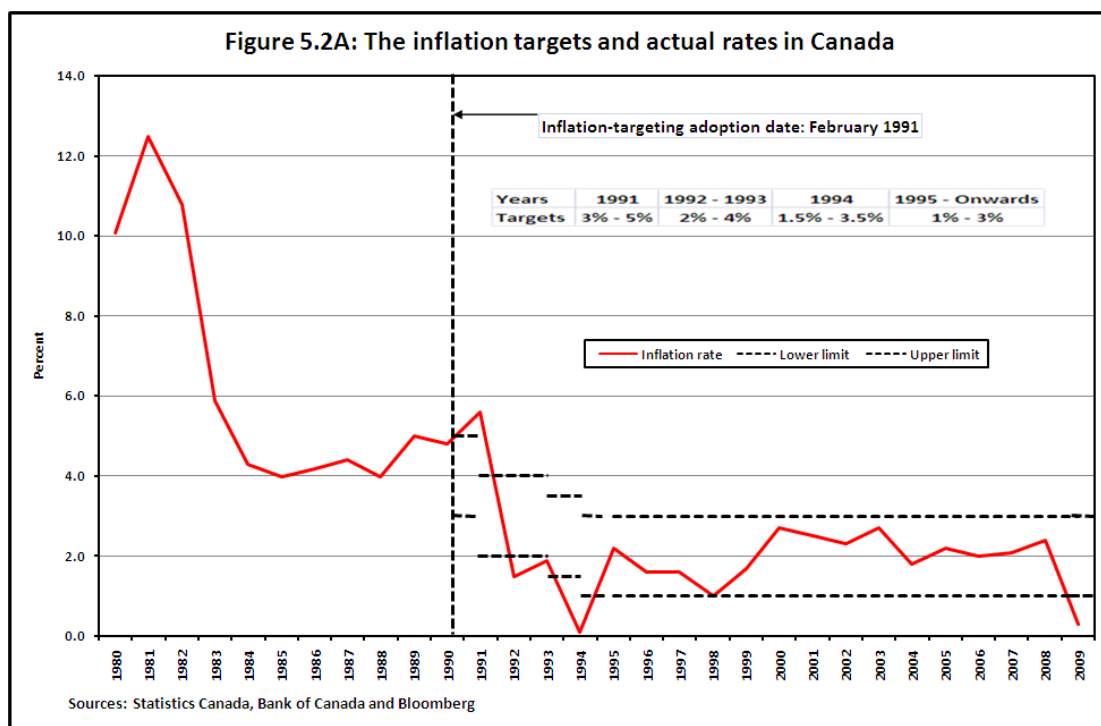
5.2.2.3   *Economic growth, unemployment and interest rates*

The Bank of Canada and many academics contend that inflation targeting has contributed to the improved macroeconomic economic performance of Canada (Dodge 2002). This is because major benefits that an inflation-targeting framework was supposed to deliver had been realised and, in some cases, exceeded. Figure 5.2B reveals that on the real side of the economy, economic growth on average has been generally higher and significantly more stable over the inflation-targeting period than compared to the previous decade – 1980s. The dismal performance of the country regarding its rate of unemployment also changed with the adoption of an

inflation-targeting framework, declining from an average of 9,3% from 1980 to 1990 to 8,3% during the inflation-targeting period, that is, from 1991 to 2009. Canada is among the inflation-targeting countries that have experienced a significant reduction in interest rates during the inflation-targeting period. Interest rates declined from 11,6% recorded from 1980 to 1990 to 4,0% during the inflation-targeting period. Moreover, Canada has on average experienced a reduction in the volatility of its macroeconomic variables during the inflation-targeting period. Similar results can be found in the research of, among others, Thiessen (1998), and Lin and Ye (2007).

Figure 5.2B: The macroeconomic variables in Canada

Source: World Economic Outlook Database and Bank of Canada
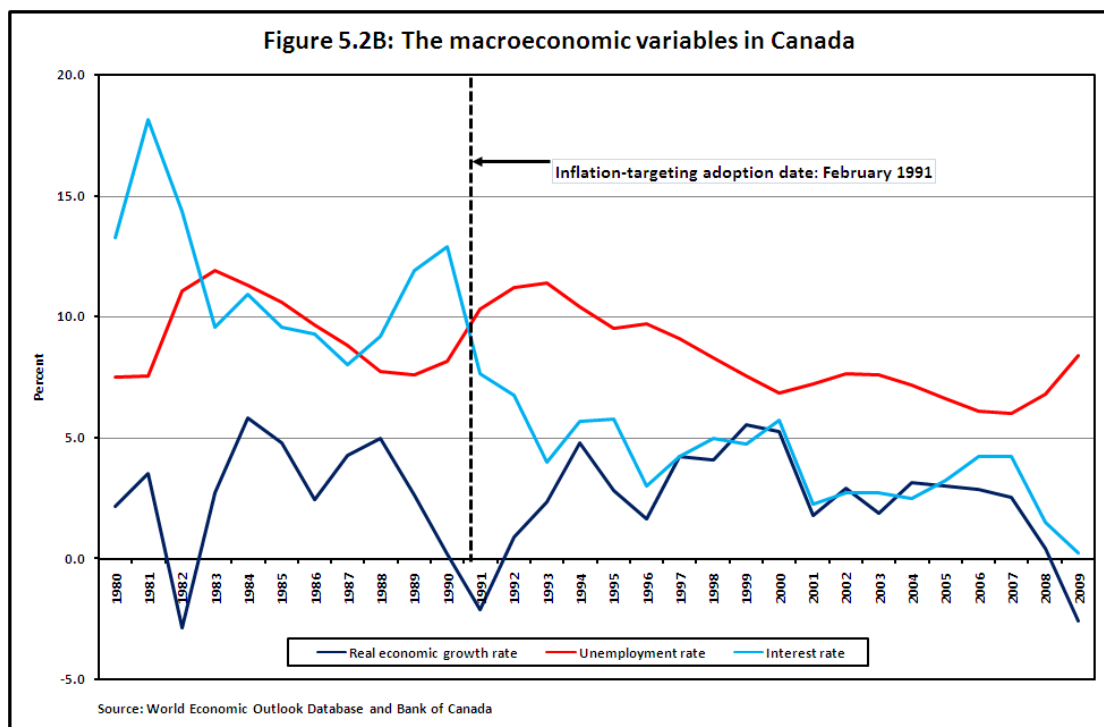
5.2.3 The United Kingdom

With the experience of the 1980s and 1990s ruling out the return to monetary and exchange-rate targeting as credible policy alternatives, the next phase in the monetary policy of the UK was a shift to a framework of inflation targeting. Indeed, the UK was one of the early followers of the inflation-targeting framework, introducing

an inflation target soon after the departure of the country from the ERM in September 1992 (see Taylor & Davradakis 2006; Drake & Fleissig 2006; Srinivasan *et al.* 2006). Initially, the Bank of England (BOE) targeted an inflation range, but then, since 1997, shifted to a point target with a tolerance level of 1,0% on either side of the target point (see Table 5.3).

5.2.3.1 Lowering the inflation rate

Table 5.3 suggests that, after the adoption of the inflation-targeting framework, the average inflation rate improved significantly and reached the lowest rates in decades. During the inflation-targeting period, the actual inflation rate averaged 2,1%, declining from an averaged of 7,0% experienced more than a decade prior to the adoption of the inflation-targeting framework. The mean absolute deviation during the inflation-targeting period averaged 0,6%, suggesting that inflation volatility has been lower when viewed in the contexts of the past performance of the UK, Canada and New Zealand (see Table 5.25 in the Appendix B section). Arestis and Sawyer (2002), and Bean (1998) also highlight the good inflation performance of the UK during its inflation-targeting period.

Table 5.3: The inflation rate in the UK

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1980	16,8	1992	4,3	4,3	2,2	1% - 4%	0,3	Ω
1981	12,2	1993	2,5	2,5	0,4	1% - 4%	0,0	§
1982	8,5	1994	2,1	2,1	0,0	1% - 4%	0,0	§
1983	5,2	1995	2,6	2,6	0,5	1% - 4%	0,0	§
1984	4,4	1996	2,4	2,4	0,3	1,5% - 3,5%	0,0	§
1985	5,2	1997	1,8	1,8	0,3	1% - 3%	0,0	§
1986	3,6	1998	1,6	1,6	0,5	1% - 3%	0,0	§
1987	4,1	1999	1,3	1,3	0,8	1% - 3%	0,0	§
1988	4,6	2000	0,9	0,9	1,2	1% - 3%	0,1	Ω
1989	5,2	2001	1,2	1,2	0,9	1% - 3%	0,0	§
1990	7,0	2002	1,3	1,3	0,8	1% - 3%	0,0	§
1991	7,4	2003	1,4	1,4	0,7	1% - 3%	0,0	§
Pre-IT average	7,0	2004	1,3	1,3	0,8	1% - 3%	0,0	§
		2005	2,0	2,0	0,1	1% - 3%	0,0	§
		2006	2,3	2,3	0,2	1% - 3%	0,0	§
		2007	2,3	2,3	0,2	1% - 3%	0,0	§
		2008	3,6	3,6	1,5	1% - 3%	0,6	Ω
		2009	2,2	2,2	0,1	1% - 3%	0,0	§
		Post-IT average	2,1	$\overline{x}$ = 2,1	MAD = 0,6		Average = 0,1	3/18 or 16,7%

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.3.2   *Target achievement*

According to Figure 5.3A, the actual inflation rate of the UK remained within the target range during most of the inflation-targeting period, that is, approximately 83,3% of the inflation-targeting period. Nonetheless, target misses averaging 16,7% were also recorded during the inflation-targeting period. However, large target misses were not encountered in almost two decades of the inflation-targeting experience of the country. Moreover, the inflation rate in the UK has, on average, deviated from the set targets by 0,1% during the inflation-targeting period (see Table 5.3). These performances are better than those of New Zealand and Canada despite the fact that

these two countries have had more experience with the inflation-targeting framework (see Table 5.25). As a result of an outstanding performance, the UK ranks second among the best inflation-targeting performers (see Figure 5.25 in the Appendix A section).

Figure 5.3A: The inflation targets and actual rates in the UK

Sources: Office of National Statistics, Bank of England and Bloomberg
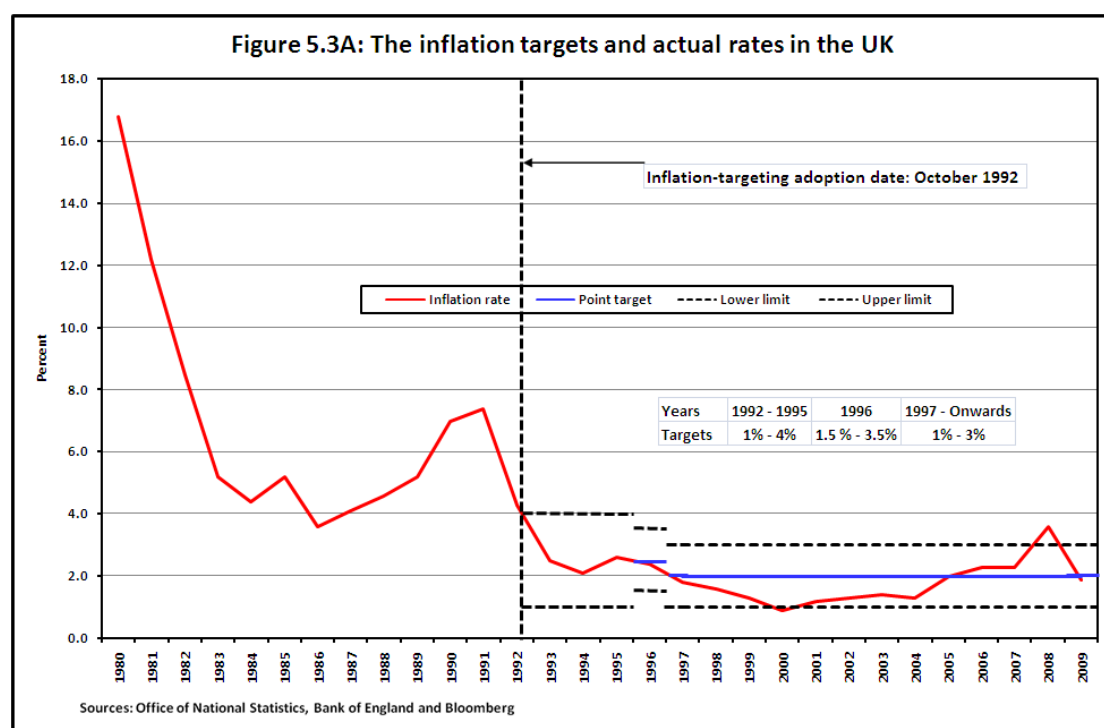
5.2.3.3 *Economic growth, unemployment and interest rates*

Economic experience under the inflation-targeting framework in the UK has been very favourable, and macroeconomic performances since the inception of inflation targeting have probably exceeded the expectations of most commentators. Throughout the inflation-targeting period, the macroeconomic performance of the UK has been characterised by unprecedented economic stability. Therefore, the success of the inflation-targeting framework in the UK has been a key factor in the macroeconomic stability over the last decade. Figure 5.3B highlights that economic growth has been remarkably steady to trend and higher than the UK historic average.

Economic growth averaged higher at 2,3% during the inflation-targeting period from 2,0% recorded in 1980 to 1991. Moreover, the rate of unemployment continued to drop during the inflation-targeting period, reaching rates last seen in the early 1970s. The average rate of unemployment decline from 9,6% recorded in 1980 to 1992, to 6,7% during the inflation-targeting period. As it took less monetary-policy tightening to obtain a favourable inflation outcome during the inflation-targeting period, the interest rate declined to historical rates of closer to 5,0% and remained lower throughout the targeting period. Further evidence on the favourable macroeconomic performances of inflation targeting in the UK can be found in, but not limited to, Benati (2005), Mereno *et al.,* (2006), Allsop *et al.,* (2006) and Artis *et al.,*(1998).

Figure 5.3B: The macroeconomic variables in the UK

Sources: Bank of England and Bloomberg
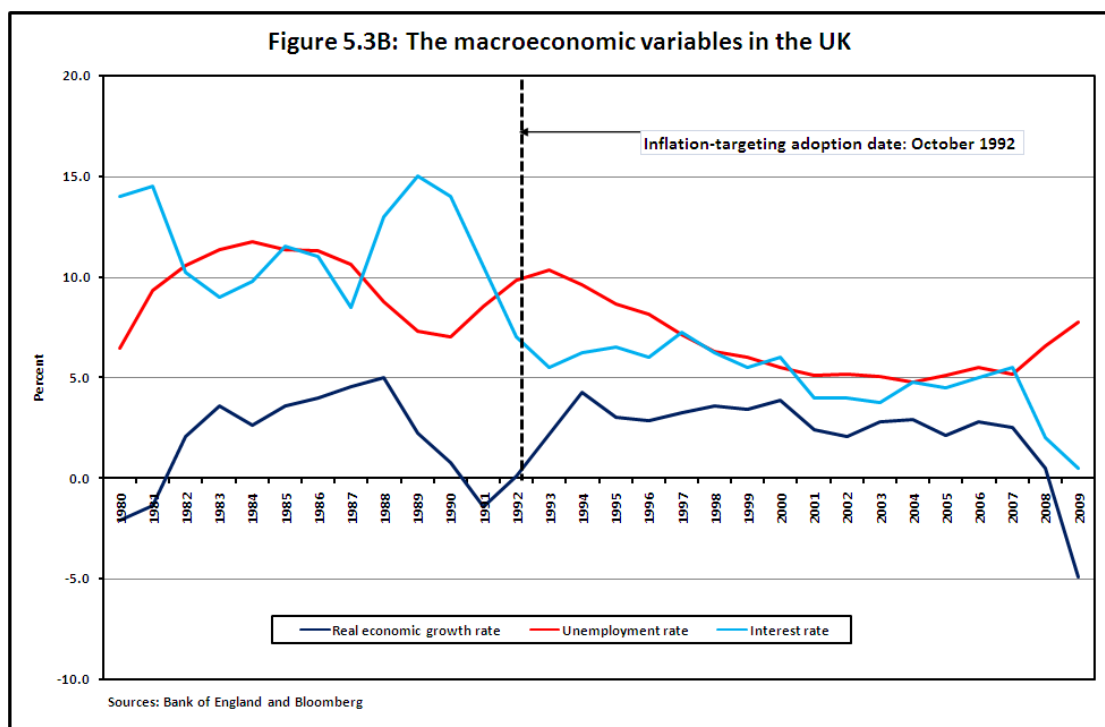
5.2.4 Sweden

Sweden was among the first countries to adopt inflation targeting in the first half of the 1990s soon after its fixed exchange-rate regime was abandoned due to a

credibility loss in November 1992. In January 1993, the governing board of the Riksbank adopted a full-fledged inflation-targeting framework (Paulin 2006; Svensson 1995). However, in 1993 as well as 1994, its monetary policy was aimed at preventing the inflationary impulse due to the depreciation of the kroner and changes in indirect taxes from causing an increase in the inflation rate. Thus, the Riksbank stated that the target for monetary policy would not be applied until 1995 (*Sveriges Riksbank Press Release* 1993).

5.2.4.1 *Lowering the inflation rate*

Table 5.4 indicates that, since the start of the inflation-targeting framework, Sweden has achieved a remarkable decline in its inflation rate. On average, inflation declined from 8,1% experienced 12 years prior to the adoption of an inflation targeting to 1,8% during the inflation-targeting period. Thus, the high inflation economy with recurring cost crises became issues of the past during the inflation-targeting period. Moreover, the mean absolute deviation during the inflation-targeting period was 0,9%, suggesting that, in addition to low inflation during the targeting period, inflation was more stable than was the case under the previous monetary-policy regimes.

Table 5.4: The inflation rate in Sweden

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	17,5	1993	4,8	4,8	3,0			
1981	12,1	1994	2,2	2,2	0,4			
1982	8,6	1995	2,6	2,6	0,8	1% - 3%	0,0	§
1983	8,9	1996	1,0	1,0	0,8	1% - 3%	0,0	§
1984	8,0	1997	1,8	1,8	0,0	1% - 3%	0,0	§
1985	7,4	1998	1,0	1,0	0,8	1% - 3%	0,0	§
1986	4,2	1999	0,5	0,5	1,3	1% - 3%	0,5	Ω
1987	4,2	2000	1,3	1,3	0,5	1% - 3%	0,0	§
1988	5,8	2001	2,7	2,7	0,9	1% - 3%	0,0	§
1989	6,4	2002	1,9	1,9	0,1	1% - 3%	0,0	§
1990	10,5	2003	2,3	2,3	0,5	1% - 3%	0,0	§
1991	9,3	2004	1,0	1,0	0,8	1% - 3%	0,0	§
1992	2,3	2005	0,5	0,5	1,3	1% - 3%	0,2	Ω
Pre-IT average	8,1	2006	1,4	1,4	0,4	1% - 3%	0,0	§
		2007	2,2	2,2	0,4	1% - 3%	0,0	§
		2008	3,4	3,4	1,6	1% - 3%	0,3	Ω
		2009	-0,3	-0,3	2,1	1% - 3%	0,7	Ω
		Post-IT average	1,8	$\bar{x}$ = 1,8	MAD = 0,9		Average = 0,1	4/15 or 26,7%

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.4.2 *Target achievement*

Figure 5.4A illustrates that the actual inflation rate remained within or below the target band in most part of the inflation-targeting period. In fact, the inflation rate was within the targeted band in 73,3% of the time during the inflation-targeting period. Although 26,7% of the inflation-targeting experience of the country consists of target misses, no large target miss was encountered during the same period. Smaller average deviation of the inflation rate from the set targets of 0,1% confirms this point, thereby placing Sweden on par with the average of the UK (see Table 5.26 in the Appendix C section). Moreover, this average confirms the good performance of the

country in terms of target achievement, following Canada in the ranks of best inflation-targeting performers. Thus, Sweden ranks fourth among the best inflation-targeting performers.

Figure 5.4A: The inflation targets and actual rates in Sweden

Source: World Economic Outlook Database
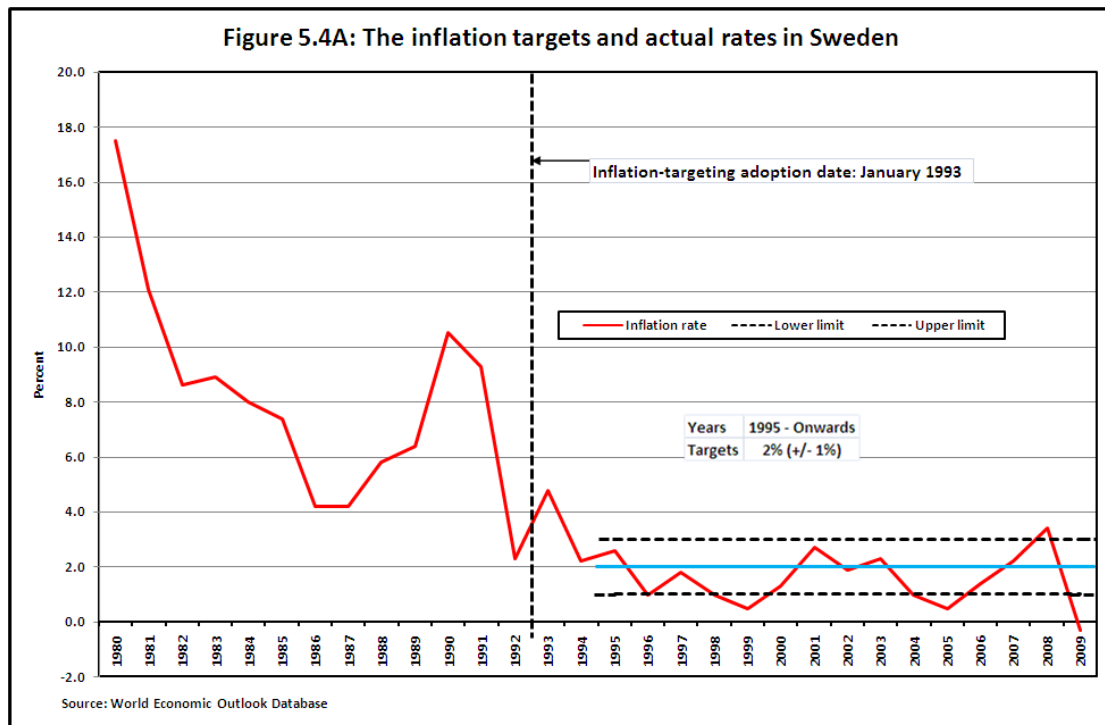
5.2.4.3 *Economic growth, unemployment and interest rates*

Inflation targeting has been a fruitful strategy and has lived up to its expectations in Sweden. The evaluation of monetary policy indicates that the Riksbank compares favourably with the best central banks in the world, and that monetary policy performance has greatly improved from that which occurred prior to the adoption of the inflation-targeting framework, that is, 1980s (Berg 2000). The inflation-targeting strategy contributed to the economy of the country by providing stability in its economic policy that was lacking in the 1970s and 1980s. It has given Sweden the steadiness and stability to economic policy that was lacking before.

Figure 5.4B divulges that since the start of the inflation-targeting framework, high interest rates and an unstable economic growth became the things of the past. The Swedish economy experienced better and stable economic growth under the inflation-targeting framework. Economic growth averaged 2,2% during the inflation-targeting period when compared with 1,9% experienced in more than a decade ago. However, this favourable trend in economic growth after the implementation of the inflation-targeting framework failed to reduce the rate of unemployment. In fact, the rate of unemployment increased significantly from an average of 1,9% in 1980 to 1992, to 7,3% in during the targeting period. However, there was a marked improvement in the average interest rate during the inflation-targeting period that declined from the 10,1% experienced from 1980 to 1992 to 3,9%. Thus, the pace of the interest rate decline accelerated after the adoption of an inflation-targeting framework while interest-rate volatility was lower during the same period when compared to the previous decade. Therefore interest rates remained low and stable by historical standards during the inflation-targeting period. Berg and Grottheim (1997) also present similar macroeconomic performance in their analysis of the situation.

Figure 5.4B: The macroeconomic variables in Sweden

Sources: World Economic Outlook Database, Sveriges Riksbank and Bloomberg
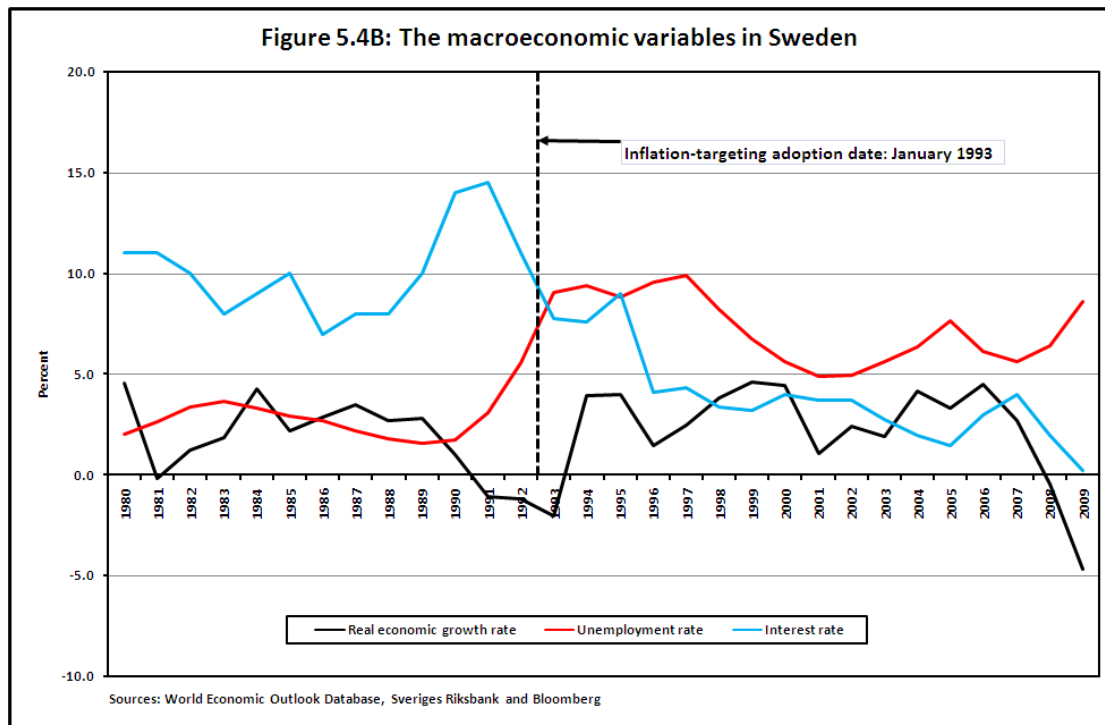
5.2.5 Australia

The adoption of inflation targeting in Australia followed a relatively informal process. Australia shifted toward informal inflation targeting as early as 1989, when the Reserve Bank of Australia (RBA), altered its rhetoric and actions towards achieving low inflation (Stevens 2003). A formal inflation-targeting framework was adopted in March 1993 when Governor Bernie Fraser began to speak of the objective of holding the inflation rate of 2,0% to 3,0% over the course of the cycle (Ahn 2004; Bharucha & Kent 1998).

5.2.5.1   Lowering the inflation rate

Table 5.5 proposes that substantial progress in keeping inflation low has been made and continues to be made in Australia. The average inflation rate declined from 7,4% experienced in 1980 to 1992 to 2,7% during the inflation-targeting period. However,

along with that of New Zealand, the mean absolute deviation of Australia averaged 1,0%, suggesting higher inflation volatility during the targeting period.

Table 5.5: The inflation rate in Australia

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1980	10,2	1993	1,8	1,8	0,9	2% - 3%	0,2	Ω
1981	9,6	1994	1,9	1,9	0,8	2% - 3%	0,1	Ω
1982	11,2	1995	4,6	4,6	1,9	2% - 3%	1,6	Ω
1983	10,1	1996	2,6	2,6	0,1	2% - 3%	0,0	§
1984	3,9	1997	0,3	0,3	2,4	2% - 3%	1,7	Ω
1985	6,7	1998	0,9	0,9	1,8	2% - 3%	1,1	Ω
1986	9,1	1999	1,5	1,5	1,2	2% - 3%	0,5	Ω
1987	8,5	2000	4,5	4,5	1,8	2% - 3%	1,5	Ω
1988	7,3	2001	4,4	4,4	1,7	2% - 3%	1,4	Ω
1989	7,5	2002	3,0	3,0	0,3	2% - 3%	0,0	§
1990	7,3	2003	2,8	2,8	0,1	2% - 3%	0,0	§
1991	3,2	2004	2,3	2,3	0,4	2% - 3%	0,0	§
1992	1,0	2005	2,7	2,7	0,0	2% - 3%	0,0	§
Pre-IT average	7,4	2006	3,5	3,5	0,8	2% - 3%	0,5	Ω
		2007	2,3	2,3	0,4	2% - 3%	0,0	§
		2008	4,4	4,4	1,7	2% - 3%	1,4	Ω
		2009	1,8	1,8	0,9	2% - 3%	0,2	Ω
		Post-IT average	2,7	$\overline{x}$ = 2,7	MAD = 1,0		Average = 0,6	11/17 or 64,7%

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.5.2 Target achievement

Figure 5.5A demonstrates that, among industrialised countries, Australia has a poor performance of achieving the set inflation targets during the inflation-targeting period. This is evident from the fact that during the inflation-targeting period, 35,3% of the targeting period represents target achievement while 64,7% represent target misses. Moreover, six large target misses were recorded during the same period and, as a

result, the average inflation-rate deviation of 0,6% from the set targets was recorded. This average doubles or more than doubles the averages experienced in New Zealand (0,3%); Canada (0,2%); and Sweden (0,1%). In fact, the average of Australia equals to the total averages of all three countries mentioned (see Table 5.26 in the Appendix C section). As a result of its poor inflation-targeting achievement, Australia ranks 11th among the rest of the inflation-targeting countries (see Figure 5.25 in the Appendix A section).

Figure 5.5A: The inflation targets and actual rates in Australia

Source: World Economic Outlook Database
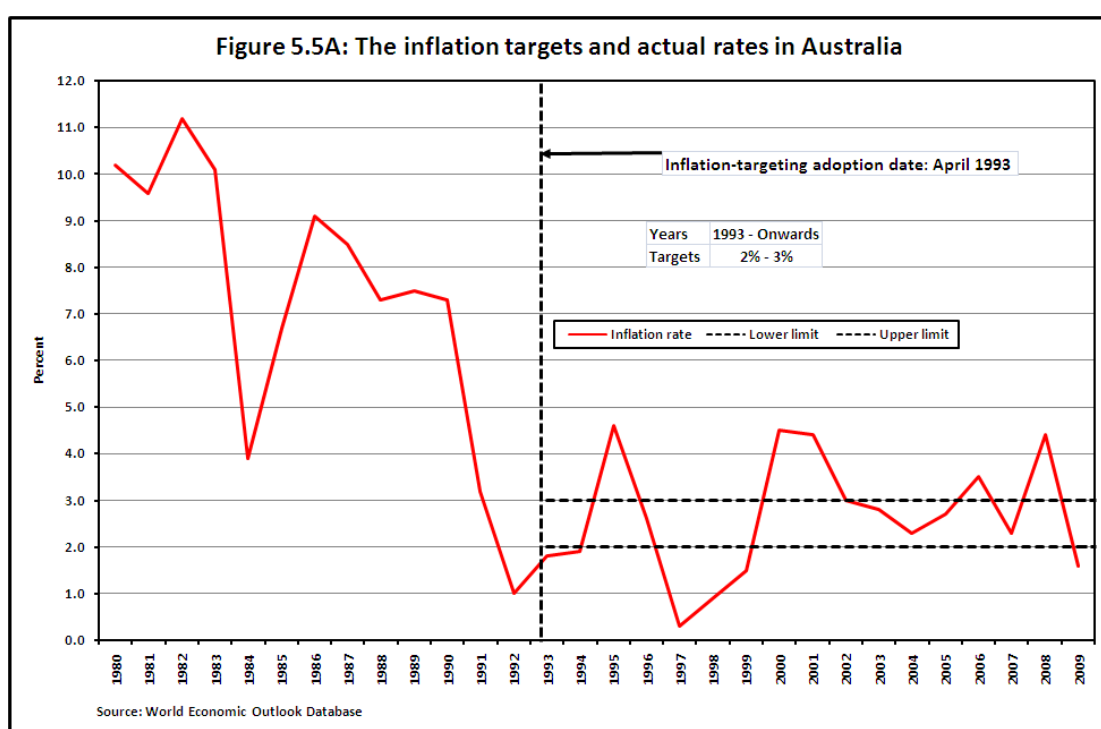
5.2.5.3   *Economic growth, unemployment and interest rates*

Although Australia performed dismally in terms of target achievements, inflation targeting has been a successful model for monetary policy, perhaps better than the way in which it has served other inflation-targeting countries. Figure 5.5B illustrates that, since the adoption of the inflation-targeting framework, Australia is now a high economic growth, low-interest and unemployment-rate economy. Average economic

growth during the inflation-targeting period increased from 2,8% experienced 13 years prior to the adoption of the inflation-targeting framework to 3,6%. Moreover, this growth-rate performance has been equalled by few countries, has been very satisfactory, and lasted longer when compared with the outcomes under other monetary-policy regimes. Moreover, the Australian rate of unemployment decreased from an average of 7,9% recorded from 1980 to 1992, to 6,7% during the inflation-targeting period. Thus, the unemployment rate improved by 1,2% during the inflation-targeting period. Figure 5.5B further shows that the lower inflation environment allowed Australia to keep its interest rate low compared to its historical standard. The average interest rate declined from 12,3% experienced more than a decade prior to inflation targeting to 5,4% during the inflation-targeting period. Another benefit associated with inflation targeting in Australia is a greater degree of macroeconomic stability that was experienced since the adoption of the inflation-targeting framework. For more information on Australia's macroeconomic performance, consult Bell (2004) and Quiggin (2006).

Figure 5.5B: The macroeconomic variables in Australia

Sources: World Economic Outlook Database, Reserve Bank of Australia and Bloomberg
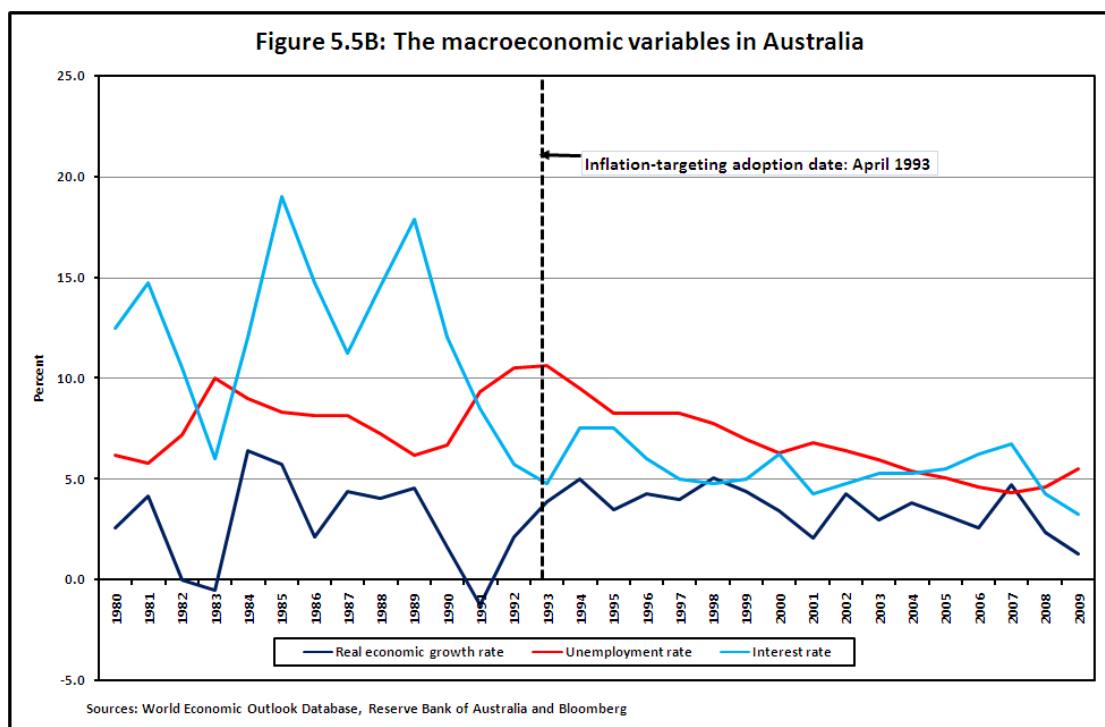
5.2.6 Israel

Israel implemented inflation targeting together with a widening exchange-rate band in December 1991 and abandoned the exchange-rate target in June 1997 when adopting a full-fledged inflation-targeting framework (Hu 2006; Roger & Stone 2005).

5.2.6.1   Lowering the inflation rate

Table 5.6 depicts how well the inflation-targeting framework served the Israeli economy in terms of lowering the inflation rate towards the rates experienced by major industrialised countries. This is illustrated in Table 5.6 that reveals that the average inflation rate between 1980 to 1996 was 84,5%, declining to 3,1% during the inflation-targeting period. This remarkable achievement was commended by the Bank of Israel (BoI). Although inflation declined significantly during the inflation-targeting period, the mean absolute deviation was higher at 2,3%, suggesting higher inflation volatility during the targeting period.

Table 5.6: The inflation rate in Israel

| Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	316,6	1997	9,0	9,0	5,9	7% - 10%	0,0	§
1981	33,3	1998	5,5	5,5	2,4	7% - 10%	1,5	Ω
1982	150,0	1999	5,2	5,2	2,1	4%	1,2	Ω
1983	105,0	2000	1,1	1,1	2,0	3% - 4%	1,9	Ω
1984	328,0	2001	1,1	1,1	2,0	3% - 4%	1,9	Ω
1985	306,0	2002	5,7	5,7	2,6	1% - 3%	2,7	Ω
1986	48,1	2003	0,7	0,7	2,4	1% - 3%	0,3	Ω
1987	19,6	2004	-0,4	-0,4	3,5	1% - 3%	1,4	Ω
1988	16,6	2005	1,3	1,3	1,8	1% - 3%	0,0	§
1989	20,1	2006	2,1	2,1	1,0	1% - 3%	0,0	§
1990	17,1	2007	0,5	0,5	2,6	1% - 3%	0,5	Ω
1991	19,1	2008	4,6	4,6	1,5	1% - 3%	1,6	Ω
1992	11,9	2009	3,3	3,3	0,2	1% - 3%	0,3	Ω
1993	11,0	Post-IT		$\bar{x}$	MAD		Average	10/13 or 76,9%
1994	12,3	average	3,1	= 3,1	= 2,3		= 1,0	
1995	10,0							
1996	11,3							
Pre-IT average	84,5							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.6.2   Target achievement

Although the inflation rate declined during the inflation-targeting period, the performance of the country in terms of target achievement tells a different story of continuous target misses. Figure 5.6A confirms this point by showing that Israel has the worst inflation-targeting performance, particularly when compared with other emerging-market countries. Inflation targets were continuously missed either by undershooting or overshooting the target ranges. In fact, inflation targets were missed ten out of 13 times or by 76,9%, while targets were achieved thrice out of 13 times, or by 23,1%. Moreover, seven large target misses were experienced during

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the targeting period and, as a result, the average deviation of the inflation rate from the set targets is 1,0% (see Table 5.6). This performance places Israel in the 14th position among inflation-targeting countries (see Figure 5.25 in the Appendix A section).

Figure 5.6A: The inflation targets and actual rates in Israel

Years	1997 - 1998	1999	2000 - 2001	2002 - Onwards
Targets	7% - 10%	4%	3% - 4%	1% - 3%

Source: World Economic Outlook Database
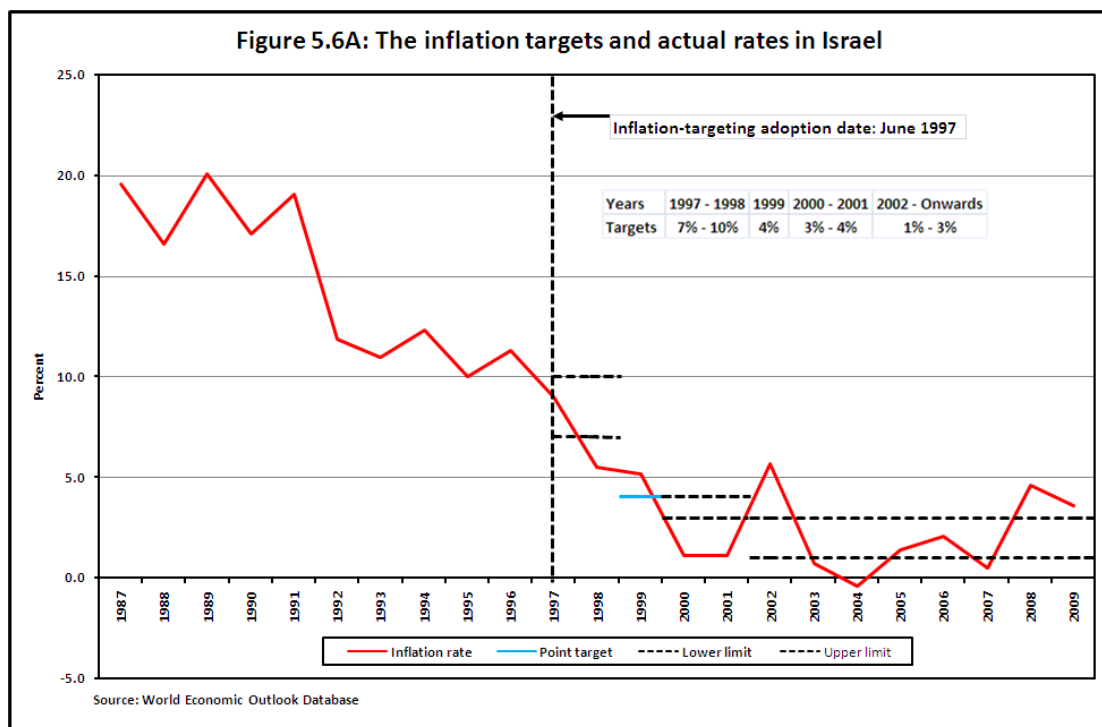
5.2.6.3 *Economic growth, unemployment and interest rates*

Although Israel adopted the inflation-targeting framework, other macroeconomic variables such as economic growth and unemployment did not respond positively. Figure 5.6B confirms this point and shows that an average economic growth was 4,7% between 1980 to 1996, declining to 3,5% during the targeting period. Nevertheless, this is still a remarkable performance given its experience during the recession of 2001 and 2002. However, the unemployment rate increased by 1,3% from 7,3% in 1980 to 1996, to 8,6% during the inflation-targeting period. The interest rate responded positively to an inflation-targeting framework. Figure 5.6B verifies that

the BoI has implemented a policy of reducing the interest rate in small steps since the introduction of the inflation-targeting framework. The cumulative reduction becomes quite substantial by 2008, resulting in a low interest-rate environment during the inflation-targeting period. In fact, the interest rate declined from double digits of more than 50,0% 17 years prior to inflation targeting to a single-digit rate closer to 6,0% during the inflation-targeting period. Moreover, the interest-rate volatility decreased when compared to the pre-inflation-targeting period. Among others, the *IMF Staff Country Report* (2000) highlights some the benefits of the inflation-targeting framework in Israel.

Figure 5.6B: The macroeconomic variables in Israel

Sources: World Economic Outlook Database, International Financial Statistics and Bloomberg
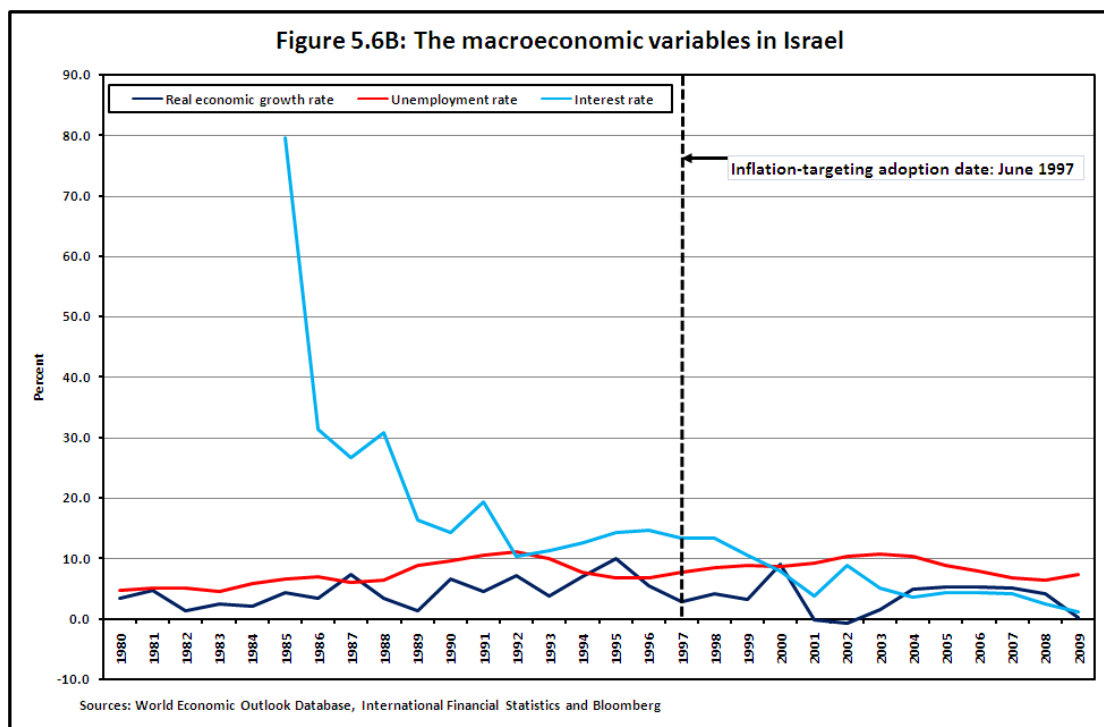
5.2.7 The Czech Republic

In January 1998, the Monetary Policy Council of the Czech National Bank (CNB) announced its decision to change its monetary policy to adopting an inflation-targeting framework (Daianu & Lungu 2007). With this announcement, the Czech

Republic became the first Central and Eastern European country or post-communist country to join a small but fast-growing club of countries in which monetary policy is implemented by directly targeting inflation with the aim of reducing inflation from high levels and then stabilising it. As a result, inflation targeting in the Czech Republic could not build on the experience of any other comparable economy (Holub & Hurnik 2008; Daianu & Lungu 2007). The switch by the CNB to a regime of inflation targeting was inspired by the experience of numerous countries that had implemented this framework earlier. Moreover, the choice of inflation targeting was a way out of a situation in which the economic and monetary policy had lost, following the exchange-rate turbulence, its nominal anchor in the form of the exchange-rate targeting (Tuma 2000; Cihak & Holub 1998). In this respect, the Czech Republic followed the experience of numerous countries that were forced to abandon a fixed exchange rate prior to introducing inflation targeting (Smidkova & Hrncir 2000; Matousek & Taci 2003).

5.2.7.1 *Lowering the inflation rate*

Although the CNB has had some partial failures, such as frequent non-fulfilment of its inflation targets, its twelve years' operation under an inflation-targeting framework has been a success, particularly in lowering inflation to the rates common in industrialised countries. The inflation rate declined from an average of 8,3% from 1980 to 1997, to 3,4% during the inflation-targeting period. However, the mean absolute deviation of inflation was higher at 2,0% during the inflation-targeting period (see Table 5.7). Even though inflation volatility declined during the inflation-targeting period when compared with inflation volatility under other monetary-policy frameworks, it was still higher than the averages experienced by other inflation-targeting countries, particularly in industrialised countries.

Table 5.7: The inflation rate in the Czech Republic

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	2,9	1998	10,7	10,7	7,3	5,5% - 6,5%	4,2	Ω
1981	0,8	1999	2,1	2,1	1,3	4% - 5%	1,9	Ω
1982	5,0	2000	3,8	3,8	0,4	3,5% - 5,5%	0,0	§
1983	0,9	2001	4,7	4,7	1,3	2% - 4%	0,7	Ω
1984	0,9	2002	1,9	1,9	1,5	3% - 5%	1,1	Ω
1985	2,3	2003	0,1	0,1	3,3	3% - 5%	2,9	Ω
1986	0,4	2004	2,8	2,8	0,6	3% - 5%	0,2	Ω
1987	0,1	2005	1,8	1,8	1,6	2% - 4%	0,2	Ω
1988	0,2	2006	2,5	2,5	0,9	2% - 4%	0,0	§
1989	1,4	2007	2,9	2,9	0,5	2% - 4%	0,0	§
1990	9,5	2008	6,3	6,3	2,9	2% - 4%	2,3	Ω
1991	56,6	2009	1,0	1,0	2,4	2% - 4%	1,0	Ω
1992	11,1	Post-IT		$\bar{x}$	MAD		Average	9/12 or 75,0%
1993	20,8	average	3,4	= 3,4	= 2,0		= 1,2	
1994	10,0							
1995	9,2							
1996	8,8							
1997	8,6							
Pre-IT average	8,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.7.2   Target achievement

A comparison of the targets defined by the CNB with actual inflation, as illustrated in Table 5.7 and Figure 5.7A, reveals that the actual inflation rate fluctuated far from the inflation target and was more frequently below the inflation target than above them. Moreover, the Czech Republic is one of the emerging-market economies with limited success in achieving set targets. Table 5.7 and Figure 5.7A corroborate this point and illustrate that inflation targets were achieved three out of 12 times (25,0%) while target misses occurred nine out of 12 times (75,0%). Moreover, six of nine target misses were large target misses, leading to a higher average inflation deviation from

the set targets of 1,2% during the targeting period. According to Figure 5.25 in the Appendix A section, which ranks the inflation-targeting performance of countries, the Czech Republic took 13th place.

Figure 5.7A: The inflation targets and actual rates in the Czech Republic

Years	1998	1999	2000	2001	2002 - 2004	2005	2006 - 2009	2010
Targets	5.5% - 6.5%	4% - 5%	3.5% - 5.5%	2% - 4%	3% - 5%	2% - 4%	3%	2%

Source: World Economic Outlook Database
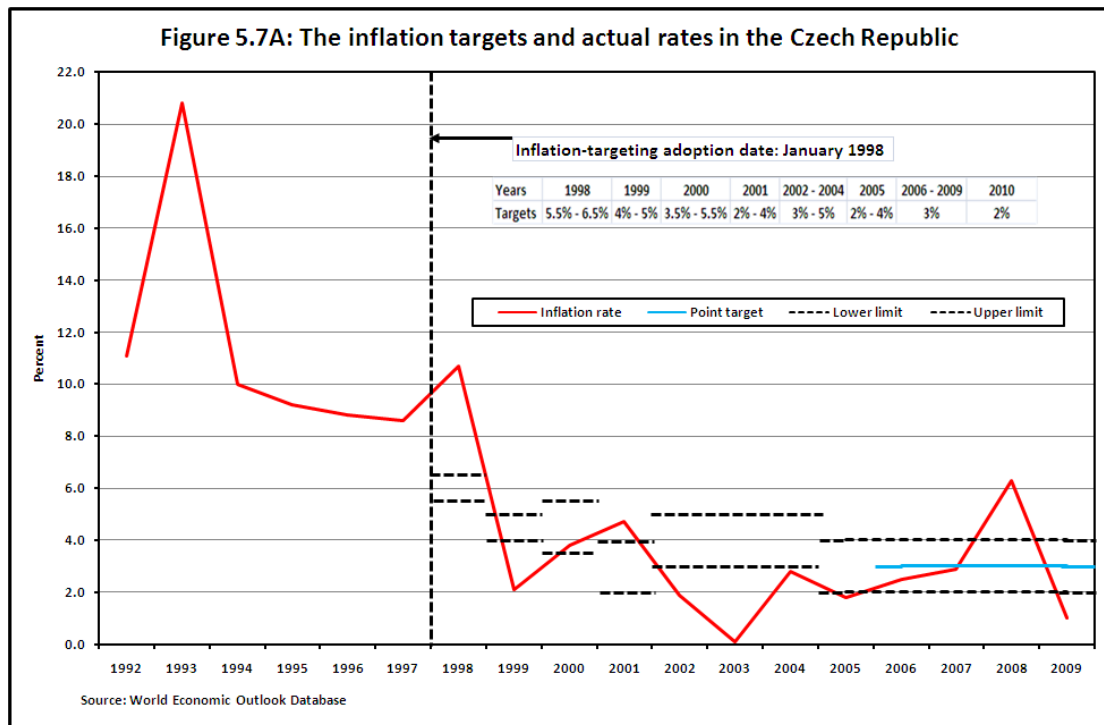
5.2.7.3   Economic growth, unemployment and interest rates

According to Figure 5.7B, the Czech Republic adopted the inflation-targeting framework when the economy was faced with a mild recession and economic recovery followed soon after the adoption of the inflation-targeting framework, gaining momentum or remaining positive throughout the inflation-targeting period. Average economic growth increased from 1,1% recorded from 1980 to 1997, to 3,0% during the inflation-targeting period. This growth performance was possible despite numerous adverse shocks, such as the oil price, to the economy. However, the unemployment rate increased during the inflation-targeting period to an average of 7,8% despite stronger economic growth performance during the same period. As far

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as the interest rate is concerned, Figure 5.7B verifies that it declined towards the adoption of the inflation-targeting framework and continued afterwards, reaching the lowest rate of 1,0% in 2009. On average, however, the interest rate was closer to 3,0% and mostly remained closer to this rate during the inflation-targeting period. Moreover, interest-rate volatility declined during the inflation-targeting period despite the fact that inflation targets were frequently missed in most of the times. Authors such as Roger and Stone (2005:45-47) can be consulted for more information on the Czech Republic's experience with inflation targeting.

Figure 5.7B: The macroeconomic variables in the Czech Republic

Source: World Economic Outlook Database, Czech National Bank and Bloomberg
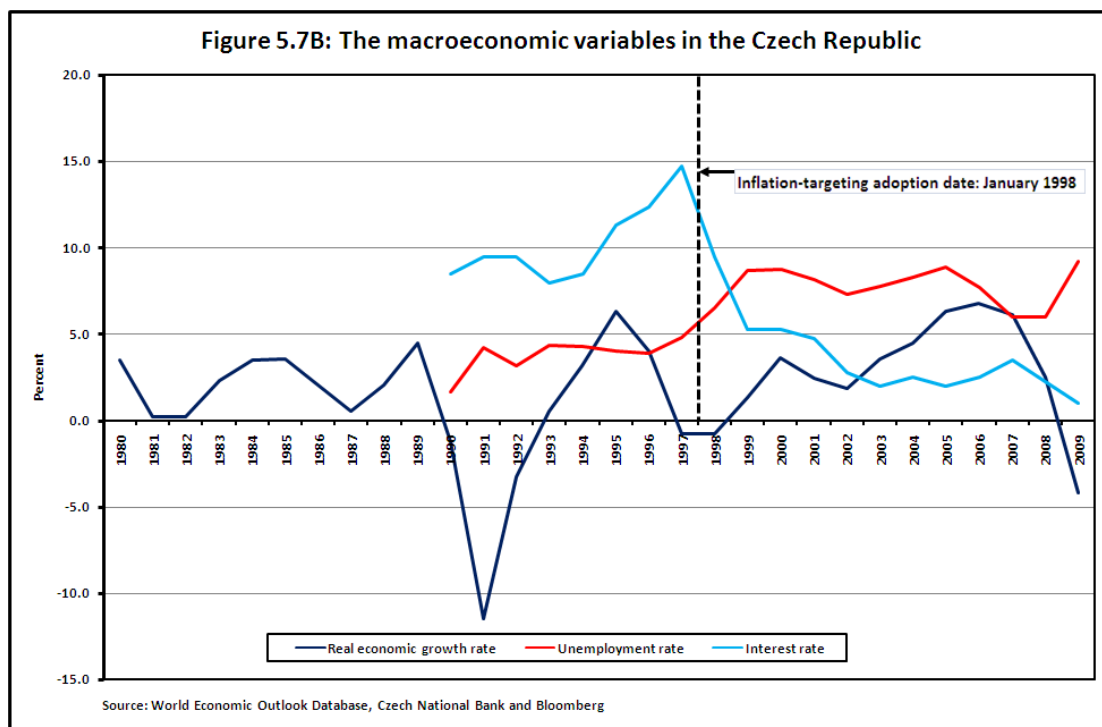
5.2.8 South Korea

South Korea was the first East Asian country to introduce an inflation-targeting framework (Levin *et al.* 2004). The inflation targeting was officially adopted in accordance with the revised Bank of Korea (BOK) Act, which came into effect on 1 April 1998 (Oh 2000; Kim & Park 2006).

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5.2.8.1   *Lowering the inflation rate*

Table 5.8 indicates that the average inflation rate in South Korea was much lower than before the inflation-targeting strategy was introduced. The inflation rate averaged 7,4% 18 years prior to the adoption of inflation targeting, declining to 3,3% during the inflation-targeting period. The mean absolute deviation of 1,2% compares better than the rates experienced by other emerging-market economies such as, among others, Ghana (3,0%) and Indonesia (2,8). Table 5.27 in the Appendix D section confirms this point. Nonetheless, inflation volatility decreased during the inflation-targeting period when compared to the period under other monetary-policy frameworks.

Table 5.8: The inflation rate in South Korea

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	28,7	1998	7,5	7,5	4,2	8% - 10%	0,5	Ω
1981	21,4	1999	0,8	0,8	2,5	2% - 4%	1,2	Ω
1982	7,2	2000	2,3	2,3	1,0	1,5% - 3,5%	0,0	§
1983	3,4	2001	4,1	4,1	0,8	2% - 4%	0,1	Ω
1984	2,3	2002	2,8	2,8	0,5	2% - 4%	0,0	§
1985	2,5	2003	3,5	3,5	0,2	2% - 4%	0,0	§
1986	2,8	2004	3,6	3,6	0,3	2,5% - 3,5%	0,1	Ω
1987	3,1	2005	2,8	2,8	0,5	2,5% - 3,5%	0,0	§
1988	7,1	2006	2,2	2,2	1,1	2,5% - 3,5%	0,3	Ω
1989	5,7	2007	2,5	2,5	0,8	2% - 4%	0,0	§
1990	8,6	2008	4,7	4,7	1,4	2% - 4%	0,7	Ω
1991	9,3	2009	2,8	2,8	0,5	2% - 4%	0,0	§
1992	6,2	Post-IT		$\bar{x}$	MAD		Average	6/12 or 50,0%
1993	4,8	average	3,3	= 3,3	= 1,2		= 0,2	
1994	6,3							
1995	4,5							
1996	4,9							
1997	4,4							
Pre-IT average	7,4							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.8.2 Target achievement

The inflation record of the country suggests that inflation targeting has been effective in sustaining price stability, and ensured that the inflation-targeting performance of South Korea was comparable with or exceeded the performances of industrialised countries. In fact, South Korea's performance in terms of target achievement is better than those of Australia and Iceland (see Figure 5.25 in the Appendix A section). Table 5.8 and Figure 5.8A demonstrate that the actual inflation rates remained within the target ranges of the inflation-targeting period half the time, thereby ensuring that Korea was one of the good inflation-targeting performers among emerging-market

economies. In half the target misses recorded, one large target miss was experienced during the targeting period. Moreover, the average deviation of the inflation rate from the set targets was 0,2%, a rate comparable with the averages of industrialised countries (see Table 5.25 in the Appendix B section). Along with Peru, Figure 5.25 in the Appendix A section ranks South Korea eighth among the inflation-targeting countries.

Figure 5.8A: The inflation targets and actual rates in South Korea

Years	1998	1999	2000	2001 - 2003	2004 - 2006	2007 - 2010
Targets	9%	3%	2.5%	3%	2.5% - 3.5%	3%

Inflation-targeting adoption date: April 1998

Source: World Economic Outlook Database
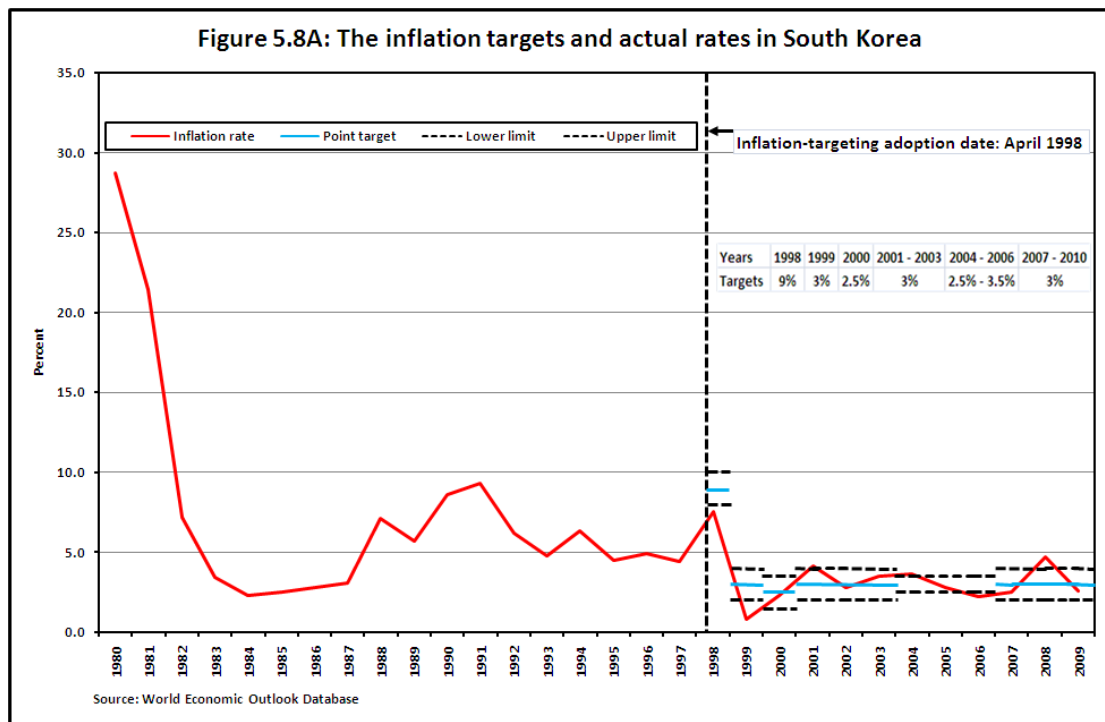
5.2.8.3   Economic growth, unemployment and interest rates

Figure 5.8B indicates that the inflation-targeting framework was adopted when the economy was faced with a severe recession emanating from the Asian crisis, but the effects of such a crisis on the economy were short lived as an economic upswing started in 1999, remaining positive during the most part of the inflation-targeting period. Nevertheless, lower average economic growth was experienced during the inflation-targeting period. In fact, economic growth declined from an average rate of

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7,6% from 1980 to 1997, to 3,9% during 1998 to 2009. Regarding the unemployment rate, Figure 5.8B suggests that it decreased immediately after the inflation-targeting framework was adopted, reaching the lowest rate of 3,2% recorded since statistics were being kept. Nevertheless, the rate of unemployment increased on average from 3,2% experienced 18 years prior to inflation targeting, to 4,1% during the inflation-targeting period. As a result of a lower inflation rate and inflation volatility, the inflation-targeting framework allowed interest rates to fall from an average of 6,8% seen 18 years prior to inflation targeting to 2,5% during the inflation-targeting period. In fact, the interest rate remained stable and closer to the average rate of 2,5% after the inflation-targeting framework had been adopted. Further experience covering inflation targeting in South Korea can also be found in, but not limited to, Condon (2006:168).

Figure 5.8B: The macroeconomic variables in South Korea

Sources: World Economic Outlook Database and International Financial Statistics (IFS)
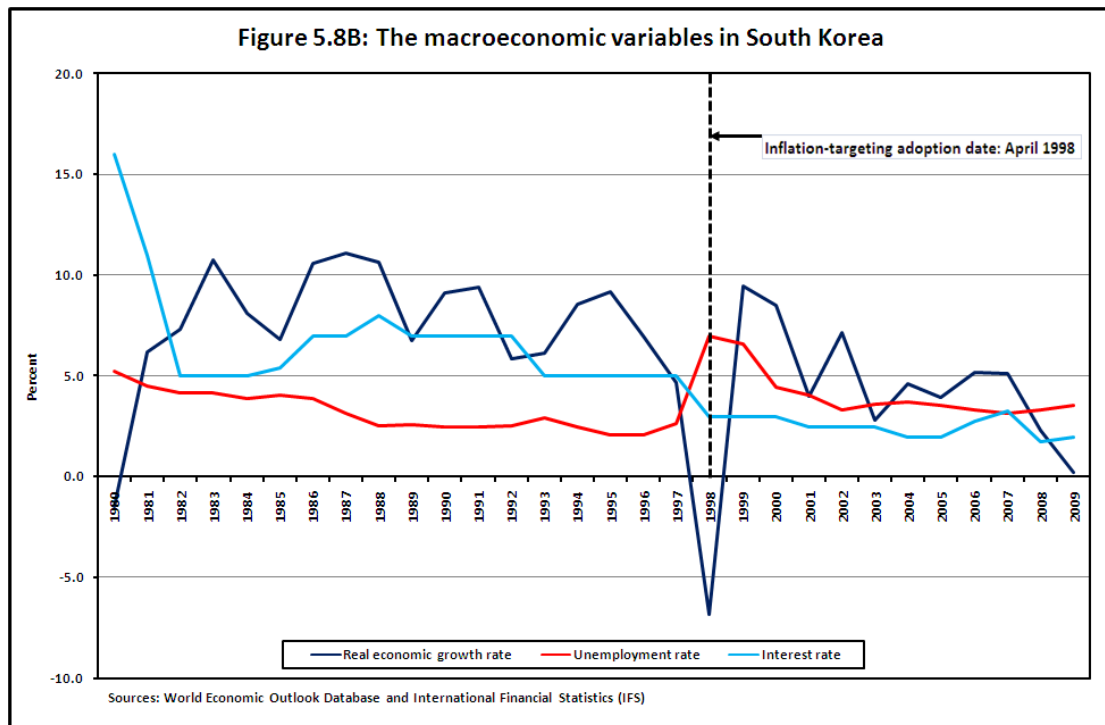
5.2.9 Poland

Poland, via their National Bank of Poland (NBP) and along with the CNB, was among the first emerging-market countries to adopt the inflation-targeting framework (Rybinski 2006). A partial inflation-targeting framework in Poland was introduced in 1997 to support disinflation, and the NBP officially adopted an inflation-targeting strategy at the beginning of 1999 (Polanski 2000; Levin *et al.* 2004). However, the inflation-targeting framework was introduced in Poland at a time when it was experiencing relatively higher inflation that stirred a heated debate over its timing, the exact format of the framework, and the overall rationale for introducing it. Critics regarded the introduction of an inflation-targeting policy in Poland as being premature since the average inflation rate in the country was 11,9%, and the relationship between inflation and other monetary-policy variables was highly unstable (Orlowski 2008).

5.2.9.1   *Lowering the inflation rate*

The inflation-targeting strategy has significantly contributed to lowering inflation and its volatility in Poland. Since the inflation-targeting framework was adopted, inflation decreased from an average rate of 75,8% recorded from 1980 to 1998 to 3,9% during the targeting period. The mean absolute deviation during the targeting period was 2,1%. Although this rate is higher than the rate experienced by other inflation-targeting countries, it is still lower by the Poland's historical standard. Moreover, inflation volatility declined during the inflation-targeting period when compared with the pre-inflation-targeting period.

Table 5.9: The inflation rate in Poland

Years	Inflation rates	Years	Inflation rates	χ	$\chi - \overline{\chi}$	Target bands	Target miss	Beyond bands or percentages
1980	9,4	1999	7,3	7,3	3,4	8% - 8,5%	0,7	Ω
1981	21,2	2000	10,1	10,1	6,2	5,4% - 6,8%	3,3	Ω
1982	100,8	2001	5,5	5,5	1,6	5,4% - 6,8%	0,0	§
1983	22,1	2002	1,9	1,9	2,0	5,4% - 6,8%	3,5	Ω
1984	75,6	2003	0,8	0,8	3,1	0% - 4%	0,0	§
1985	15,1	2004	3,5	3,5	0,4	1,5% - 3,5%	0,0	§
1986	17,8	2005	2,1	2,1	1,8	1,5% - 3,5%	0,0	§
1987	25,2	2006	1,0	1,0	2,9	1,5% - 3,5%	0,5	Ω
1988	60,2	2007	2,5	2,5	1,4	1,5% - 3,5%	0,0	§
1989	251,1	2008	4,2	4,2	0,3	1,5% - 3,5%	0,7	Ω
1990	585,8	2009	3,5	3,5	0,4	1,5% - 3,5%	0,0	§
1991	70,3	Post-IT		$\overline{\chi}$	MAD		Average	5/11 or 45,5%
1992	43,0	average	3,9	= 3,9	= 2,1		= 0,8	
1993	35,3							
1994	32,2							
1995	27,9							
1996	19,9							
1997	14,9							
1998	11,8							
Pre-IT average	75,8							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.9.2 Target achievement

A faster than expected decline in the inflation rate prompted the NBP to reduce its target for 1999 early in the year (Rybinski 2006). Figure 5.9A reveals that, although the initial inflation-target achievement in Poland was poor, and characterised by large target misses, signs in recent years suggest that the country is improving its performance of achieving inflation targets. In its inflation targeting experience, the set targets were realised in six of 11 times (54,5%) and were missed in five of 11 times (45,5%). Moreover, the average deviation of the inflation rate from the set targets is 0,8%, a rate better than those experienced by other emerging-market economies such as the Czech Republic and Israel (see Table 5.25 in the Appendix B section).

As a result of this performance, Poland, along with Brazil, ranks 7th among the inflation-targeting countries (see Figure 5.25 in the Appendix A section).

Figure 5.9A: The inflation targets and actual rates in Poland

Years	1999	2000 - 2002	2003	2004 - 2010
Targets	8% - 8.5%	5.4% - 6.8%	<4%	2.5%

Inflation-targeting adoption date: 1999

Source: World Economic Outlook Database
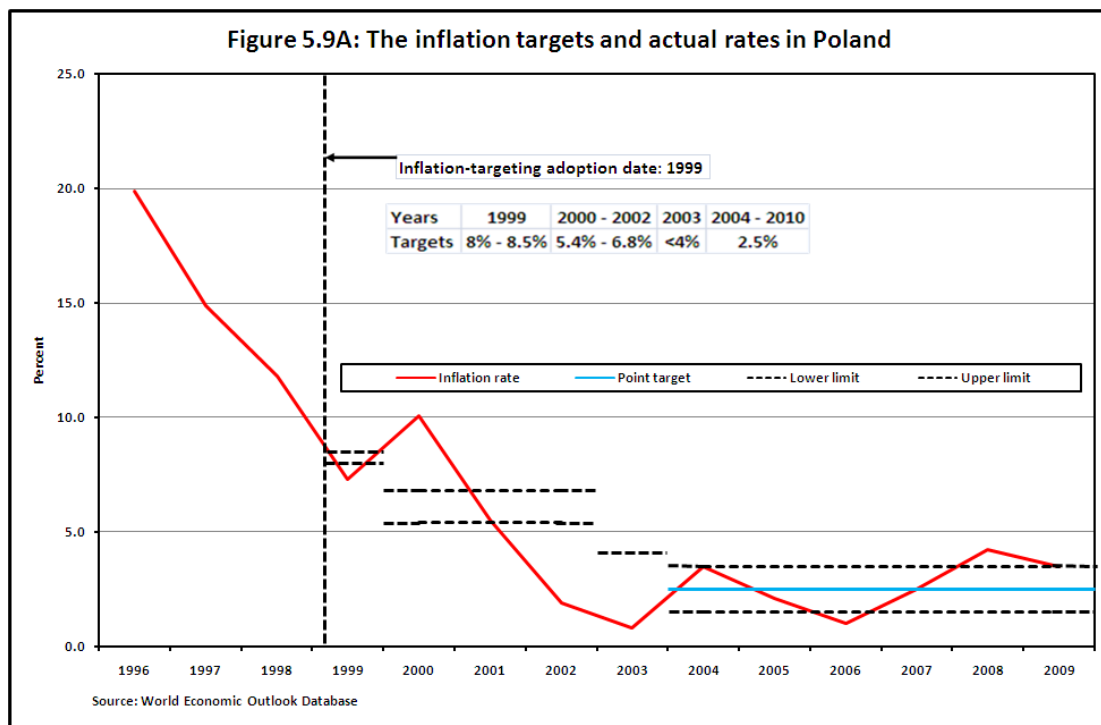
5.2.9.3 Economic growth, unemployment and interest rate

Figure 5.9B indicates that Poland's economic growth rate has changed significantly over time, surpassing the growth rates of other Central European economies after the adoption of an inflation-targeting framework. Average economic growth from 1980 to 1998 was 1,2%, increasing to 4,0% during the inflation-targeting period. This performance was possible despite a number of external shocks such as the oil price shock in 2007, and the tough global economic crisis experienced in 2008. Moreover, Figure 5.9B underlines that although the rate of unemployment increased after the adoption of the inflation-targeting framework, it began to decline afterwards, boosted by robust economic growth that was experienced during the inflation-targeting period. On average, however, the rate of unemployment was 1,2% higher than the average

rate of 12,7% recorded nine years prior to the inflation-targeting framework. Figure 5.9B further shows that the interest rate marginally increased after the adoption of the inflation-targeting framework before declining continuously since 2000 and reaching the lowest rate of 4,3% in 2006. Thus, average interest rate during the inflation-targeting period was low and stable by the historical standards of the country.

Figure 5.9B: The macroeconomic variables in Poland
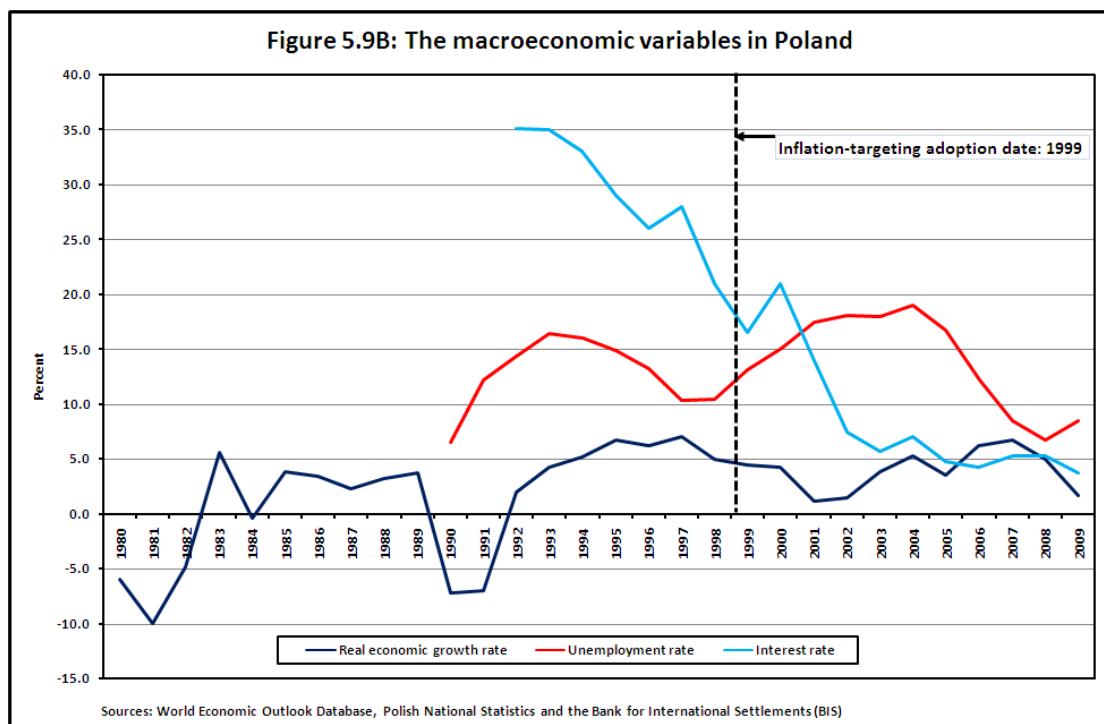
5.2.10 Brazil

Brazil followed a big bang strategy for the adoption of an inflation-targeting framework, that is, inflation targeting was implemented in a very short period, making Brazil the first Latin American country to implement a formal inflation-targeting framework. It took Brazil fewer than six months (March to June 1999) to introduce a full-fledged inflation-targeting framework after a brief period of exchange-rate targeting that ended in a major crisis in 1998 and as part of an extensive programme

of economic reforms (Schmidt-Hebbel & Werner 2002). Formal inflation targeting was adopted in June 1999 by Presidential Decree no. 3088 (Mishkin & Savastano 2001; Roger & Stone 2005).

5.2.10.1 *Lowering the inflation rate*

The inflation-targeting framework proved to be an important monetary-policy strategy in achieving a low inflation rate despite large economic and political shocks. Table 5.10 highlights that Brazil experienced a significant reduction in the average inflation rate of over 600,0% recorded almost two decades prior to the implementation of the inflation-targeting framework, to an average rate of closer to 6,0% during the inflation-targeting period, that is, a lower average inflation rate was achieved within a shorter period of time or within 11 years. This was a remarkable performance by the historical standard of the country. Even though the mean absolute deviation seems to be higher at 1,9% when compared with the rates of industrialised inflation-targeting countries, it is still in line with the rates experienced by other emerging-market countries (see Table 5.26 in the Appendices C section & Table 5.27 in the Appendix D section). Moreover, inflation volatility during the inflation-targeting period is not far off from inflation variability experienced by other emerging-market countries, and is better than before the inflation-targeting framework was introduced.

Table 5.10: The inflation rate in Brazil

Years	Inflation rates	Years	Inflation rates	x	$\lvert x - \bar{x} \rvert$	Target bands	Target miss	Beyond bands or percentages
1980	90,2	1999	4,9	4,9	1,8	6% - 10%	1,1	Ω
1981	101,7	2000	7,1	7,1	0,4	4% - 8%	0,0	§
1982	100,5	2001	6,8	6,8	0,1	2% - 6%	0,8	Ω
1983	135,0	2002	8,4	8,4	1,7	1,5% - 5,5%	2,9	Ω
1984	192,1	2003	14,8	14,8	8,1	8,5%	6,3	Ω
1985	226,0	2004	6,6	6,6	0,1	3% - 8%	0,0	§
1986	147,1	2005	6,9	6,9	0,2	2,5% - 6,5%	0,4	Ω
1987	228,3	2006	4,2	4,2	2,5	2,5% - 6,5%	0,0	§
1988	629,1	2007	3,6	3,6	3,1	2,5% - 6,5%	0,0	§
1989	1430,7	2008	5,7	5,7	1,0	2,5% - 6,5%	0,0	§
1990	2947,7	2009	4,9	4,9	1,8	2,5% - 6,5%	0,0	§
1991	477,4	Post-IT		$\bar{x}$	MAD		Average	
1992	1022,5	average	6,7	= 6,7	= 1,9		= 1,0	5/11 or 45,5%
1993	1927,4							
1994	2075,8							
1995	66,0							
1996	16,0							
1997	6,9							
1998	3,2							
Pre-IT average	622,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.10.2   Target achievement

Although Brazil managed to reduce the inflation rate significantly and quickly after the adoption of the inflation-targeting framework, poor performance in terms of target achievement was experienced during the inflation-targeting period. Figure 5.10A shows both target misses and success during the inflation-targeting period. It further suggests that the initial inflation-targeting experience of the country was characterised by three large target misses in 1999, 2002 and 2003. Nonetheless, there are signs in the later part of the inflation targeting experience of the country that suggest an improved target-achievement performance. Table 5.10 confirms this point and shows that inflation targets were missed in five of 11 times or by 45,5%, and

achieved in six of 11 times or by 54,5%. These results obtained in the face of extremely adverse scenarios in which inflation targets were not achieved are satisfactory, revealing that the inflation-targeting framework is an effective and flexible framework. These results put Brazil on par with Poland in terms of both target misses and achievements (see Figure 5.25 in the Appendix A section). Nevertheless, Brazil performed worse than both Poland on the average inflation deviation from the set targets of 1,0 versus 0,8%. These averages, however, are still in line with the average deviations recorded by other emerging-market countries (see Table 5.27 in the Appendix D section).

Figure 5.10A: The inflation targets and actual rates in Brazil

Source: World Economic Outlook Database
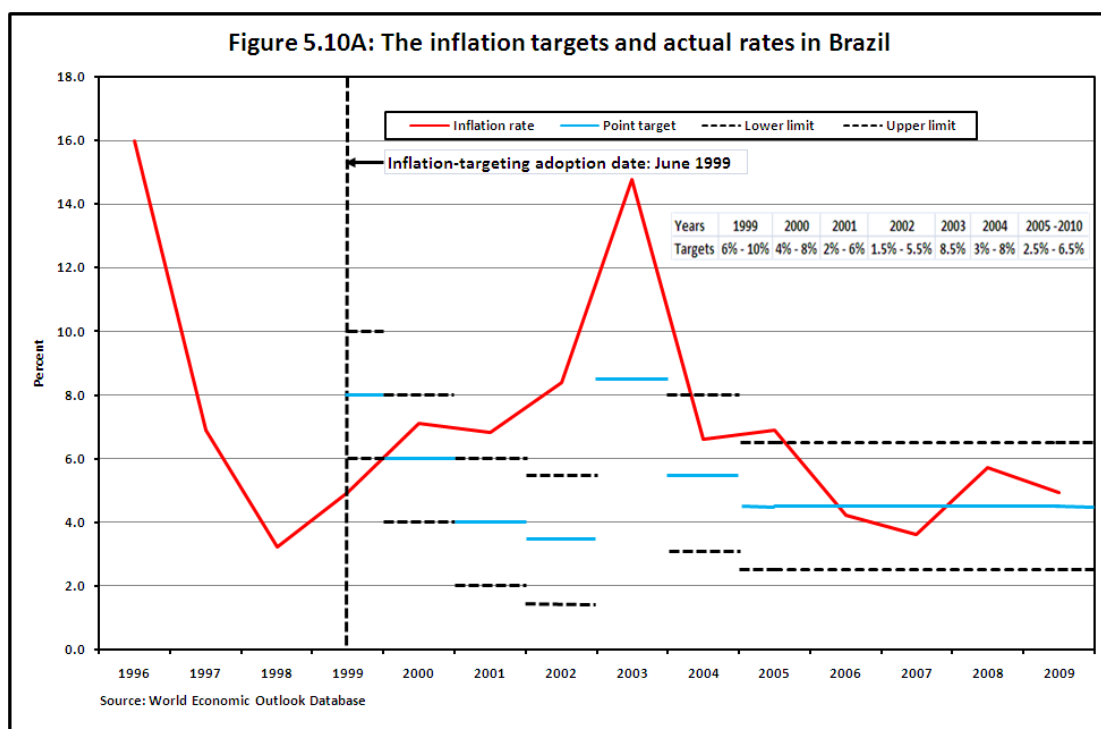
5.2.10.3 Economic growth, unemployment and interest rates

Although Brazil has adopted the inflation-targeting framework, its macroeconomic performance since the adoption of inflation targeting has been mixed. Regarding economic growth, Figure 5.10B brings to light that the economic growth rate under

the inflation-targeting framework improved, and remained positive and stable most of the time when compared to the previous exchange-rate targeting regime. In fact, average economic growth improved from 2,5% during 1980 to 1998 to 3,0 during the inflation-targeting period. Nevertheless, a higher economic growth trend failed to reduce the unemployment rate during the targeting period. Instead, the unemployment rate increased from an average of 5,0% to 8,5% during the targeting period. Nonetheless, recent developments, such as a declining rate of unemployment, seem to suggest that lower rates experienced before the adoption of the inflation-targeting framework are still possible to achieve. Moreover, Figure 5.10B attests that the inflation-targeting strategy inherited an economy with a very high interest rate that declined during the inflation-targeting period to an average rate of closer to 16,0%. Despite declining during the inflation-targeting period, this rate is still extremely higher by international standard and in relation to other emerging-market economies. Moreover, the variability of the Brazilian interest rate began to improve during the inflation-targeting period than the preceding period under other monetary-policy frameworks. Other authors who discus the inflation targeting experience in Brazil include, among others, Cerisola and Gelos (2005), and Minella *et al.* (2003).

Figure 5.10B: The macroeconomic variables in Brazil

Inflation-targeting adoption date: June 1999

Real economic growth rate — Unemployment rate — Interest rate

Sources: World Economic Outlook Database, Central Bank of Brazil and the Bank for International Settlements (BIS)
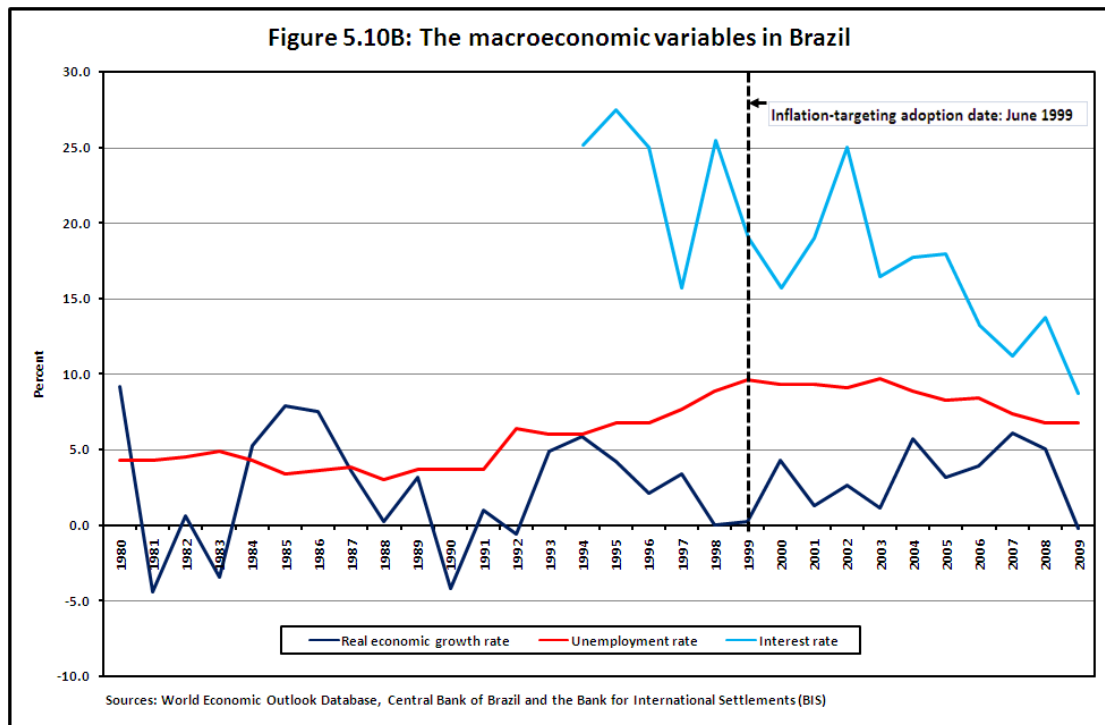
5.2.11 Chile

Inflation was a major issue for the government in Chile. Its reduction was a matter of debate and public concerns for decades. Inflation became an extremely serious concern when hyperinflation threatened the economy in the early and mid-1970s that later triggered a sharp shift in policies. Consequently, Chile adopted an informal inflation-targeting framework in 1991. As a result, Chile is among the pioneers of an informal inflation targeting, completing its transition to a full-fledged inflation-targeting framework in September 1999. Thus, Chile was an early but very gradual inflation-targeting adopter, taking close to ten years to complete its transition to a full-fledged inflation-targeting framework, thereby suggesting that inflation targeting can be used as a successful strategy for gradual disinflation (Schmidt-Hebbel & Werner 2002; Mishkin & Savastano 2001). However, the move to a full-fledged inflation-targeting framework was primarily driven by conflict between the exchange rate band commitment and annual inflation targets (Cespedes & Soto 2005).

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5.2.11.1   *Lowering the inflation rate*

The Chilean experience with inflation targeting portrayed in Table 5.11 suggests that the inflation-targeting framework was successful in attaining permanent low inflation rates even when the initial inflation rate was in double-digits. Perhaps these satisfactory results suggest that an inflation-targeting strategy is useful even in emerging-market countries by providing an effective nominal anchor for their economies. Table 5.11 exhibits that endemic inflation was defeated by the inflation-targeting strategy with the average inflation rate falling from 16,3% recorded from 1981 to 1998 to a rate closer to 3,0%, consistent with price stability, the medium-term target of the central bank, and when compared to inflation rates observed in industrialised countries. The mean absolute deviation is 1,2%, a rate closer to the rates recorded in other emerging-market economies (see Table 5.27 in the Appendix D section). Thus, inflation volatility is more favourable when compared to the pre-inflation-targeting period.

Table 5.11: The inflation rate in Chile

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1981	19,7	1999	3,3	3,3	0,2	4,3%	1,0	Ω
1982	9,9	2000	3,8	3,8	0,3	3,5%	0,3	Ω
1983	27,3	2001	3,6	3,6	0,1	2% - 4%	0,0	§
1984	19,9	2002	2,5	2,5	1,0	2% - 4%	0,0	§
1985	30,7	2003	2,8	2,8	0,7	2% - 4%	0,0	§
1986	19,5	2004	1,1	1,1	2,4	2% - 4%	0,9	Ω
1987	19,9	2005	3,1	3,1	0,4	2% - 4%	0,0	§
1988	14,7	2006	3,4	3,4	0,1	2% - 4%	0,0	§
1989	17,0	2007	4,4	4,4	0,9	2% - 4%	0,4	Ω
1990	26,0	2008	8,7	8,7	5,2	2% - 4%	4,7	Ω
1991	21,8	2009	1,5	1,5	2,0	2% - 4%	0,5	Ω
1992	15,4	Post-IT		$\overline{x}$	MAD		Average	
1993	12,7	average	3,5	= 3,5	= 1,2		= 0,7	6/11 or 54,5%
1994	11,4							
1995	8,2							
1996	7,4							
1997	6,1							
1998	5,1							
Pre-IT average	16,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.11.2 Target achievement

Table 5.11 and Figure 5.11A illustrate the inflation-targeting performance of Chile. They demonstrate that inflation targets were achieved in five of 11 times or by 45,5%, while targets were missed in six of 11 times or by 54,5%. According to Figure 5.25 in the Appendix A section, this performance ranks Chile as ninth and on par with other emerging-market economies such as Colombia. Nevertheless, Chile outpaced Colombia in terms of average inflation deviation from the set targets, recording 0,7% versus 0,9% (see Table 5.25 in the Appendix B section).

Figure 5.11A: The inflation targets and actual rates in Chile

Years	1999	2000	2001 - 2006	2007 - Onwards
Targets	4.3%	3.5%	2% - 4%	3%

Inflation-targeting adoption date: September 1999

Source: World Economic Outlook Database
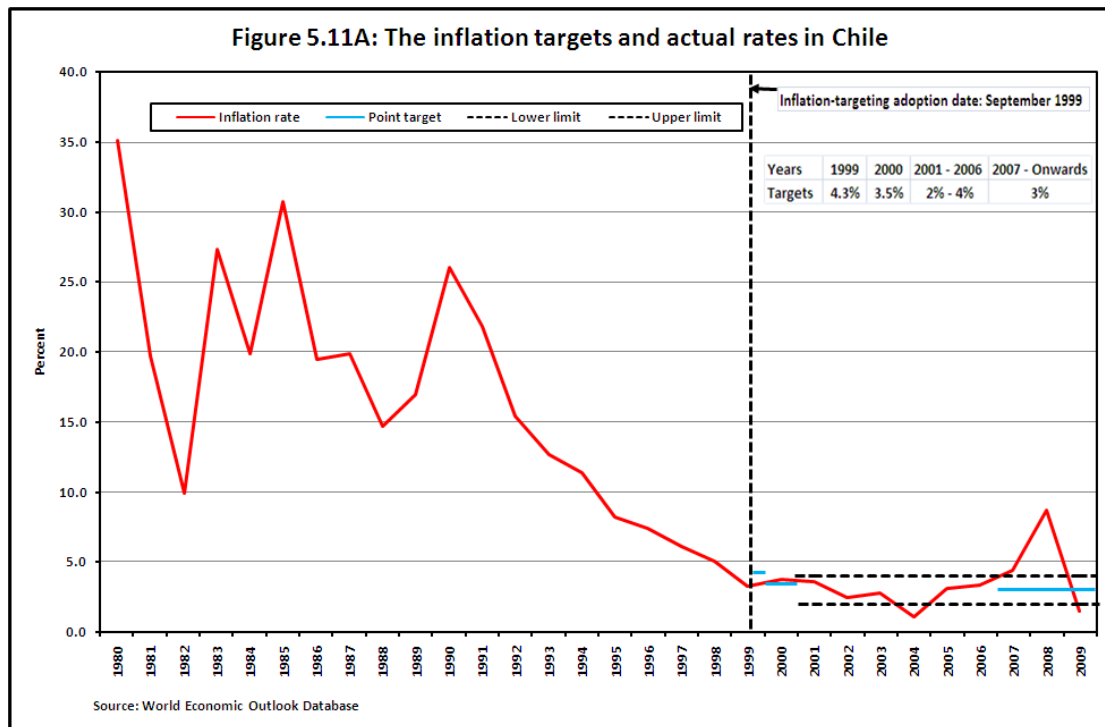
5.2.11.3   *Economic growth, unemployment and interest rates*

Figure 5.11B highlights that the reduction in inflation was correlated with satisfactory and stable economic growth rate during the inflation-targeting period. However, economic growth declined from an average rate of 5,3% documented 19 years prior to inflation targeting to 3,3% during the inflation-targeting period. Moreover, economic growth rate remained positive during most part of the inflation-targeting period. However, the average unemployment rate in Chile declined from 9,3% recorded between 1980 and 1998 to 8,6% during the targeting period. Another benefit of inflation targeting in Chile is that it has been successful in lowering and stabilising the interest rate to an average rate of 4,4%. The successful Chilean experience with the inflation-targeting framework is also cited by authors such as Brimmer (2002), Schmidt-Hebbel and Tapia (2002), and Hu (2006).

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Figure 5.11B: The macroeconomic variables in Chile

Inflation-targeting adoption date: September 1999

Sources: World Economic Outlook Database, Central Bank of Chile and Bloomberg

5.2.12 Colombia

Although Colombia implemented several elements of the inflation-targeting framework as early as 1991, a full-fledged inflation-targeting strategy was implemented in September 1999 after the abandonment of monetary targets and a crawling band for the exchange rate. Along with Chile, Colombia is among the first Latin American countries to implement an informal inflation-targeting framework, and experienced a similar transition period to a formal inflation-targeting framework that was closer to ten years (Calderon & Schmidt-Hebbel 2003).

5.2.12.1 Lowering the inflation rate

Although the actual inflation rate was on a steady downward path before the implementation of the inflation-targeting framework, the pace of disinflation accelerated after the adoption of the inflation-targeting framework, leading to more

than eight consecutive years of a single-digit inflation rate (see Table 5.12). The average inflation rate declined from 23,7% recorded 19 years prior to inflation targeting to 6,7% during the inflation-targeting period. This is a remarkable achievement, particularly for a country that had a persistent high inflation rate during the previous decade. Moreover, Colombia's mean absolute deviation is 1,6 that is lower than the rates experienced by, among others, Israel, Iceland, the Czech Republic, Poland, and Brazil (see Table 5.25 in the Appendix B section). Moreover, inflation volatility also declined during the inflation-targeting period when compared with the inflation volatility experienced almost two decades ago.

Table 5.12: The inflation rate in Colombia

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	25,9	1999	10,9	10,9	4,2	15%	4,1	Ω
1981	27,4	2000	9,2	9,2	2,5	10%	0,8	Ω
1982	24,5	2001	8,0	8,0	1,3	8%	0,0	§
1983	19,8	2002	6,3	6,3	0,4	6%	0,3	Ω
1984	16,1	2003	7,1	7,1	0,4	5% - 6%	1,1	Ω
1985	24,0	2004	5,9	5,9	0,8	5% - 6%	0,0	§
1986	18,9	2005	5,0	5,0	1,7	4,5% - 5,5%	0,0	§
1987	23,3	2006	4,3	4,3	2,4	4% - 5%	0,0	§
1988	28,1	2007	5,5	5,5	1,2	3,5% - 4,5%	1,0	Ω
1989	25,9	2008	7,0	7,0	0,3	3,5% - 4,5%	2,5	Ω
1990	29,1	2009	4,6	4,6	2,1	4,5% - 5,5%	0,0	§
1991	30,4	Post-IT		$\bar{x}$	MAD		Average	
1992	27,0	average	6,7	= 6,7	= 1,6		= 0,9	6/11 or 54,5%
1993	22,4							
1994	22,8							
1995	20,9							
1996	20,8							
1997	18,5							
1998	18,7							
Pre-IT average	23,7							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period
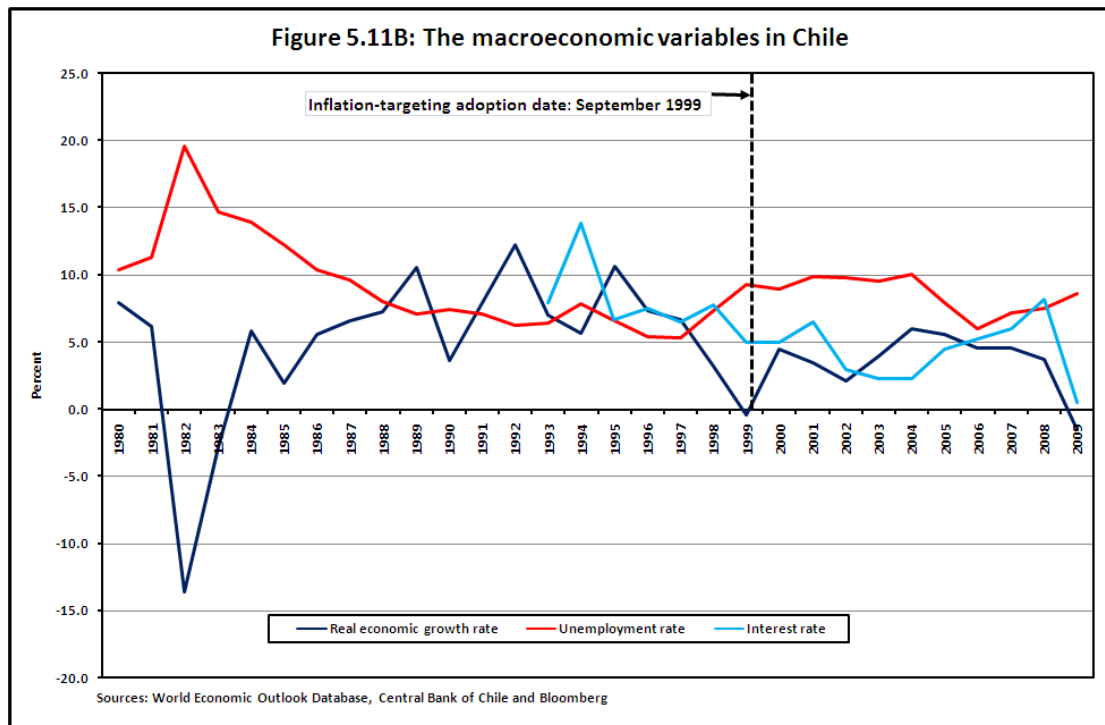
5.2.12.2   Target achievement

Figure 5.12A authenticates that Colombia had a poor initial record of achieving the set inflation targets. Nevertheless, recent experience suggests that such performance is becoming an issue of the past as the actual inflation rate is beginning to fluctuate around the target ranges. However, when comparing Colombia's actual inflation rate with the set targets, inflation targets were achieved in five of 11 years or by 45,5% while target misses occurred six of 11 years or by just over 50,0% of the inflation-targeting period. In four of six target misses, large target misses were recorded, leading to an average deviation of inflation of 0,9% from the set targets (see Table 5.12). However, this rate is still better than the average rates experienced in the Czech Republic (1,2%), Israel (1,0%), and Brazil (1,0%). According to the inflation-targeting performance ranking illustrated by Figure 5.25 in the Appendix A section, Colombia, along with Chile, ranks ninth.

Figure 5.12A: The inflation targets and actual rates in Colombia

Years	1999	2000	2001	2002	2003 - 2004	2005	2006	2007 - 2008	2009 - 2010
Targets	15%	10%	8%	6%	5% - 6%	4.5% - 5.5%	4% - 5%	3.5% - 4.5%	4.5% - 5.5%

Source: World Economic Outlook Database

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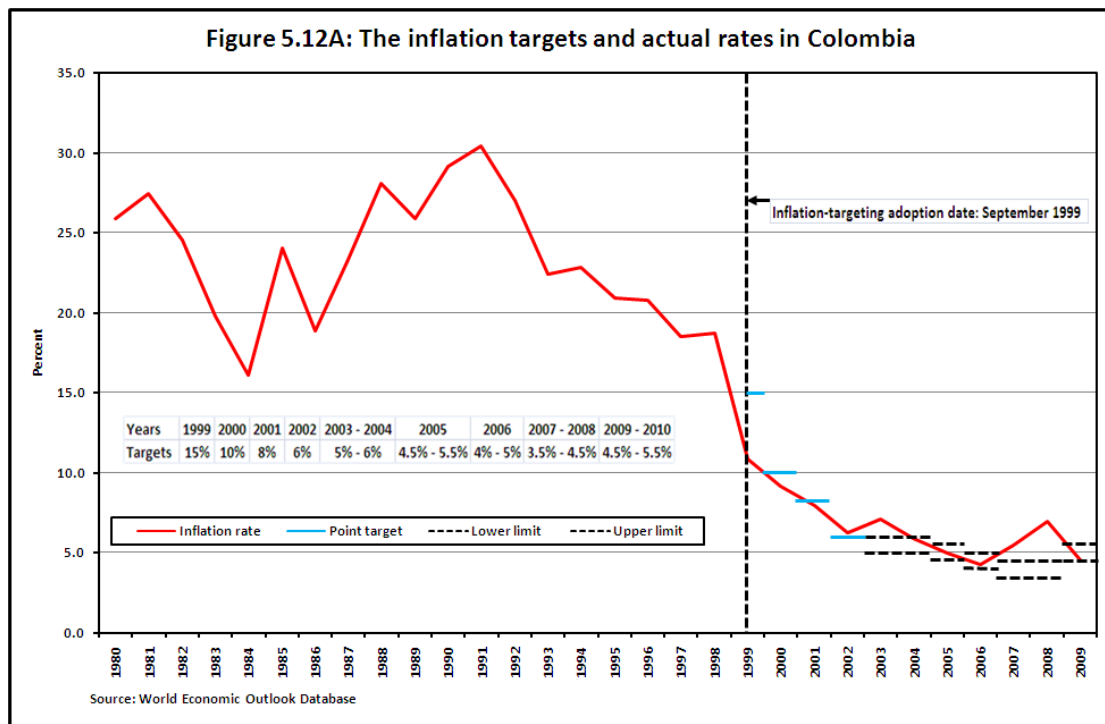
5.2.12.3   *Economic growth, unemployment and interest rates*

When comparing the overall performance of inflation targeting and the period of 19 years prior to the adoption of an inflation-targeting framework, the average economic growth rate of Colombia declined by 0,4%, the interest rate by more than 20,0%, while the rate of unemployment increased by 3,7% during the targeting period. Figure 5.12B indicates that economic growth recovered immediately after the adoption of the inflation-targeting framework, surpassing the market and the expectations of the Bank of Republic of Columbia.

Figure 5.12B: The macroeconomic variables in Colombia
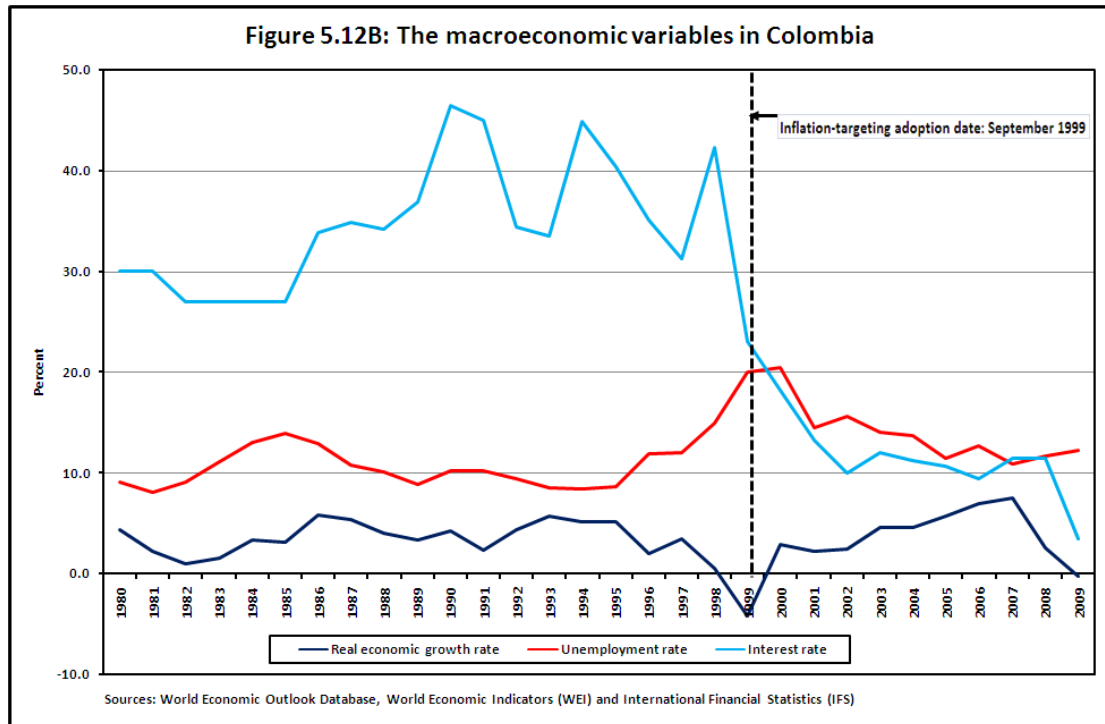
5.2.13 South Africa

The South African monetary authorities took a major step in February 2000 when they announced the adoption of inflation targeting as the monetary-policy framework of the country. As a result, South Africa became the 15th country to formally adopt

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this framework, and as a full-fledged inflation-targeting country. This policy was preceded by the adoption of an "informal inflation targeting" by the SARB from March 1998 (van den Heever 2001; Aron & Kingdon 2007). The CPIX, which was defined as the consumer price index (CPI) for metropolitan and other urban areas, excluding the interest cost on mortgage bonds, was chosen as the target measure for inflation-targeting purposes. The exclusion of only the interest-rate payments on mortgages was to ensure a wide coverage of consumer items, and at the same time to limit the effects of interest rates on inflation targets (du Plessis 2003; Aron & Muellbauer 2007). However, in the October 2008 Medium Term Budget Policy Statement (MTBPS), the Minister of Finance announced that the new headline CPI for all urban areas would become the new inflation-target measures from 2009, replacing the CPIX for metropolitan and other urban areas, but excluding mortgage-interest cost. The new headline CPI measure excludes owners' equivalent rent that is not negatively related to interest rates changes and was released for the first time in February 2009 (*South African Reserve Bank Quarterly Bulletin*, December 2008).

5.2.13.1 *Lowering the inflation rate*

Table 5.13 verifies that inflation declined from an average of 12,3% experienced two decades prior to the implementation of the inflation-targeting framework to 5,3% during the inflation-targeting period. A lower average inflation rate was achieved despite the negative effect of external factors such as higher commodity prices on the inflation rate in 2002 and during 2008 to 2009. Nevertheless, South Africa's experience with inflation variability is generally favourable, with the mean absolute deviation of inflation that declined during the inflation-targeting period. South Africa's mean absolute deviation of 2,3% is similar to the rate experienced in Israel. According to Table 5.25 in the Appendix B section, this rate is 0,4% or more higher than the rates experienced by other emerging-markets countries such as South

Korea (1,2%), Brazil (1,9%), Chile (1,2%), and Colombia (1,6%). Table 5.27 in the Appendix D section provides the mean absolute deviation rates for the other emerging-market economies. However, de Wet (2002) and du Plessis (2002) provide similar results of improved inflation performance in South Africa.

Table 5.13: The inflation rate in South Africa

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	13,8	2000	5,4	5,4	0,1	3% - 6%	0,0	§
1981	15,2	2001	5,7	5,7	0,4	3% - 6%	0,0	§
1982	14,7	2002	9,2	9,2	3,9	3% - 6%	3,2	Ω
1983	12,4	2003	5,6	5,6	0,3	3% - 6%	0,0	§
1984	11,5	2004	-0,9	-0,9	6,2	3% - 6%	3,9	Ω
1985	16,3	2005	2,1	2,1	3,2	3% - 6%	0,9	Ω
1986	18,6	2006	3,2	3,2	2,1	3% - 6%	0,0	§
1987	16,1	2007	6,1	6,1	0,8	3% - 6%	0,1	Ω
1988	12,9	2008	9,9	9,9	4,6	3% - 6%	3,9	Ω
1989	14,7	2009	7,1	7,1	1,8	3% - 6%	1,1	Ω
1990	14,4	Post-IT		$\bar{x}$	MAD		Average	
1991	15,3	average	5,3	= 5,3	= 2,3		= 1,3	6/10 or 60,0%
1992	13,9							
1993	9,7							
1994	9,0							
1995	8,7							
1996	7,4							
1997	8,6							
1998	6,9							
1999	5,2							
Pre-IT average	12,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.13.2   Target achievement

The existing inflation target band of 3,0% to 6,0% in South Africa is internationally among the highest. To a large extent this is justified, since in emerging-market

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economies like South Africa relatively rapid productivity growth in the tradable sector is generally transmitted through the economy through higher rates of inflation than in advanced countries. The current target range provides ample room for such effects. However, according to Table 5.13 and Figure 5.13A, South Africa experienced limited success in keeping inflation within the official target of 3,0% to 6,0%. Using both the old CPIX and new CPI target measures, the inflation-targeting period is characterised by target misses that were largely blamed on exogenous factors such as an exchange rate depreciation, and petrol, food and the prices of other commodities prices that experienced persistent, strong increases during the targeting period. The most recent trends of both the CPI and CPIX respectively confirm the target misses argument. In fact, inflation targets were missed in six of ten times or 60,0% of the time, while targets were achieved in four of ten times or 40,0% during the time of the inflation-targeting period. Large target misses were also recorded in four of six times, leading to a higher average of inflation deviation from the set targets of 1,3%. According to Table 5.27 in the Appendix D section, this average is slightly higher than the rates experienced by other emerging-market countries, among others, the Czech Republic (1,2%), Israel (1,0%) and Brazil (1,0%). According to the ranking of inflation-targeting performances as illustrated in Figure 5.25, South Africa, along with Indonesia, is tenth place when compared with the performance of other inflation-targeting countries (see Figure 5.25 in the Appendix A section).

Figure 5.13A: The inflation targets and actual rates in South Africa

Source: Statistics South Africa (Statssa)
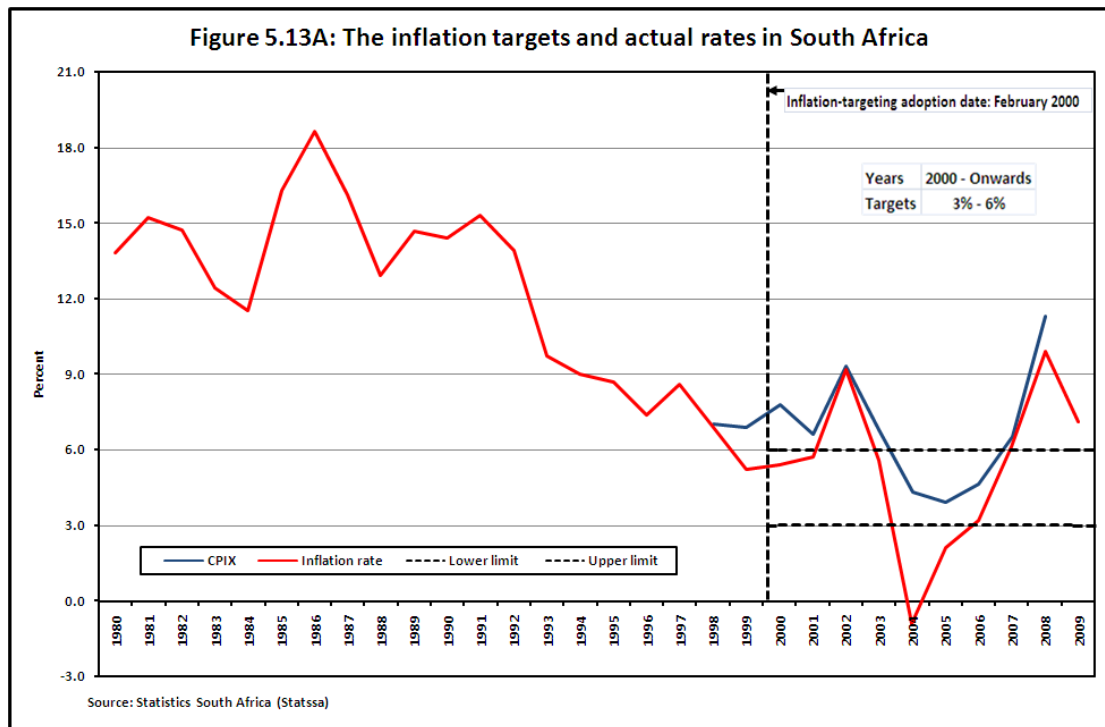
5.2.13.3   *Economic growth, unemployment and interest rates*

Figure 5.13B suggests that the South Africa recorded stronger economic growth performance which lasted longer in its history after the adoption of the inflation-targeting framework. Average economic growth increased from 1,8% between 1980 to 1999, to 3,6% during the inflation-targeting period. Moreover, the inflation-targeting policy encouraged a stable economic growth. Figure 5.13B further illustrates that, despite robust economic growth during the inflation-targeting period, the high unemployment rate characterises the South African economy and has become the most pressing concern or serious economic problem that faces policy-makers. From 1994 to 1999, the rate of unemployment averaged 21,0%, increasing to 25,9% during 2000 to 2009. This rate remains higher by international comparisons, perhaps suggesting that the unemployment rate in South Africa is unresponsive to both inflation and growth due to the structural inflexibility of its labour market. However, average interest rate declined from 14,4% recorded between 1980 to 1999 to 9,9% during the inflation-targeting period. Moreover, South Africa experienced greater

stability in interest rates given the less vigorous response to events during the inflation-targeting period when the standard deviation fell from 4,08% in the 1990s to 1,29% in the 2000s. Other authors who have highlighted the South African inflation-targeting performance include, among others, de Wet (2003); Woglom (2003); Dollery (2003); and du Plessis (2005a & 2005b).

Figure 5.13B: The macroeconomic variables in South Africa

Sources: South African Reserve Bank (SARB) and Statistics South Africa (Statssa)
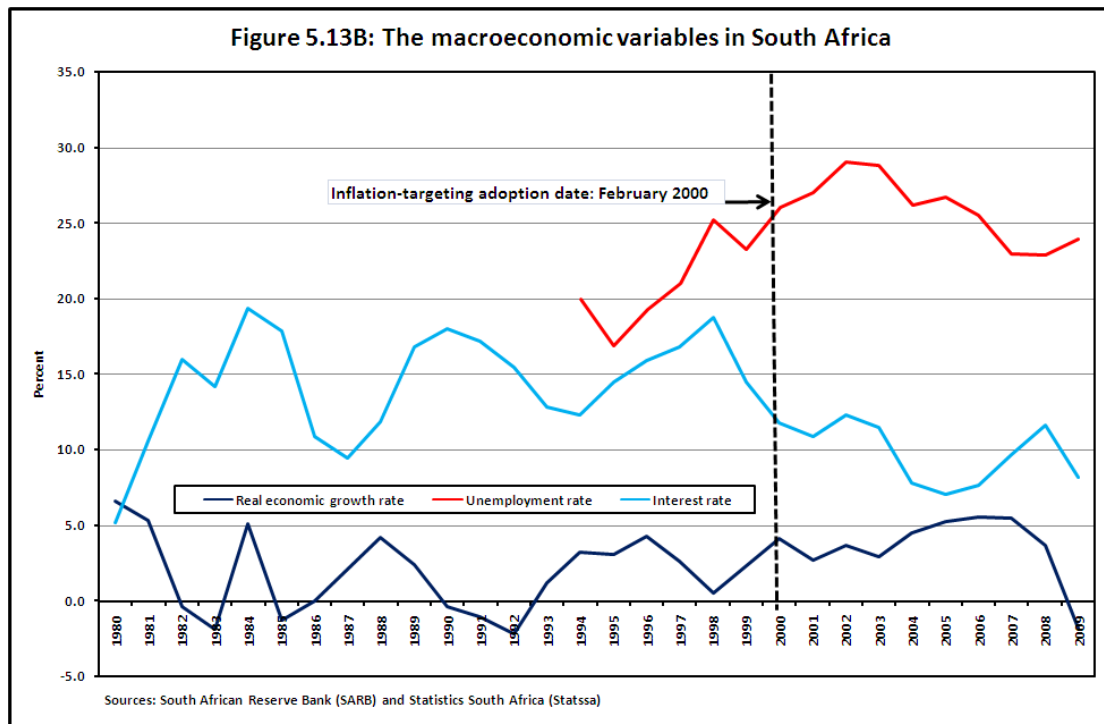
5.2.14 Thailand

The departure from the fixed exchange-rate regime forced the Bank of Thailand (BOT) to choose a new monetary-policy framework. After studies and experimental implementation of implicit inflation targeting, on 23 May 2000 the BOT formally adopted an inflation-targeting framework as its monetary-policy framework, making price stability the overriding policy objective (Jansen 2001). The adoption of the inflation-targeting framework followed the implicit inflation-targeting period which began in 1997.

5.2.14.1 *Lowering the inflation rate*

Table 5.14 shows that although inflation was already low when inflation targeting was adopted, the BOT has been successful in keeping it low at single-digit rates after explicit inflation targeting had been implemented. According to Table 5.14, the inflation rate averaged 5,4% between 1980 and 1999, declining to 1,1% during the inflation-targeting period. Inflation volatility declined during the inflation-targeting period as the central bank convinced the public that it would resist any persistent movements of inflation from the target band. The mean absolute deviation was 0,7%, a rate that compares favourably with the rates experienced by industrialised countries (see Figure 5.26 in the Appendix C section).

Table 5.14: The inflation rate in Thailand

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	19,7	2000	0,7	0,7	0,4	0% - 3,5%	0,0	§
1981	12,7	2001	1,3	1,3	0,2	0% - 3,5%	0,0	§
1982	5,3	2002	0,4	0,4	0,7	0% - 3,5%	0,0	§
1983	3,7	2003	0,2	0,2	0,9	0% - 3,5%	0,0	§
1984	0,9	2004	0,4	0,4	0,7	0% - 3,5%	0,0	§
1985	2,4	2005	1,5	1,5	0,4	0% - 3,5%	0,0	§
1986	2,9	2006	2,3	2,3	1,2	0% - 3,5%	0,0	§
1987	2,7	2007	1,1	1,1	0,0	0% - 3,5%	0,0	§
1988	3,1	2008	2,3	2,3	1,2	0% - 3,5%	0,0	§
1989	5,4	2009	0,3	0,3	0,8	0,5% - 3%	0,2	Ω
1990	6,1	Post-IT average	1,1	$\bar{x}$ = 1,1	MAD = 0,7		Average = 0,02	1/10 or 10,0%
1991	4,9							
1992	4,1							
1993	4,9							
1994	5,3							
1995	5,2							
1996	5,1							
1997	4,6							
1998	7,1							
1999	1,8							
Pre-IT average	5,4							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.14.2   Target achievement

Table 5.14 and Figure 5.14A illustrate that the BOT managed to keep inflation within the targets during most of the inflation-targeting period, making it the most successful inflation-targeting central bank since embracing the inflation-targeting framework. This was achieved despite the emerging-market status of the country, adverse external shocks such rising oil prices, and recurring exchange-rate shocks during the inflation-targeting period. In fact, inflation targets were achieved in nine of ten times or 90,0% of the inflation-targeting period. However, a target misses of 0,2% was

recorded in 2009, perhaps highlighting the negative effect of the current global economic crisis on actual inflation. Nonetheless, no large target miss was experienced in Thailand during the inflation-targeting period. As a result of its excellent performance, the average deviation of the inflation rate from the set targets is almost zero (see Table 4.14). Moreover, this performance has placed Thailand in the first place as being the best inflation-targeting performer among targeting countries (see Figure 5.25 in the Appendix A section).

Figure 5.14A: The inflation targets and actual rates in Thailand

Source: Bank of Thailand
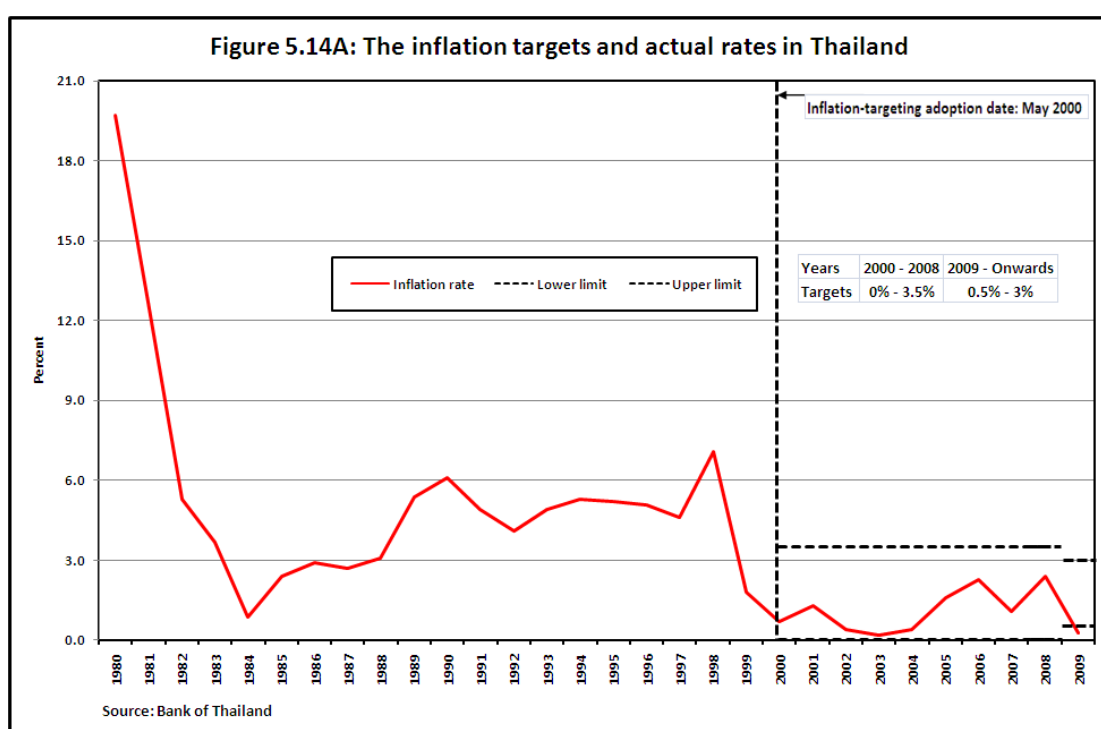
5.2.14.3   *Economic growth, unemployment and interest rates*

Even though average economic growth declined from 6,2% in 1980 to 1999 to 4,1% during the inflation-targeting period, such growth rates are still much better than the average rates experienced by other emerging-market economies during the same period. Figure 5.14B provides evidence to support this argument. Nevertheless, high economic growth rates were not achieved year-in and year-out. Furthermore, the

variability of economic growth decreased during the inflation-targeting period when compared to the pre-inflation-targeting period. Moreover, higher economic growth experienced in Thailand significantly improved the unemployment rate performance in the country. In fact, the average rate of unemployment declined from 2,4% as recorded between 1980 to 1999 to 1,6% during the inflation-targeting period. The unemployment rate remained close to this average in most part of the inflation-targeting period, thereby rendering Thailand's unemployment rate among the lowest in the world. Judgeing from the interest rate trend depicted in Figure 5.14B, Thailand's interest rate remained lower on average during the inflation-targeting period when compared with the preceding period under other monetary-policy frameworks. Moreover, interest-rate volatility also declined during the inflation-targeting period. Further evidence on macroeconomic performance of Thailand under the inflation-targeting framework can be found in, but not limited to, Levin *et al.* (2004).

Figure 5.14B: The macroeconomic variables in Thailand
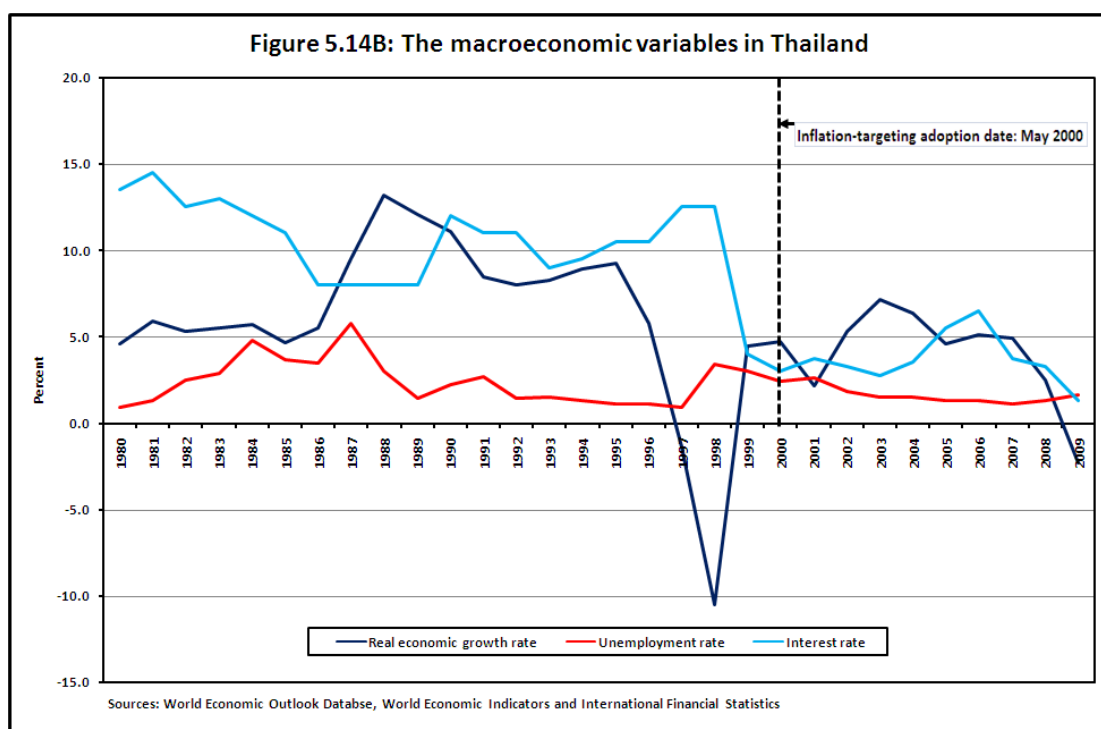
5.2.15 Mexico

Mexico started with a mixed regime of inflation and monetary targeting in January 1995 and implemented a full-fledged inflation-targeting framework in January 2001 (Hu 2006; Ramos-Francia & Garcia 2005). The decision to adopt inflation targeting was published in the *Monetary Policy Program for 2001* that also contains motivations behind the decision, and a brief exposition about the foundations, features and benefits of the regime (Sanchez 2005).

5.2.15.1   Lowering the inflation rate

Table 5.15 points out that inflation decreased considerably during the inflation-targeting period. Actually, the average inflation rate declined by 38,4% from a rate experienced more than two decades before the implementation of the inflation-targeting framework. Moreover, the inflation rate reached the lowest rate of 4,0% in 25 years by the end of 2005. The decline in inflation rate occurred without any apparent adjustment cost. Moreover, Mexico's inflation rate became more stable during the targeting period with the mean absolute deviation of 0,6%. Tables 5.25 and 5.26 in the Appendix B and C sections show that this rate compares favourably with the mean absolute deviations of other industrialised countries such as the UK and, in certain instances, exceeds the rates recorded by other industrialised countries such New Zealand (1,0%), Australia (1,0%) Sweden (0,8%), and Canada (0,7%). These achievements were in contrast to the economic past of the country and a good performance by historical standard characterised by high and volatile inflation.

Table 5.15: The inflation rate in Mexico

Years	Inflation rates	Years	Inflation rates	χ	$\chi - \overline{\chi}$	Target bands	Target miss	Beyond bands or percentages
1980	26,5	2001	6,4	6,4	1,7	6,5%	0,1	Ω
1981	27,9	2002	5,0	5,0	0,3	4,5%	0,5	Ω
1982	58,9	2003	4,5	4,5	0,2	2% - 4%	0,5	Ω
1983	101,9	2004	4,7	4,7	0,0	2% - 4%	0,7	Ω
1984	65,4	2005	4,0	4,0	0,7	2% - 4%	0,0	§
1985	57,7	2006	3,6	3,6	1,1	2% - 4%	0,0	§
1986	86,2	2007	4,0	4,0	0,7	2% - 4%	0,0	§
1987	131,8	2008	5,1	5,1	0,4	2% - 4%	1,1	Ω
1988	114,2	2009	5,3	5,3	0,6	2% - 4%	1,3	Ω
1989	20,0	Post-IT		$\overline{\chi}$	MAD		Average	
1990	26,7	average	4,7	= 4,7	= 0,6		= 0,5	6/9 or 66,7%
1991	22,7							
1992	15,5							
1993	9,8							
1994	7,0							
1995	35,0							
1996	34,4							
1997	20,6							
1998	15,9							
1999	16,6							
2000	9,5							
Pre-IT average	43,1							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.15.2   Target achievement

Despite the aforementioned achievements, Figure 5.15A shows that Mexico performed dismally in terms of meeting the set inflation targets. Actual inflation rate consistently surpassed the upper limit of the target range set by the central bank in most part of the inflation-targeting period. In actual fact, targets were achieved in three of nine times (33,3%), while inflation targets were missed in six of nine times or by 66,7% (see Table 5.15). Even though two large target misses were experienced during the inflation-targeting period, the average deviation of the inflation rate from

the set targets was lower at 0,5%. This rate compares favourably with the average rates experienced by industrialised countries (see Table 5.26 in the Appendix C section). Based on its performance, Mexico, along with Iceland, occupies the 12th place in the performance rankings of inflation-targeting countries as illustrated in Figure 5.25 in the Appendix A section.

Figure 5.15A: The inflation targets and actual rates in Mexico

Years	2001	2002	2003 - Onwards
Targets	6.5%	4.5%	3%

Inflation-targeting adoption date: January 2001

Source: World Economic Outlook Database
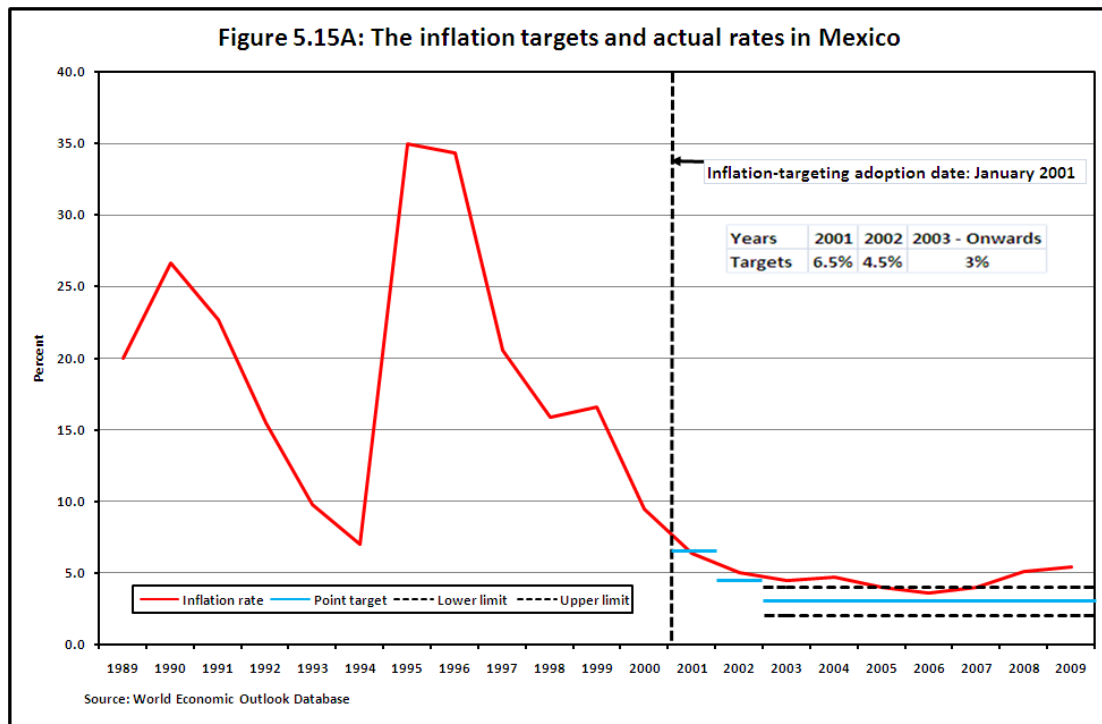
5.2.15.3 Economic growth, unemployment and interest rates

Even though Mexico adopted the inflation-targeting framework, economic growth and the unemployment rate did not respond positively. Figure 5.15B indicates that the average economic growth rate decreased by 1,7% from an average economic growth of 3,1% recorded two decades prior to the inflation-targeting framework, to 1,4% during the targeting period. Even though Mexico experienced an economic recession during 2008 and 2009, economic growth rates during the targeting period were more stable when compared to the rates of pre-inflation-targeting period. As a result of

poor economic growth during the targeting period, Mexico's unemployment rate increased marginally by 0,3% from an average of 3,4% recorded during 1985 to 2000, to 3,7% during the inflation-targeting period. Moreover, its volatility declined after the adoption of the inflation-targeting framework. Regarding the interest rate, Mexico's average interest rate remained low, declining from a double-digit rate of more than 20,0% prior to inflation targeting to historical levels of a single-digit rate of 7,4% during the inflation-targeting period. Moreover, a lower average interest rate remained stable during the inflation-targeting period. See Galindo and Ros (2008), and Capistran and Ramos-Francia (2010) for more information on Mexico's inflation targeting performance.

Figure 5.15B: The macroeconomic variables in Mexico

Sources: World Economic Outlook Database, Bank of Mexico and World Economic Indicators
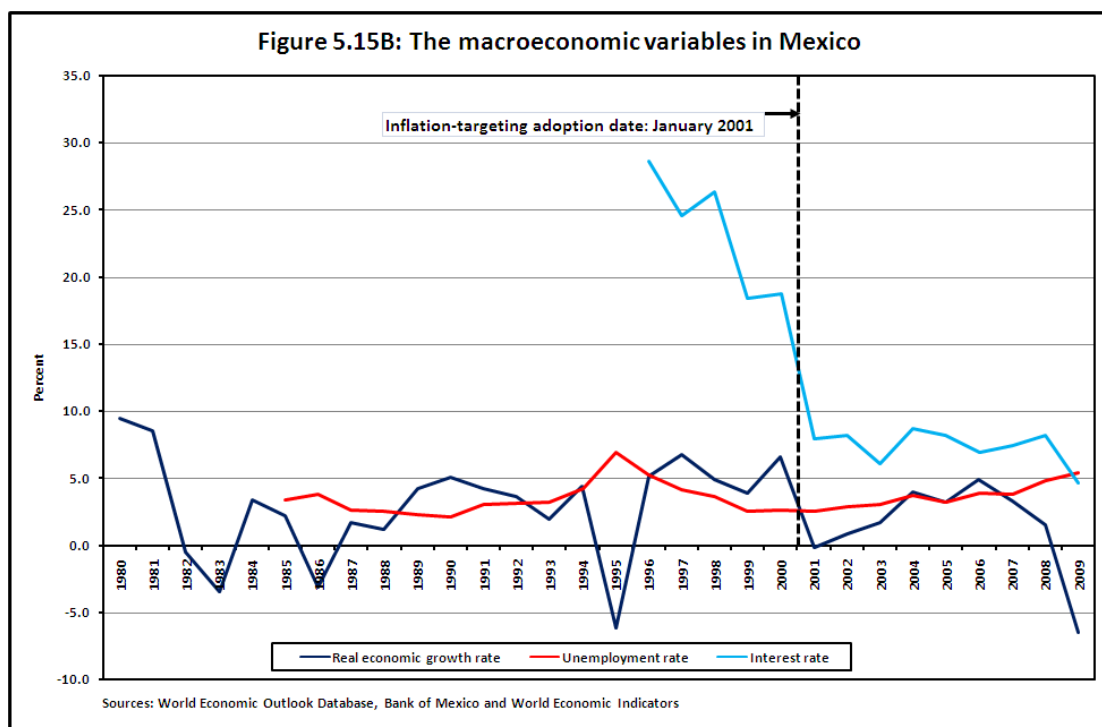
5.2.16 Iceland

On 27 March 2001, the government and the central bank of Iceland issued a joint declaration for adopting inflation targeting as the anchor of monetary policy, and

abandoning the fixed exchange-rate policy that had been followed for little more than a decade (Gunnarson 2003). Iceland moved to inflation targeting under fairly difficult conditions of depreciating currency, and its inflation rate was much higher than in the other Organisation for Economic Co-operation and Development (OECD) countries.

5.2.16.1 *Lowering the inflation rate*

Table 5.16 exhibits that the initial experience with inflation targeting in Iceland was largely positive. They managed to reduce the average inflation rate from an average of 20,9% experienced between 1980 to 2000 to 6,4% during the targeting period. A lower average inflation rate during the inflation-targeting period was still possible despite a spike in the actual inflation rate recorded in 2008 to 2009. Iceland's mean absolute deviation is 2,8% and on par with that of Indonesia. Tables 5.25 in the Appendix B section reveals that this rate is far higher than the rates recorded in other industrialised, inflation-targeting countries such as New Zealand (1,0%); Australia (1,0%); Sweden (0,8%); and Canada (0,7%); and comparable with or exceeding the rates recorded by other emerging-market economies such as Indonesia (2,8%); Israel (2,3%); South Africa (2,3%); Poland (2,1%); and the Czech Republic (2,0%). Although Iceland, along with Ghana and Indonesia, have the worst mean absolute deviation of inflation among inflation-targeting countries, inflation volatility decreased on average during the targeting period when compared to the preceding period (1980 to 2000) under other monetary-policy frameworks.

Table 5.16: The inflation rate in Iceland

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	58,5	2001	6,7	6,7	0,3	1% - 6%	0,7	Ω
1981	50,9	2002	4,8	4,8	1,6	1% - 4,5%	0,3	Ω
1982	51,0	2003	2,1	2,1	4,3	1% - 4%	0,0	§
1983	84,3	2004	3,2	3,2	3,2	1% - 4%	0,0	§
1984	29,2	2005	4,0	4,0	2,4	1% - 4%	0,0	§
1985	32,4	2006	6,7	6,7	0,3	1% - 4%	2,7	Ω
1986	21,3	2007	5,1	5,1	1,3	1% - 4%	1,1	Ω
1987	18,8	2008	12,7	12,7	6,3	1% - 4%	8,7	Ω
1988	25,5	2009	12,0	12,0	5,6	1% - 4%	8,0	Ω
1989	21,1	Post-IT		$\bar{x}$	MAD		Average	
1990	14,8	average	6,4	= 6,4	= 2,8		= 2,4	6/9 or 66,7%
1991	6,8							
1992	3,7							
1993	4,1							
1994	1,5							
1995	1,7							
1996	2,3							
1997	1,8							
1998	1,7							
1999	3,4							
2000	5,0							
Pre-IT average	20,9							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.16.2   *Target achievement*

In terms of target achievement, however, Table 5.16 and Figure 5.16A show that the actual inflation rate rarely remained within the target bands. Overshooting the target bands by large margins dominates the inflation-targeting experience of the country. Along with Mexico, inflation targets were missed in six of nine times, or by 66,7%, with limited success of achieving the set inflation targets in three of nine times, or by 33,3%. Moreover, four large target misses were recorded during the inflation-

targeting period. Moreover, two of four large target misses of 8,7% and 8,0% respectively recorded during 2008 to 2009 were the highest percentages in inflation-targeting countries. However, the average rate of inflation deviation from the set target is 2,4%, and is on par with the rates recorded in Indonesia. Nevertheless, this rate is among the highest in inflation-targeting countries, following upon 3,3% and 5,2% recorded in Turkey and Ghana respectively (see Tables 5.26 and 5.27 in the Appendix C and D section). The overall inflation-targeting performance of Iceland ranks it in 12th place, along with Hungary and Mexico (see Figure 5.25 in the Appendix A section).

Figure 5.16A: The inflation targets and actual rates in Iceland

Source: World Economic Outlook Database
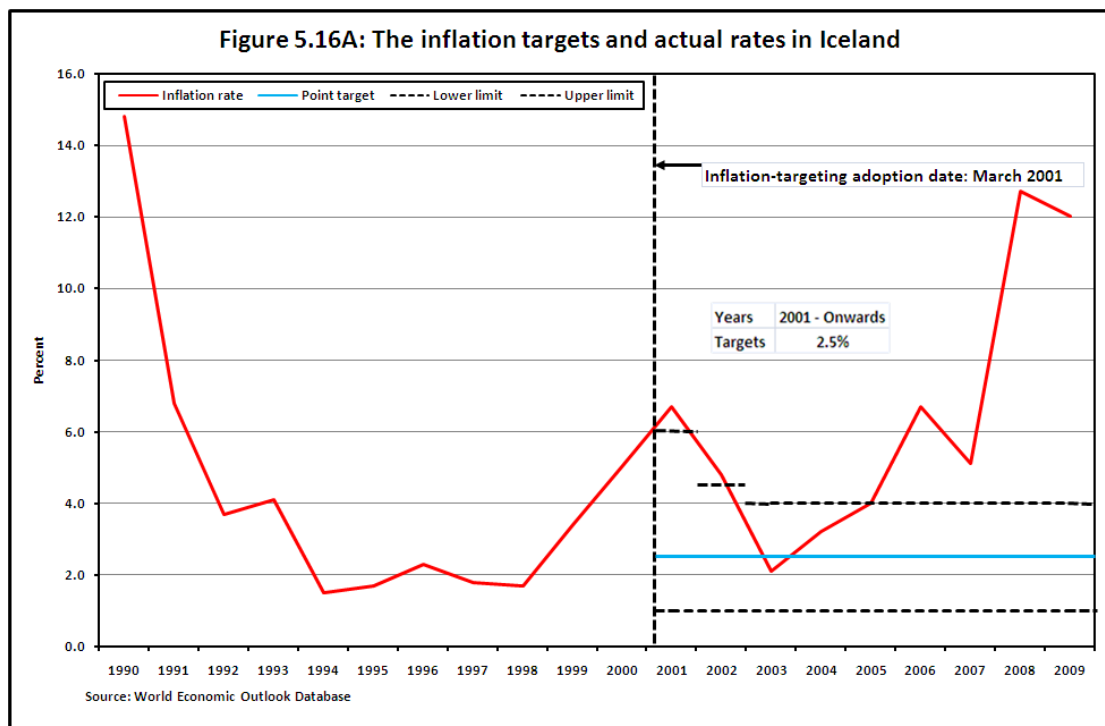
5.2.16.3   Economic growth, unemployment and interest rates

Even though the inflation-targeting performance in terms of target achievement in Iceland was poor, economic growth and the interest rate responded positively to the adoption of this framework. Moreover, Figure 5.16B illustrates that an overheating

economy and poor economic growth in 2002 interrupted the strong growth performance that started before the inflation-targeting framework was adopted. Nevertheless, Iceland's economic growth performance was much better afterwards, making it one of the faster growing economies among OECD countries. In fact, average economic growth increased to 3,0% during the inflation-targeting period. Furthermore, the volatility of economic growth during the inflation-targeting period fared much better than the pre-inflation-targeting period. The unemployment rate, however, increased marginally on average from 2,0% between 1980 to 2000, to 3,1% during the inflation-targeting period. This rate is rather better than the average rates experienced by other inflation-targeting countries. Moreover, volatility in the unemployment rate decreased during the inflation-targeting period. Figure 5.16B further indicates that Iceland adopted the inflation-targeting framework when the central bank was easing its monetary-policy stance, responding to the declining inflation rate and boosting economic growth during the same period. As a result, the average interest rate declined from 19,2% recorded in 1980 to 2000, to 12,5% during the inflation-targeting period. A lower average interest rate was still possible despite an interest-rate spike that the country experienced owing to larger target misses during greater part of the targeting period. Moreover, such lower interest rate remained stable during the inflation-targeting period (see Figure 5.16B).

Figure 5.16B: The macroeconomic variables in Iceland

Inflation-targeting adoption date: March 2001

Real economic growth rate — Unemployment rate — Interest rate

Sources: World Economic Outlook Database and International Financial Statistics (IFS)
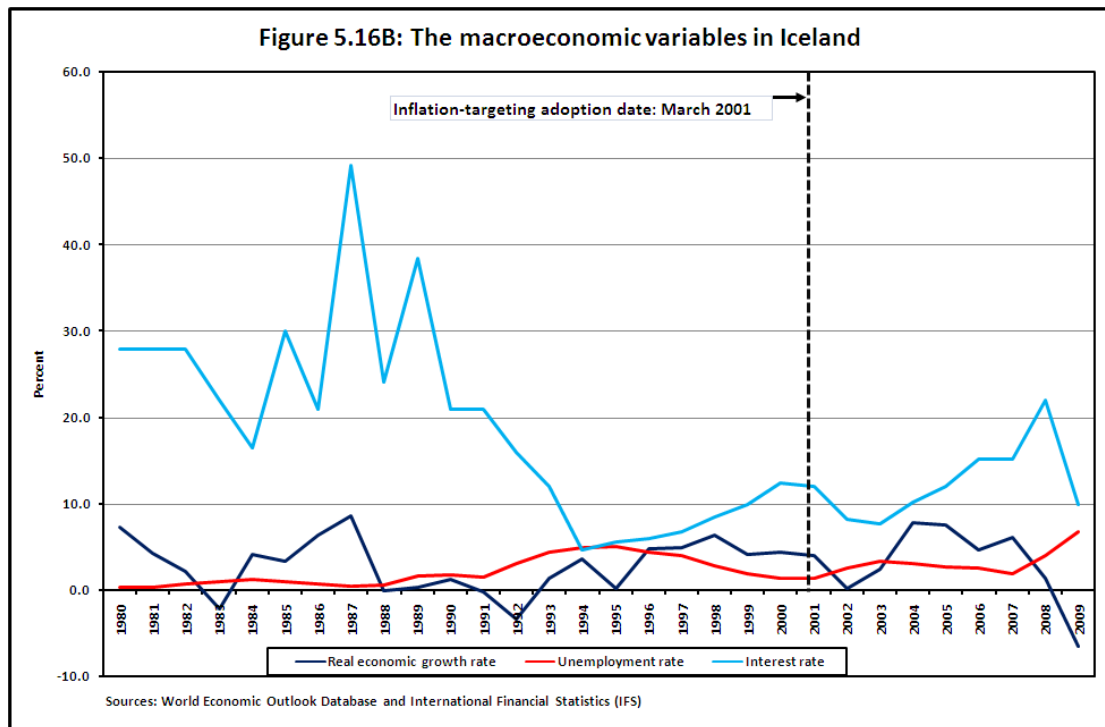
5.2.17 Norway

The Norges Bank had in practice applied implicit inflation targeting from 1999, but the institutional framework for monetary policy was formally laid down in the *Regulation on Monetary Policy* of 29 March 2001 with the explicit purpose to implement the inflation-targeting framework (Paulin 2006; Soikkeli 2002). The switch to inflation targeting was well prepared and smooth. The inflation-targeting framework is considered to be a suitable and appropriate monetary policy to achieve low and stable inflation objectives (Paulin 2006).

5.2.17.1 Lowering the inflation rate

The inflation-targeting framework was a successful strategy in Norway, reducing the inflation rate during the inflation-targeting period. Table 5.17 shows that the average inflation rate in Norway was reduced from 5,3% from 1998 to 2000, to 2,0% during

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the inflation-targeting period. This was a remarkable improvement by the historical standard of the country. Moreover, the inflation-targeting monetary policy managed to keep inflation low during the targeting period. Although inflation volatility increased after the adoption of the inflation-targeting framework, it consistently remained below the 2,5% target point during the greater part of the targeting period. Even though the mean absolute deviation of 0,9% is higher than the rates experienced by other emerging-market economies such as Mexico (0,6%) and Thailand (0,7%), it is in line with the rates recorded by other industrialised countries (see Table 5.25 in the Appendix B section).

Table 5.17: The inflation rate in Norway

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1980	10,9	2001	3,0	3,0	1,0	1,5% - 3,5%	0,0	§
1981	13,7	2002	1,3	1,3	0,7	1,5% - 3,5%	0,2	Ω
1982	11,3	2003	2,5	2,5	0,5	1,5% - 3,5%	0,0	§
1983	8,4	2004	0,5	0,5	1,5	1,5% - 3,5%	*1,0*	Ω
1984	6,3	2005	1,5	1,5	0,5	1,5% - 3,5%	0,0	§
1985	5,7	2006	2,3	2,3	0,3	1,5% - 3,5%	0,0	§
1986	7,2	2007	0,7	0,7	1,3	1,5% - 3,5%	0,8	Ω
1987	8,7	2008	3,8	3,8	1,8	1,5% - 3,5%	0,3	Ω
1988	6,7	2009	2,2	2,2	0,2	1,5% - 3,5%	0,0	§
1989	4,5	Post-IT		$\overline{x}$	MAD		Average	
1990	4,1	average	2,0	= 2,0	= 0,9		= 0,3	4/9 or 44,4%
1991	3,4							
1992	2,3							
1993	2,3							
1994	1,4							
1995	2,4							
1996	1,2							
1997	2,6							
1998	2,3							
1999	2,3							
2000	3,1							
Pre-IT average	5,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.17.2   *Target achievement*

Table 5.17 and Figure 5.17A indicate the performance of Norway in terms of target achievement. They further illustrate that inflation targets were achieved in five of nine times or by 55,6%, while target were missed in four of nine times (44,4%). Moreover, one large target miss was recorded in 2004, and undershooting the targets dominated the inflation-targeting period. The average deviation of inflation from the set targets was 0,3%, a rate comparable with the rates of other industrialised

countries (see Table 5.26 in the Appendix C section). Based on its inflation-targeting performance, Figure 5.25 in the Appendix A section illustrates that Norway ranks sixth among the inflation-targeting countries.

Figure 5.17A: The inflation targets and actual rates in Norway

Source: World Economic Outlook Database
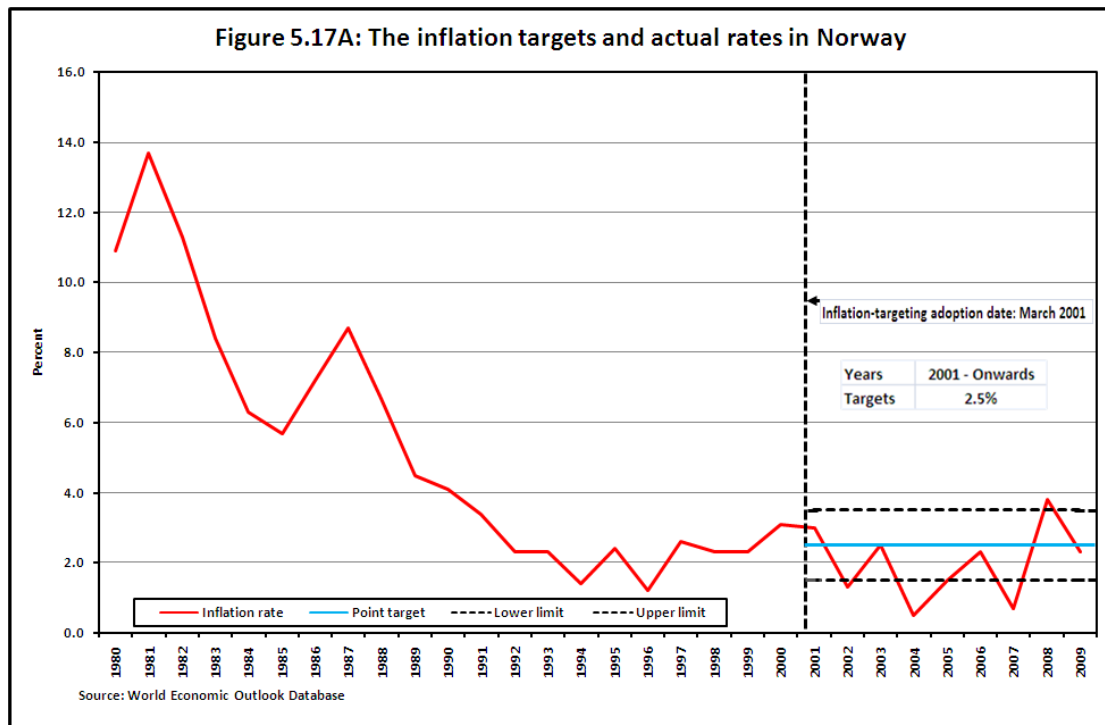
5.2.17.3 *Economic growth, unemployment and interest rates*

Figure 5.17B depicts Norway's economic growth, unemployment and interest-rate performances before and after the inflation-targeting framework was adopted. According to Figure 5.17B, the average economic growth rate declined marginally by 0,5% from a rate recorded from 1980 to 2000, of 3,2% to 2,7% during the inflation-targeting period. Although the economic growth declined during the inflation-targeting period, the unemployment rate slightly improved by 0,7% from an average of 3,8% prior to inflation targeting, to 3,1% during the inflation-targeting period. Figure 5.17B further shows that, despite a gradual increase during the early years of the inflation-targeting framework, the rate of unemployment decreased, recording an historical

low rate by the end of 2007. The interest rate, as depicted by Figure 5.17B, declined by 4,0% after the adoption of the inflation-targeting framework from an average of 9,7% documented between 1980 and 2000 to 5,7% during the inflation-targeting period.

Figure 5.17B: The macroeconomic variables in Norway

Inflation-targeting adoption date: March 2001

Sources: World Economic Outlook Database and Central Bank of Norway
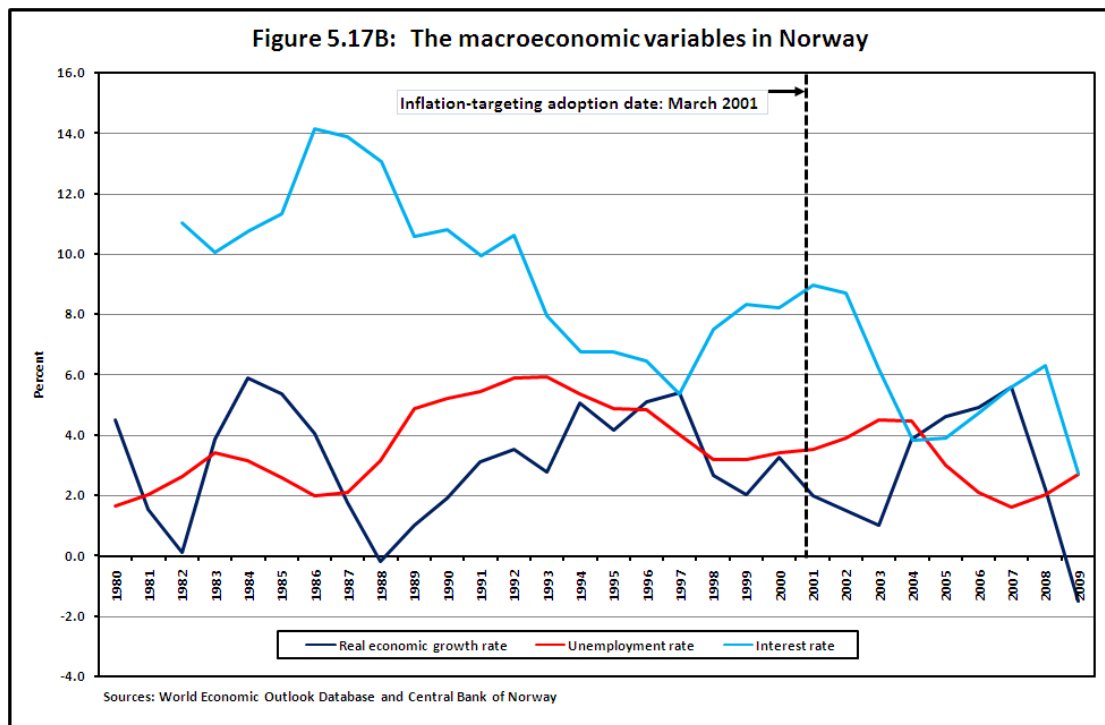
5.2.18 Hungary

Hungary followed an implicit inflation targeting in 1998 and adopted a full-fledged inflation-targeting framework in June 2001, becoming the third Central Eastern European country to adopt an inflation-targeting framework (Erdos 2008; Levin *et al.* 2004).

5.2.18.1 *Lowering the inflation rate*

Table 5.18 discloses that, following the introduction of the inflation-targeting framework, the average inflation rate decreased significantly from 15,3% documented in 1980 to 2000, to 5,7% during the inflation-targeting period, allowing the central bank and the government to set an inflation target for a longer period at a level corresponding to price stability. However, the lower inflation rate in Hungary lags behind the rates experienced in other Eastern European inflation-targeting countries such as the Czech Republic and Poland. However, Hungary experienced a substantial change for the better in inflation volatility during the inflation-targeting period, with a mean absolute deviation of 1,6%. Table 5.25 in the Appendix B section highlights that this rate is better than the mean absolute deviation of, among others, Ghana (3,0%), Indonesia (2,8%), Iceland (2,8%), and Israel (2,3%). Hungary, along with Mexico and Iceland, ranks 12th on the inflation-targeting performance as illustrated in Figure 5.25 in the Appendix A section.
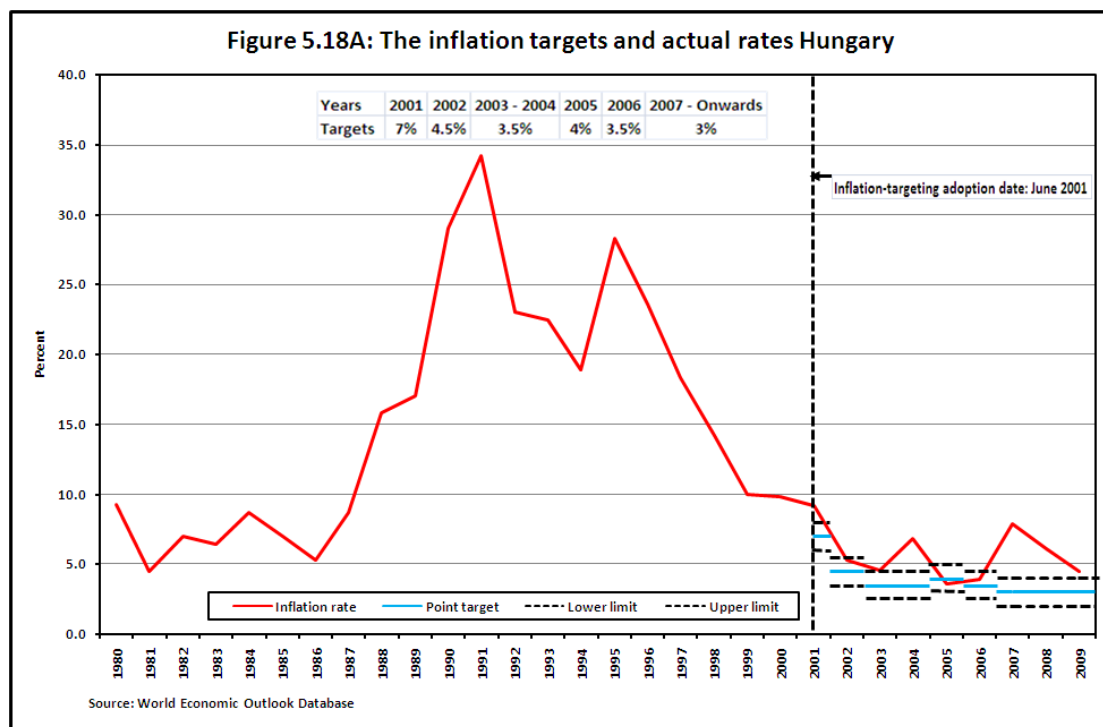
Table 5.18: The inflation rate in Hungary

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1980	9,3	2001	9,2	9,2	3,5	6% - 8%	1,2	Ω
1981	4,5	2002	5,3	5,3	0,4	3,5% - 5,5%	0,0	§
1982	7,0	2003	4,6	4,6	1,1	2,5% - 4,5%	0,1	Ω
1983	6,4	2004	6,8	6,8	1,1	2,5% - 4,5%	2,3	Ω
1984	8,7	2005	3,6	3,6	2,1	3% - 5%	0,0	§
1985	7,0	2006	3,9	3,9	1,8	2,5% - 4,5%	0,0	§
1986	5,3	2007	7,9	7,9	2,2	2% - 4%	3,9	Ω
1987	8,7	2008	6,1	6,1	0,4	2% - 4%	2,1	Ω
1988	15,8	2009	4,2	4,2	1,5	2% - 4%	0,2	Ω
1989	17,0	Post-IT		$\overline{x}$	MAD		Average	
1990	29,0	average	5,7	= 5,7	= 1,6		= 1,1	6/9 or 66,7%
1991	34,2							
1992	23,0							
1993	22,5							
1994	18,9							
1995	28,3							
1996	23,6							
1997	18,3							
1998	14,2							
1999	10,0							
2000	9,8							
Pre-IT average	15,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.18.2   Target achievement

Despite the lower inflation rate in Hungary, targets achievement remained elusive during the inflation-targeting period. Table 5.18 and Figure 5.18A show that, along with Mexico and Iceland, Hungary experienced target misses in six of nine times or 66,7%, with four of six target misses by large margins. Limited success of achieving the set targets is also portrayed in Table 5.18 and Figure 5.18A. They demonstrate that the inflation targets were met in three of nine times, or by 33,3%. When compared with Mexico's and Iceland's average inflation-rate deviation from the set

target was 0,6% and 1,3% better than that of the average of 1,1% of Hungary. Nonetheless, Table 5.27 in the Appendix D section shows that this average is still in line with the averages recorded by other emerging-market economies such as Chile (1,2%), and South Korea (1,2%).

Figure 5.18A: The inflation targets and actual rates Hungary

Years	2001	2002	2003 - 2004	2005	2006	2007 - Onwards
Targets	7%	4.5%	3.5%	4%	3.5%	3%

Inflation-targeting adoption date: June 2001

Source: World Economic Outlook Database

5.2.18.3   *Economic growth, unemployment and interest rates*

Evidence suggests that inflation targeting in Hungary was successful as the dynamics of economic variables and the behaviour of economic agents changed during the course of the past ten years. Figure 5.18B demonstrates that the Hungarian economy achieved stronger economic growth, and such economic expansion was better balanced during the greater part of the inflation-targeting period. In fact, the average economic growth improved from 1,1% in 1980 to 2000, to 2,2% during the inflation-targeting period. Moreover, the volatility of economic growth remained very low since the inflation-targeting framework was introduced and,

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despite numerous shocks that the economy experienced, the inflation targeting did not harm economic growth. Figure 5.18B also illustrates that the unemployment rate increased steadily after the adoption of the inflation-targeting framework, reaching rates that are still lower than the rates experienced before the inflation-targeting framework was implemented. In fact, the average unemployment rate decreased from 9,4% between 1992 to 2000, to 7,1% during the inflation-targeting period. Lower interest rates were also recorded during the targeting period. Figure 4.18B indicates that the average interest rate was lower during the inflation-targeting period when compared to the period under other monetary-policy regimes. The interest rate decreased from 17,8% from 1985 to 2000, to 8,7% during the targeting period. Moreover, interest-rate volatility also declined during the targeting period. Further information on the inflation-targeting performance in Hungary can be found in, but not limited to, the work of Rezessy (2006).

Figure 5.18B: The macroeconomic variables in Hungary

Sources: World Economic Outlook Database, *Magyar Nemzeti Bank* and Bloomberg
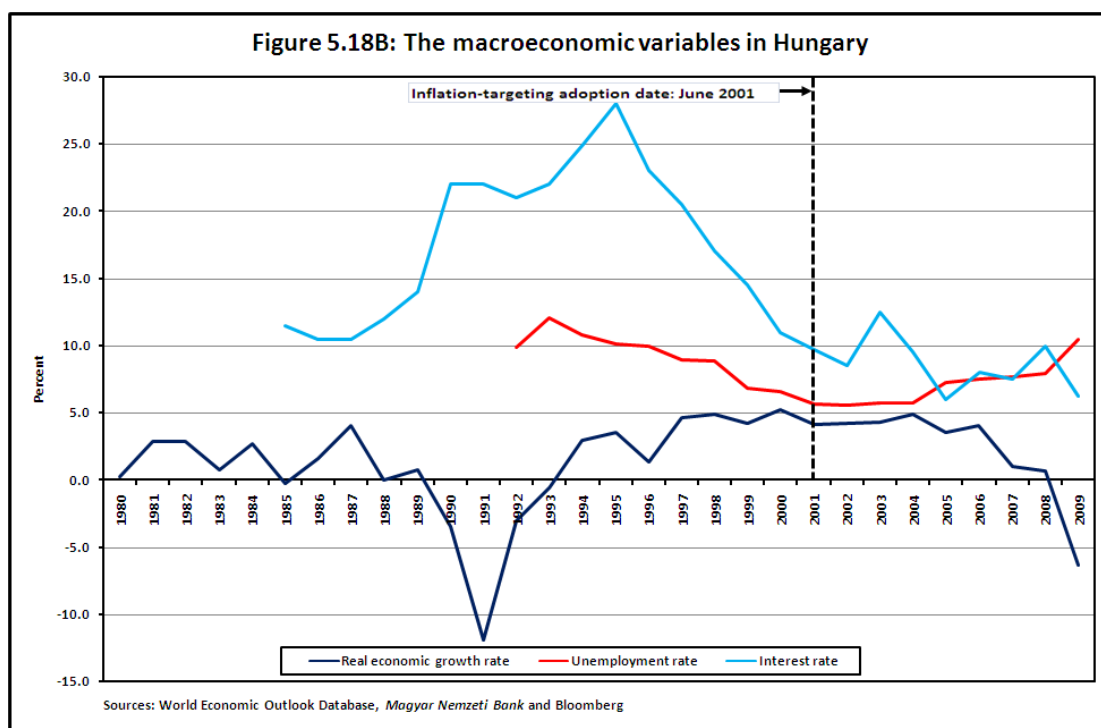
5.2.19 Peru

Peru announced an informal inflation-targeting system consistent with a money-growth operation target in 1994 (Mishkin & Savastano 2001). However, the monetary policy implemented by the Central Reserve Bank of Peru (BCRP) since January 2002 is based on an explicit inflation-targeting framework (Vega & Winkelried 2005). The move to implement a formal inflation-targeting framework consolidated achievements of the informal inflation-targeting framework.

5.2.19.1   Lowering the inflation rate

Table 5.19 shows that the problem of high inflation rate and inflation volatility became matters of the past after the inflation-targeting framework had been adopted. The average inflation rate decreased from more than 500,0% between 1980 to 2001 to 2,6%, which is consistent with price stability during the inflation-targeting period. This was a remarkable inflation performance by the historical standard of the country and other higher inflation emerging-market countries. Peru also managed to keep inflation low and stable during the inflation-targeting period with a mean absolute deviation of 0,6%. According to Table 5.26 in the Appendix C section, this rate is comparable with and, in certain cases, exceeds the rates recorded by other industrialised countries such as Iceland (2,8%), New Zealand (1,0%), Australia (1,0%), and Norway (0,9%).

Table 5.19: The inflation rate in Peru

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	59,1	2002	0,2	0,2	2,4	1,5% - 3,5%	1,3	Ω
1981	75,4	2003	2,3	2,3	0,3	1,5% - 3,5%	0,0	§
1982	64,5	2004	3,7	3,7	1,1	1,5% - 3,5%	0,2	Ω
1983	111,1	2005	1,6	1,6	1,0	1,5% - 3,5%	0,0	§
1984	110,2	2006	2,0	2,0	0,6	1,5% - 3,5%	0,0	§
1985	163,4	2007	1,8	1,8	0,8	1% - 3%	0,0	§
1986	77,9	2008	5,8	5,8	3,2	1% - 3%	2,8	Ω
1987	85,8	2009	3,2	3,2	0,6	1% - 3%	0,2	Ω
1988	667,0	Post-IT		$\bar{x}$	MAD		Average	
1989	3398,3	average	2,6	= 2,6	= 1,3		= 0,6	4/8 or 50,0%
1990	7481,7							
1991	409,5							
1992	73,5							
1993	48,4							
1994	23,4							
1995	11,1							
1996	11,4							
1997	8,6							
1998	7,2							
1999	3,5							
2000	3,9							
2001	2,0							
Pre-IT average	586,2							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.19.2   Target achievement

Table 5.19 and Figure 5.19 illustrate the inflation-target achievement performance of Peru. According to Table 5.19 and Figure 5.19A, the set inflation targets in Peru were achieved as well as missed. Recorded misses were four of eight times, or 50,0%, a similar performance to that of South Korea. However, two large target misses were recorded during the inflation-targeting period. As a result of these two large target
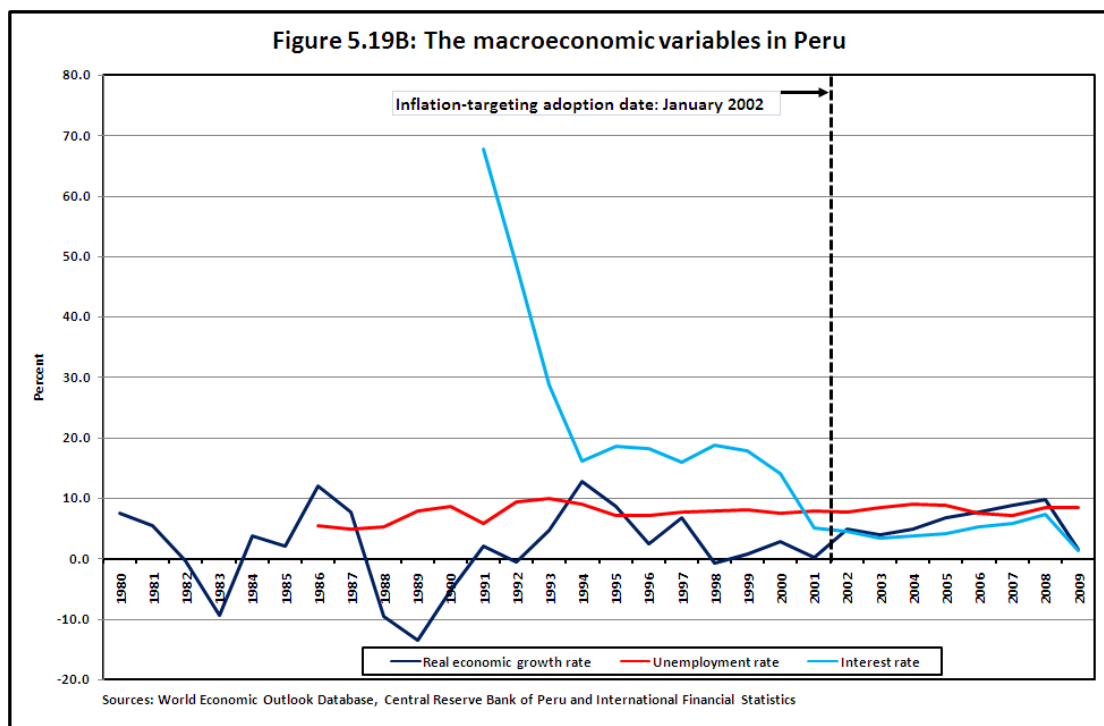
misses, the average deviation of the inflation rate from the set targets in Peru was 0,4% higher than the rate of 0,2% recorded in South Korea (see Table 5.25 in the Appendix B section). Figure 5.25 in the Appendix A section suggests that Peru performed better than expected and ranks eighth along with South Korea.

Figure 5.19A: The inflation targets and actual rates in Peru

Source: World Economic Outlook Database
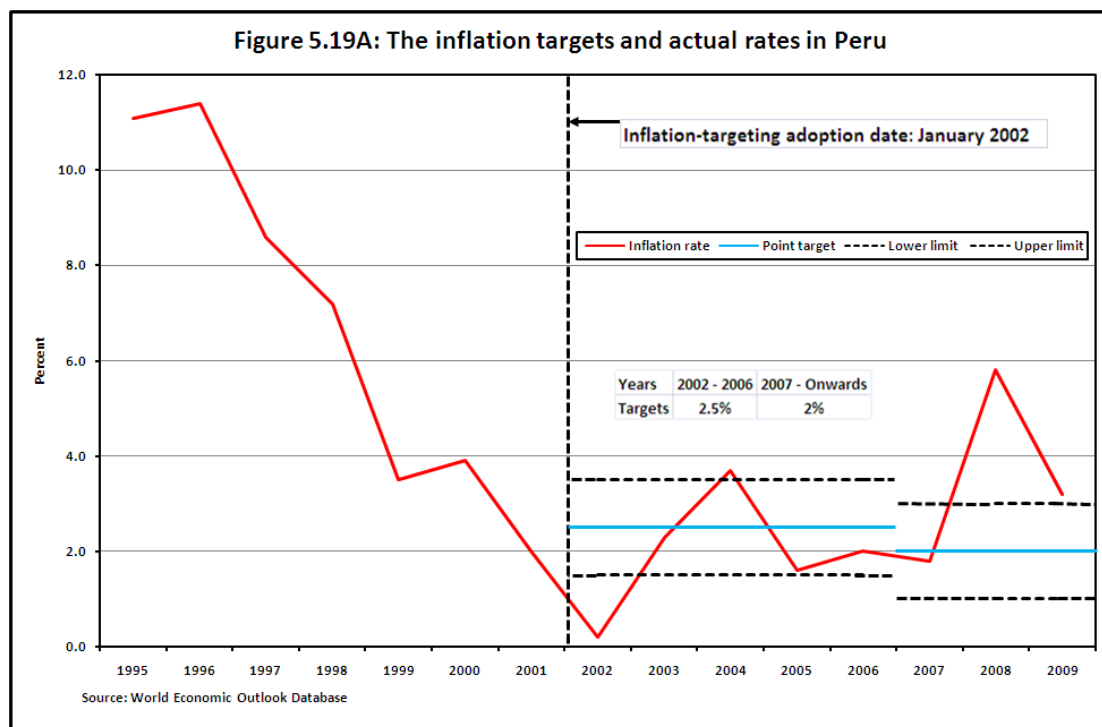
5.2.19.3 *Economic growth, unemployment and interest rates*

One of the most noticeable benefits of inflation targeting in Peru, as depicted in Figure 5.19B, is the faster pace of economic growth, due to the robust domestic demand and rising mineral exports that were recorded after the adoption of the inflation-targeting framework. In fact, the average economic growth increased from 1,9% between 1980 to 2001, to 6,1% during the inflation-targeting period. This achievement was possible despite the challenges posed by the global economic crisis, perhaps suggesting that the inflation-targeting framework made the Peruvian economy resilient to economic shocks. Moreover, economic growth volatility also

declined during the targeting period when compared to the pre-inflation-targeting period. Although the Peruvian economy recorded a robust economic growth during the inflation-targeting period, the rate of unemployment increased marginally by 0,7% from an average of 7,4% between 1986 and 2001, to 8,1% during the inflation-targeting period, suggesting that the role of other factors such as labour productivity and costs can influence the rate of unemployment. Figure 5.19B further indicates that the unemployment rate stabilised around the inflation-targeting period average, confirming that the inflation-targeting framework did not worsen the unemployment rate. Moreover, Figure 5.19B exhibits that the average interest rate declined to 4,4% during the inflation-targeting period, and remained significantly lower than the rate of more than 20,0% experienced 11 years before the inflation-targeting framework was implemented. Further information on the inflation-targeting performance in Peru can be found in, but not limited to, Castillo *et al.* (2006) and Walsh (2009).

Figure 5.19B: The macroeconomic variables in Peru

Sources: World Economic Outlook Database, Central Reserve Bank of Peru and International Financial Statistics

5.2.20 The Philippines

An implicit inflation targeting was adopted in 1995. During an implicit inflation-targeting period, time was devoted to make the necessary preparations for formal inflation targeting, including the operational details of the framework, inflation-forecasting models, and public education regarding the monetary-policy regime change. Moreover, the Philippines intensified its shift to the inflation-targeting framework since the Asian crisis (Kongsamut 2001). However, on 24 January 2000, the policy-making body of the bank, the Monetary Board, approved in principle the shift to inflation targeting as a framework for conducting monetary policy and, as a result, the *Bangko Sentral ng Philipinas* (BSP) formally adopted explicit inflation targeting as a framework for monetary policy in January 2002 (Vega & Winkelried 2005; Levin *et al.* 2004).

5.2.20.1   Lowering the inflation rate

The inflation-targeting framework served the Philippines well with an average inflation rate declining to lower levels during the inflation-targeting period. Table 5.20 shows that the average inflation rate decreased from 11,3% experienced two decades prior to inflation targeting to 5,3% after the implementation of an inflation-targeting framework. Moreover, the exceptional performance of a lowered average inflation rate was achieved within a short period of time, that is, within eight years of inflation targeting. Along with Poland, the mean absolute deviation of inflation is 2,1%, a rate in line with those recorded by other emerging-market economies (see Table 5.27 in the Appendix D section). Even though inflation volatility increased during the inflation-targeting period, it is still lower by the historical standard of the country.
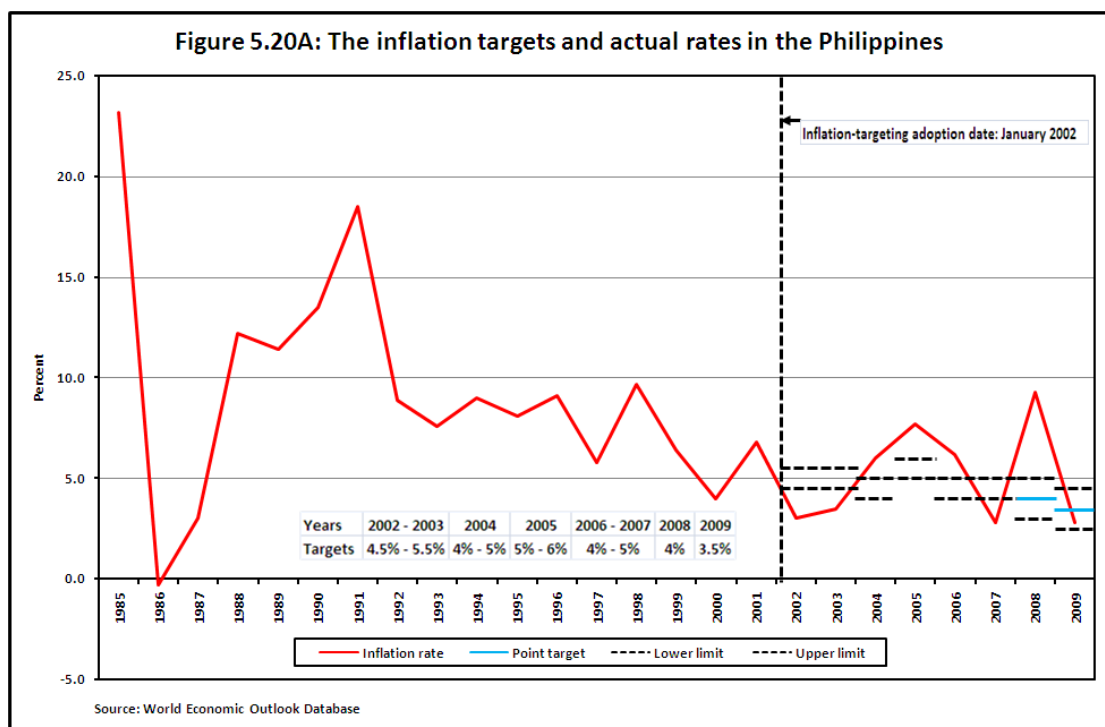
Table 5.20: The inflation rate in the Philippines

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1980	18,2	2002	3,0	3,0	2,2	4,5% - 5,5%	1,5	Ω
1981	13,1	2003	3,5	3,5	1,7	4,5% - 5,5%	1,0	Ω
1982	9,0	2004	6,0	6,0	0,8	4% - 5%	1,0	Ω
1983	5,3	2005	7,6	7,6	2,4	5% - 6%	1,6	Ω
1984	46,2	2006	6,3	6,3	1,1	4% - 5%	1,3	Ω
1985	23,2	2007	2,8	2,8	2,4	4% - 5%	1,2	Ω
1986	-0,3	2008	9,3	9,3	4,1	3% - 5%	4,3	Ω
1987	3,0	2009	3,3	3,3	1,9	2,5% - 3,5%	0,0	§
1988	12,2	Post-IT		$\overline{x}$	MAD		Average	
1989	11,4	average	5,2	= 5,2	= 2,1		= 1,5	7/8 or 87,5%
1990	13,5							
1991	18,5							
1992	8,9							
1993	7,6							
1994	9,0							
1995	8,1							
1996	9,1							
1997	5,8							
1998	9,7							
1999	6,4							
2000	4,0							
2001	6,8							
Pre-IT average	11,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.20.2   Target achievement

Figure 5.20 displays that the Philippines are among the inflation-targeting countries with the most dismal or worst performances in terms of target achievements. Inflation targets were achieved in one of eight times, or by 12,5%. Since the adoption of the inflation-targeting framework, the set inflation targets were not achieved in seven of eight years, or 87,5%, with the actual inflation rate either above or below the target ranges by larger margins, thereby forcing the central bank to write an open letter to
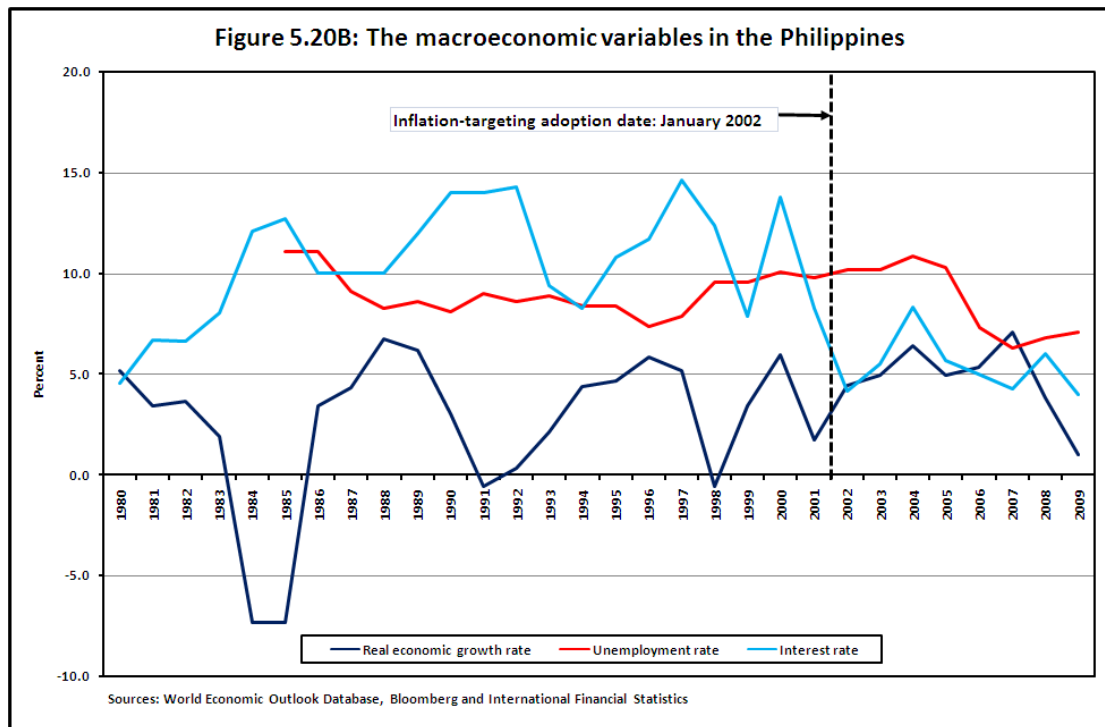
the president of the country to explain the reasons for the target misses, and to present its intentions to resolve the problem. In fact, the Philippines is the worst performer in this regard, with the highest number of seven target misses that are in the range of large target misses. As a result of seven large target misses recorded during the inflation-targeting period, the average deviation of inflation from the set targets is 1,5%. Even though this rate is higher than the rates recorded in other inflation-targeting countries, Table 5.25 in the Appendix B section demonstrate that it is still better than the averages recorded by Ghana (5,2%), Turkey (3,3%), and Indonesia (2,4%). Figure 5.25 in the Appendix A section shows the Philippines in 16th position on the inflation-targeting performance rankings.

Figure 5.20A: The inflation targets and actual rates in the Philippines

Years	2002 - 2003	2004	2005	2006 - 2007	2008	2009
Targets	4.5% - 5.5%	4% - 5%	5% - 6%	4% - 5%	4%	3.5%

Source: World Economic Outlook Database

5.2.20.3 Economic growth, unemployment and interest rates

Even though the Philippines have a dismal performance of target achievements, Figure 5.20B shows that its growth performance improved significantly after the

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adoption of the inflation-targeting framework, with an average that almost doubles the growth rate documented in the past 22 years. Actually, the average economic growth rate increased from 2,5% experienced between 1980 to 2001, to 4,7% during the inflation-targeting period, despite a number of high pressures situations such as the volatile oil prices, political uncertainties in 2005, and the current global economic crisis that weighs down the economy. Moreover, the volatility of economic growth declined rapidly after the introduction of the inflation-targeting framework, while the buoyant economic growth rate experienced during the inflation-targeting period marginally reduced the average unemployment rate by 0,5% during the targeting period. The average unemployment rate declined from 9,1% recorded from 1985 to 2001, to 8,6% during the inflation-targeting period. Figure 5.20B further indicates that the inflation-targeting period was characterised by a lower interest rate when compared with the pre-inflation-targeting period where double-digit rates were the norm. In fact, the average interest rate was almost halved, declining from 10,6% documented in 1980 to 2001, to 5,4% during the inflation-targeting period. The lower interest rate during the inflation-targeting period considerably narrowed the interest rate differential between the Philippines and its major trading partners. Moreover, unlike the period under other monetary-policy frameworks, the lower interest-rate volatility became the norm under the inflation-targeting framework.

Figure 5.20B: The macroeconomic variables in the Philippines

Inflation-targeting adoption date: January 2002

Sources: World Economic Outlook Database, Bloomberg and International Financial Statistics

5.2.21 Indonesia

Since 1999, the Bank of Indonesia (BoI) has been an inflation-targeting lite country, introducing an inflation-targeting approach as a new monetary-policy framework in July 2005. Since its introduction in 2005, the inflation-targeting framework has been a success (Sarwono 2007).

5.2.21.1 Lowering the inflation rate

Table 5.21 shows that, although Indonesia adopted the inflation-targeting framework when the actual inflation rate was increasing, it decreased after the inflation-targeting framework had been implemented, recording the lowest rate of closer to 5,0% in 2009. The average inflation declined from a double-digit rate of 11,2% documented between 1980 to 2004 to a single-digit rate of 8,7% during the inflation-targeting period. Along with Iceland, the mean absolute deviation in Indonesia is 2,8%, a rate

higher than rates recorded in other inflation-targeting countries (see Table 5.25 in the Appendix B section). Nevertheless, this rate is aligned to the rates recorded by other emerging-market countries (see Table 5.27 in the Appendix D section). Even though inflation volatility during the inflation-targeting period is higher than in other inflation-targeting countries, it is lower when compared to the historical standard of the country.

Table 5.21: The inflation rate in Indonesia

Years	Inflation rates	Years	Inflation rates	x	$x - \overline{x}$	Target bands	Target miss	Beyond bands or percentages
1980	18,0	2005	10,5	10,5	1,8	5% - 6%	4,5	Ω
1981	12,2	2006	13,1	13,1	4,4	7% - 9%	4,1	Ω
1982	9,5	2007	5,8	5,8	2,9	5% - 7%	0,0	§
1983	11,8	2008	9,5	9,5	0,8	4% - 6%	3,5	Ω
1984	10,5	2009	4,8	4,8	3,9	3,5% - 5,5%	0,0	§
1985	4,7	Post-IT		$\overline{x}$	MAD		Average	
1986	5,8	average	8,7	= 8,7	= 2,8		= 2,4	3/5 or 60,0%
1987	9,3							
1988	8,0							
1989	6,4							
1990	7,8							
1991	9,4							
1992	7,5							
1993	9,7							
1994	8,5							
1995	9,4							
1996	7,0							
1997	6,2							
1998	58,0							
1999	20,8							
2000	3,8							
2001	11,5							
2002	11,8							
2003	6,8							
2004	6,1							
Pre-IT average	11,2							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period
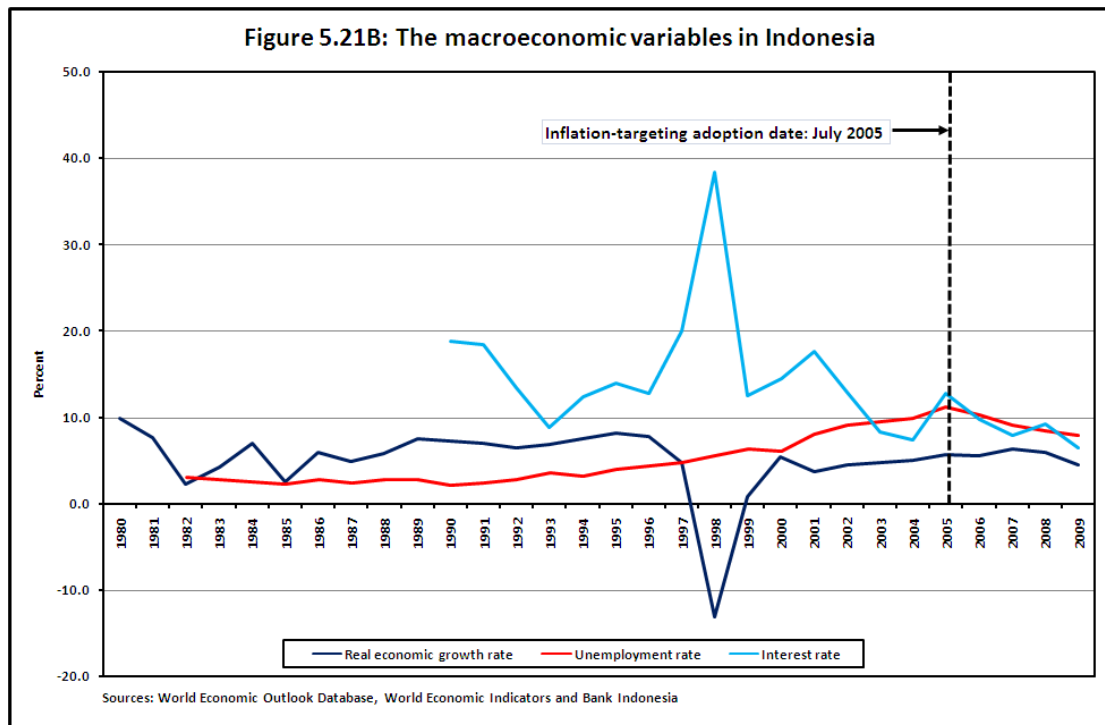
5.2.21.2   *Target achievement*

Evidence presented by Table 5.21 and Figure 5.21A show that inflation targets were hardly achieved with target overshooting dominating the inflation-targeting period, placing Indonesia, along with South Africa, as tenth among inflation-targeting countries. In fact, the set inflation targets were achieved in two of five times, or 40,0%, while targets were missed in three of five times, or by 60,0%. Therefore, Indonesia and South Africa exhibit similar inflation-target achievement performances. Although Indonesia recorded fewer large target misses than South Africa did, that is three versus four, the average deviation of the inflation rate from the set target of 2,4% is 1,1% higher than the rate recorded in South Africa. Nevertheless, a similar, average deviation of the inflation rate from the set targets was recorded in Iceland during the targeting period (see Table 5.25 in the Appendix B section).

Figure 5.21A: The inflation targets and actual rates in Indonesia

Source: World Economic Outlook Database
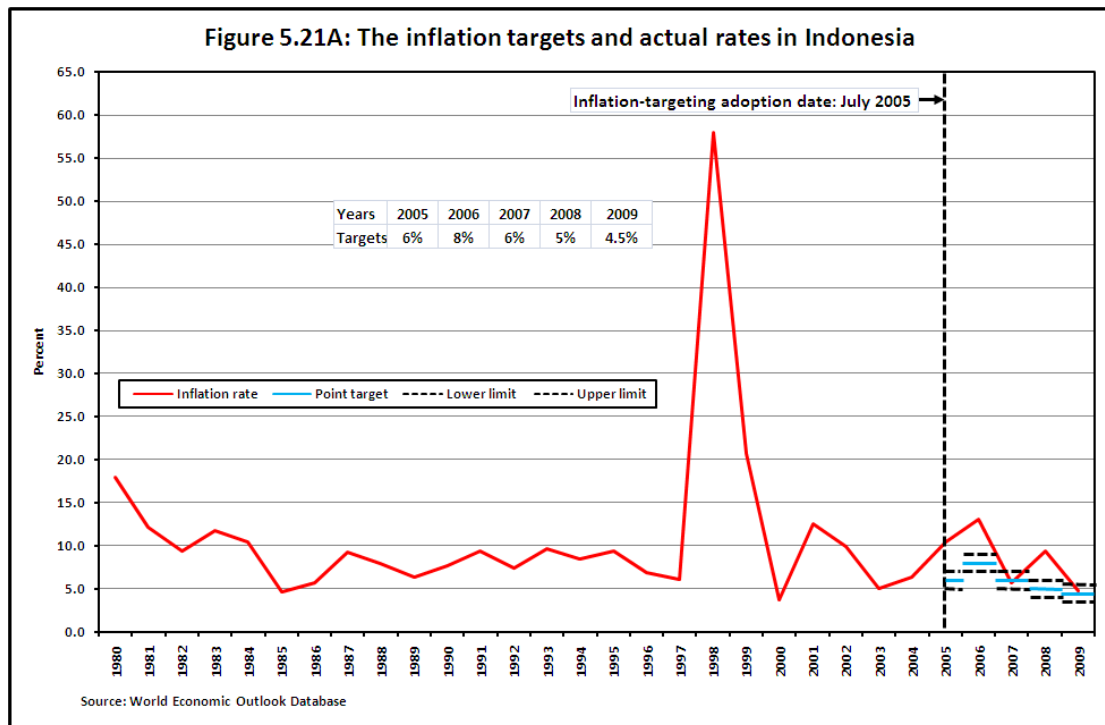
5.2.21.3 *Economic growth, unemployment and interest rates*

Figure 5.21B typifies that, as opposed to the pre-inflation-targeting period, the pace of the economic growth rate accelerated during the inflation-targeting period, despite external shocks such as the oil prices, and harsh economic conditions that embrace the global economy. On average, the economic growth increased from 5,0% recorded in 1980 to 2004, to 5,6% during the inflation-targeting period. Moreover, economic growth was more stable during the inflation-targeting period than prior to it being introduced. The average rate of unemployment, however, increased from 4,5% recorded between 1980 and 2004, to 9,4% during the inflation-targeting period. This rate is far higher than the rates experienced by other Asian inflation-targeting countries, that is, South Korea and Thailand. During the inflation-targeting period, Indonesia also experienced a lower interest-rate environment when compared to the historical standard of the country. A decline in the average interest rate from a double-digit rate of 15,4% to a single-digit rate of 9,3% was recorded during the inflation-targeting period. Nevertheless, Indonesia's economic growth, unemployment figures, and interest rates performance lag behind the performance of South Korea and that of Thailand.

Figure 5.21B: The macroeconomic variables in Indonesia

Sources: World Economic Outlook Database, World Economic Indicators and Bank Indonesia

5.2.22 Romania

Direct inflation targeting was mentioned for the first time in the government-drawn "Preaccession Economic Programme" in 2001. After an adjustment phase including institutional reforms to meet the requirements for inflation targeting, the National Bank of Romania (NBR) formally switched to an inflation-targeting framework in August 2005 (Daianu & Kallai 2008).

5.2.22.1 Lowering the inflation rate

Table 5.22 displays that the Romanian performance and track record regarding the reduction of the inflation rate improved in the last several years especially after the inflation-targeting framework had been implemented. It further indicates that after the adoption of the inflation-targeting framework, the average inflation rate declined from a double-digit rate of more than 50,0% to a single-digit rate of 6,8%. This is an

outstanding performance by the historical standard of the country, and it was achieved within a short period of time, that is, in five years. Table 5.27 in the Appendix D section shows that the mean absolute deviation is 1,3%, a rate closely aligned to the rates of other emerging-market countries such as, among others, Hungary (1,6%), Colombia (1,6%), Peru (1,3%), Chile (1,2%), and South Korea (1,2%). Moreover, inflation volatility also declined during the inflation-targeting period when compared with the period under other monetary-policy frameworks.

Table 5.22: The inflation rate in Romania

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	1,5	2005	9,0	9,0	2,2	6,5% - 8,5%	0,5	Ω
1981	2,2	2006	6,6	6,6	0,2	4% - 6%	0,6	Ω
1982	16,9	2007	4,8	4,8	2,0	3% - 5%	0,0	§
1983	4,7	2008	7,9	7,9	1,1	2,8% - 4,8%	3,1	Ω
1984	-0,3	2009	5,6	5,6	1,2	2,5% - 4,5%	1,1	Ω
1985	-0,2	Post-IT		$\bar{x}$	MAD		Average	
1986	0,7	average	6,8	= 6,8	= 1,3		= 1,1	4/5 or 80,0%
1987	1,1							
1988	2,6							
1989	0,9							
1990	127,9							
1991	161,1							
1992	210,4							
1993	256,1							
1994	136,7							
1995	32,3							
1996	38,8							
1997	154,8							
1998	59,1							
1999	45,8							
2000	45,7							
2001	34,5							
2002	22,5							
2003	15,3							
2004	11,9							
Pre-IT average	55,3							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.22.2   Target achievement

Despite the fact that the inflation rate declined during the inflation-targeting period, Figure 5.22A indicates that Romania has had limited success in achieving inflation targets with target overshooting dominating the poor inflation-targeting experience of the country. In its five years' experience of inflation targeting, the set targets were
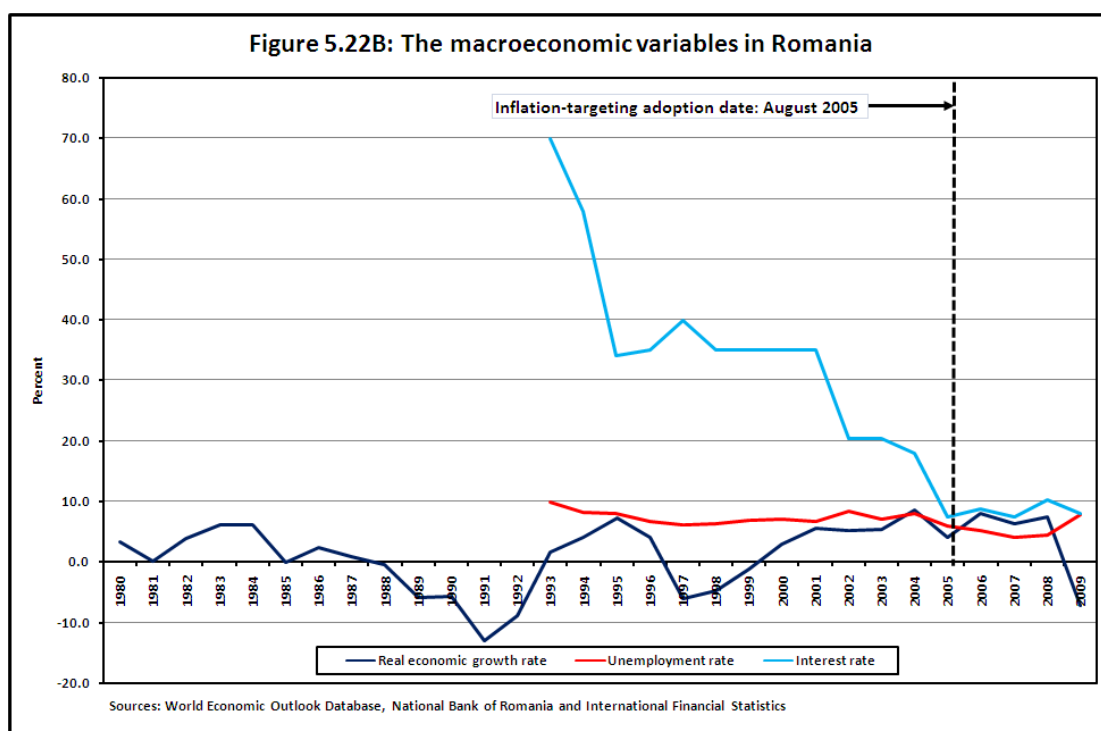
achieved once only, or by 20,0%. The inflation-targeting experience in Romania is characterised by four target misses, with two of four target misses by larger margins. Thus, inflation targets were missed in 80,0% of the inflation-targeting experience in Romania, placing the country among the worst inflation-targeting performers. In fact, Romania is the second worst performer among the inflation-targeting countries (see Figure 5.25 in the Appendix A section). Even though the country performed dismally in terms of target achievements, the average deviation of the inflation rate from the set targets is 1,1%, and on par with the average rate recorded in Hungary. Moreover, this rate is comparable with average rates recorded in other emerging-market countries (see Table 5.25 in the Appendix B section).

Figure 5.22A: The inflation targets and actual rates in Romania
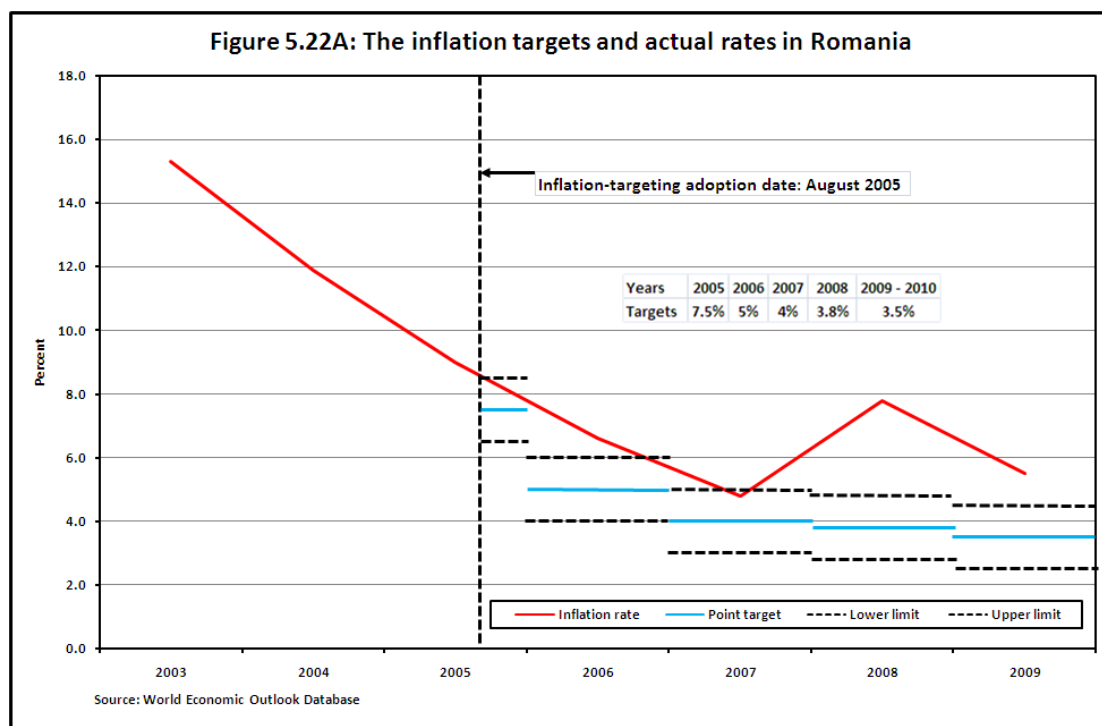
5.2.22.3   Economic growth, unemployment and interest rates

Although relatively modest from a comparative perspective, the inflation-targeting framework brings a series of benefits for the central bank in Romania, including

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remarkable economic growth. Moreover, unemployment, and interest-rates performance was also outstanding during the inflation-targeting period. Romania experienced a favourable and stable economic growth rate during the inflation-targeting period. On average, the economic growth increased from 0,8% recorded from 1980 to 2004, to 3,7% during the inflation-targeting period. Moreover, economic growth became more stable after the inflation-targeting framework had been adopted. Better economic growth during the inflation-targeting period managed to reduce the unemployment rate in the country from an average rate of 7,4% recorded from 1980 to 2004, to 5,5% during the targeting period. Although the interest rate increased during the greater part of the inflation-targeting period, it remained lower and stable on average than rates experienced under other monetary-policy frameworks. In fact, the average interest rate was 36,3% between 1993 and 2004, declining to 8,4% during the inflation-targeting period. Further information on the inflation-targeting performance in Romania can be found in, but not limited to, Daianu and Kallai (2008).

Figure 5.22B: The macroeconomic variables in Romania

Sources: World Economic Outlook Database, National Bank of Romania and International Financial Statistics

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5.2.23 Turkey

Turkey has undergone important changes in her monetary-policy frameworks. The country shifted from some form of intermediate exchange-rate regime before 2002 to implicit inflation targeting in 2002 to 2005. A formal inflation-targeting framework was first implemented in 2006. However, the stabilisation policy based on a crawling exchange-rate peg adopted in 2000 ended up in the deepest financial crisis of Turkish history in February 2001. This crisis was caused by the failure of the public sector to maintain austerity targets and fully implement the free-market rationale of globalisation. Pressures emanating from the process of integration with the global capital markets exacerbated this financial crisis. In response to the 2001 financial crisis, the Central Bank of Turkey (CBT) implemented an implicit inflation-targeting framework in 2002. Under implicit inflation targeting, two nominal anchors -- monetary targeting and inflation targeting -- were used to guide monetary-policy decisions. The primary aim of the implicit inflation targeting was to reduce future uncertainties about monetary policy and influence inflation expectations (Leigh & Rossi 2002). Moreover, the adoption of the implicit inflation-targeting framework was most probably the most viable alternative at the time, particularly given the lack of certain inflation-targeting preconditions (Hasan & Fatih 2008). Turkey failed to fulfil most of the stringent set of inflation-targeting preconditions such as the absence of fiscal dominance and the independence of the central bank. Thus, Turkey acknowledges that adopting inflation targeting with premature initial conditions could do more harm than good and could lead to a loss of credibility for both the CBT and the inflation-targeting framework itself. The implicit inflation-targeting period was replaced by formal inflation targeting at the beginning of 2006. The move to adopt a formal inflation-targeting framework was specified in the letter of intent submitted to

the IMF in November 2001 (Vuslat 2007; Hasan & Fatih 2008; *Central Bank of the Republic of Turkey Inflation Report* 2008).

5.2.23.1   Lowering the inflation rate

Table 5.23 points out that since the adoption of an inflation-targeting framework, inflation remained relatively low and stable. Moreover, it shows that the inflation rate declined from an average of more than 50,0% from 1980 to 2005 to 8,8% during the inflation-targeting period. This remarkable performance was achieved in a shorter period of time of four years and was possible despite the negative effect of the recent global economic crisis in the economy. The mean absolute deviation of 1,2% in Turkey is on par with those of other emerging-market economies such as Chile and South Korea (see Table 5.27 in the Appendix D section). This rate is still comparable with rates of other inflation-targeting countries from both industrialised and emerging-market economies. Among others, see the mean absolute deviation of New Zealand; Australia; Hungary; Colombia; Romania; and Peru (see Table 5.25 in the Appendix B section). Moreover, inflation volatility decreased after the adoption of the inflation-targeting framework when compared with the period under other monetary-policy frameworks.
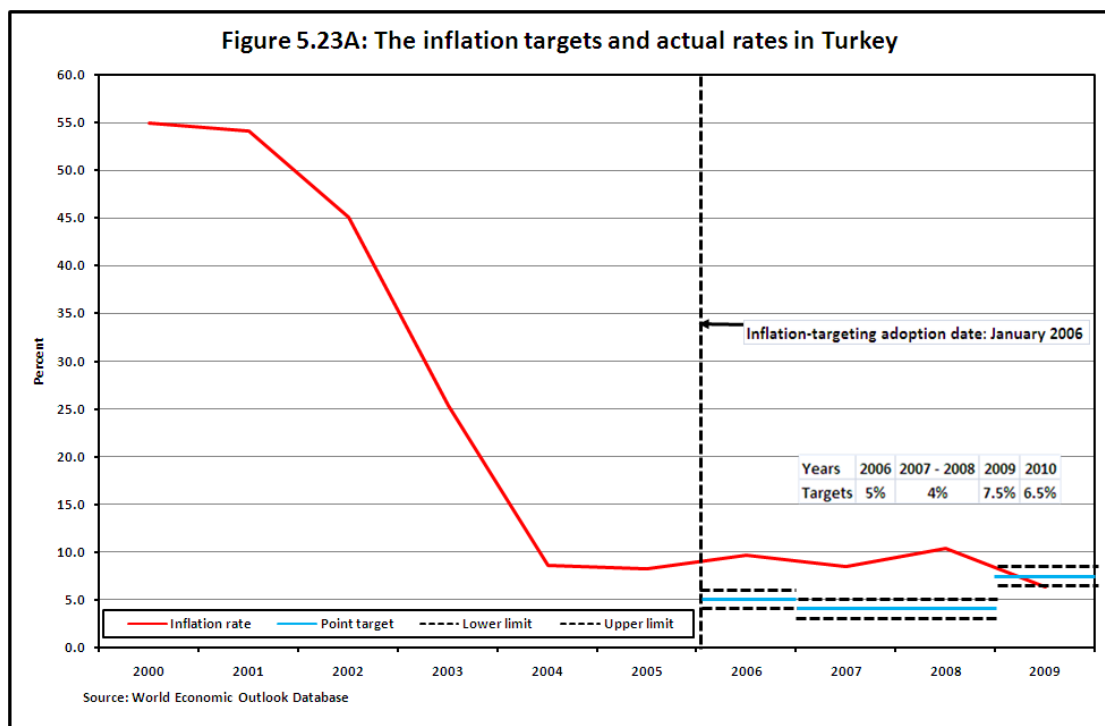
Table 5.23: The inflation rate in Turkey

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	110,6	2006	9,6	9,6	0,8	4% - 6%	3,6	Ω
1981	36,4	2007	8,8	8,8	0,0	3% - 5%	3,8	Ω
1982	31,1	2008	10,4	10,4	1,6	3% - 5%	5,4	Ω
1983	31,3	2009	6,3	6,3	2,5	6,5% - 8,5%	0,2	Ω
1984	48,4	Post-IT		$\bar{x}$	MAD		Average	
1985	31,9	average	8,8	= 8,8	= 1,2		= 3,3	4/4 or 100,0%
1986	50,0							
1987	45,8							
1988	71,4							
1989	60,0							
1990	57,3							
1991	62,9							
1992	72,0							
1993	65,2							
1994	104,3							
1995	89,6							
1996	80,2							
1997	85,7							
1998	84,7							
1999	64,9							
2000	55,0							
2001	54,2							
2002	45,1							
2003	25,3							
2004	8,6							
2005	8,2							
Pre-IT average	56,9							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period
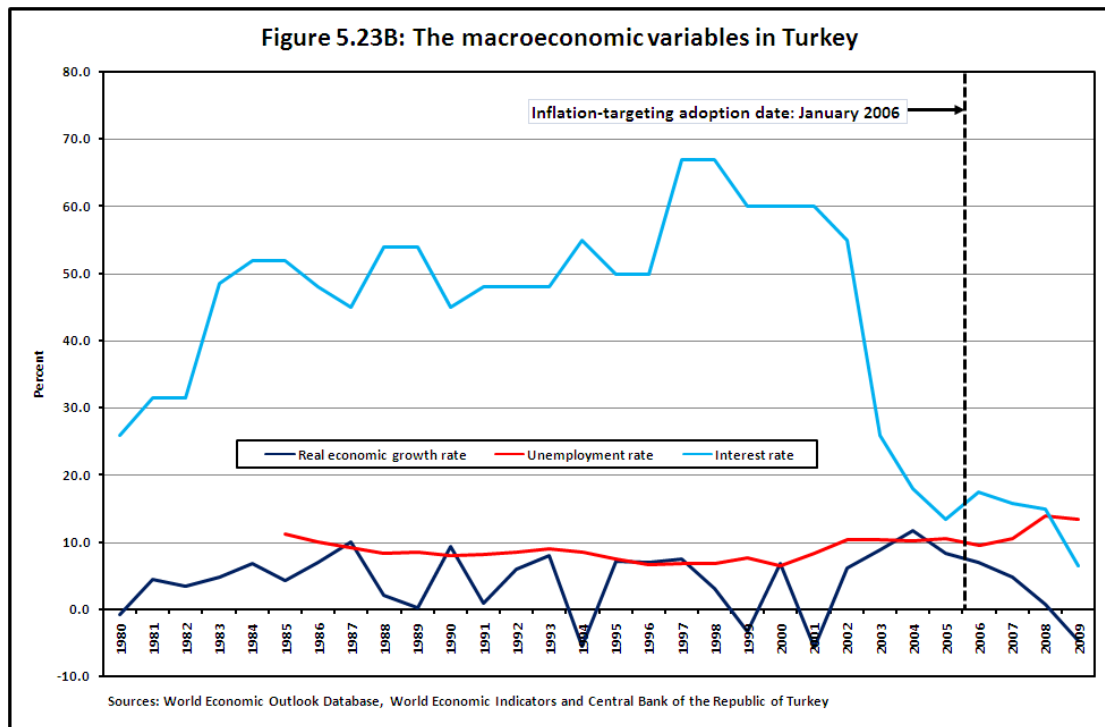
5.2.23.2 Target achievement

Table 5.23 and Figure 5.23A reveal that actual inflation rate was missed by mostly overshooting the targets during the inflation-targeting period, while undershooting the target occurred only once, in 2009. Thus, the inflation targets were missed throughout the inflation-targeting period, or by 100,0%, making Turkey, along with Ghana, one of the worst inflation-targeting performers among inflation-targeting

countries. In fact, Turkey and Ghana occupy the last spot on the inflation-targeting performance rankings as illustrated in Figure 5.25 in the Appendix A section. This dismal performance is despite the fact that Turkey has the widest uncertainty band when compared with all inflation-targeting countries using a similar measure. In three of four times, the set inflation targets were missed by larger margins and, as a result, the average deviation of inflation rate from the set target was 3,3%, the second highest rate on record by inflation-targeting countries. Moreover, as inflation increased to 10,74% in May 2008, and medium-term inflation expectations increased, the central bank in its letter to the government proposed raising inflation targets for 2009 to 2011 from 4,0% to 7,5% for 2009; 6,5% for 2010; and 5,5% for 2011. This move makes Turkey the first inflation-targeting country to raise inflation targets after missing them so poorly amid the current global financial turmoil (*Central Bank of the Republic of Turkey Annual Report* 2007; Freedman & Ötker-Robe 2009).

Figure 5.23A: The inflation targets and actual rates in Turkey

Years	2006	2007 - 2008	2009	2010
Targets	5%	4%	7.5%	6.5%

Source: World Economic Outlook Database

5.2.23.3   *Economic growth, unemployment and interest rates*

Figure 5.23B shows that the dismal inflation-targeting performance of Turkey was not limited to target achievement only. Instead, such performance is conspicuous in other areas, such as economic growth and the unemployment rate. In fact, the average economic growth declined from a rate of 4,6% recorded between 1980 to 2005 to a meagre 1,9% during the inflation-targeting period. Albeit decreasing economic growth, its volatility was better during the inflation-targeting period than before the inflation-targeting framework had been adopted. Poor inflation-targeting performance during the targeting period was also recorded with regard to the unemployment rate. In effect, the average unemployment rate increased from 8,7% recorded from 1985 to 2005 to 11,9% during the inflation-targeting period. Nevertheless, some progress was made in lowering the interest rates during the targeting period. Figure 5.23B shows that the average interest rate declined from 46,7% in 1980 to 2005 to historically low rates of 13,7% during the inflation-targeting period. The lower average interest rate during the inflation-targeting period was achieved despite the fact that the actual inflation rate remained outside the inflation-target ranges of the central bank throughout the inflation-targeting period. Even though the average interest rate declined during the inflation-targeting period, this rate is still higher by international comparisons. Nevertheless, the interest rate was more stable during the inflation-targeting period than under other monetary-policy frameworks. See Ozer and Mutluer (2005) for further information on the inflation-targeting performance of Turkey.

Figure 5.23B: The macroeconomic variables in Turkey

Inflation-targeting adoption date: January 2006

Real economic growth rate — Unemployment rate — Interest rate

Sources: World Economic Outlook Database, World Economic Indicators and Central Bank of the Republic of Turkey

5.2.24 Ghana

Following South Africa, Ghana became the second sub-Saharan country to adopt an inflation-targeting framework in May 2007. Prior to the announcement of inflation targeting, the Bank of Ghana (BOG) had already been operating according to an informal inflation-targeting framework since 2002 (Hammond 2009). The move to adopt the inflation-targeting framework was motivated by the less than satisfactory performance of the previous monetary-policy regime, and the BOG Act of 2002, which granted the central bank operational independence.

5.2.24.1 Lowering the inflation rate

Although it is too early to tell how inflation targeting is working, this study examines recent trends in inflation to better understand the dynamics of the average price level. Table 5.24 shows that Ghana has no success with the inflation-targeting framework, suggesting that it is still premature to evaluate the inflation-targeting performance of

the country. However, preliminary evidence suggests that the average inflation rate decreased from a double-digit rate of more than 30,0% recorded from 1980 to 2006, to 15,2% during the inflation-targeting period. Even though the inflation rate declined during the inflation-targeting period, it is higher than the average rates recorded in other inflation-targeting countries. A decline in the average inflation rate was accompanied by a significant reduction of inflation volatility during the inflation-targeting period. However, Ghana has the highest mean absolute deviation of 3,0% among inflation-targeting countries, suggesting that its inflation volatility is among the highest by international comparisons. This rate outpaced the rates recorded in Indonesia and Iceland by 0,5% (see Table 5.25 in the Appendix B section).

Table 5.24: The inflation rate in Ghana

Years	Inflation rates	Years	Inflation rates	x	$x - \bar{x}$	Target bands	Target miss	Beyond bands or percentages
1980	50,0	2007	10,7	10,7	4,5	0% - 10%	0,7	Ω
1981	116,5	2008	16,5	16,5	1,3	0% - 10%	6,5	Ω
1982	22,3	2009	18,5	18,5	3,3	0% - 10%	8,5	Ω
1983	122,9	Post-IT		$\bar{x}$	MAD		Average	
1984	39,7	average	15,2	= 15,2	= 3,0		= 5,2	3/3 or 100,0%
1985	10,3							
1986	24,6							
1987	39,8							
1988	31,4							
1989	25,2							
1990	37,3							
1991	18,0							
1992	10,1							
1993	25,0							
1994	24,9							
1995	59,5							
1996	44,4							
1997	24,8							
1998	19,2							
1999	12,4							
2000	25,2							
2001	32,9							
2002	14,8							
2003	26,7							
2004	12,6							
2005	15,1							
2006	10,2							
Pre-IT average	33,2							

MAD = mean absolute deviation, § = target achievement, Ω = target miss. Beyond bands is the number of times that inflation is outside the band during the targeting period

5.2.24.2   Target achievement

Ghana introduced inflation targeting at the same time that the pressure on food and fuel prices began to intensify. This created a significant challenge for keeping inflation within the target range. Table 5.24 and Figure 5.24A show inflation-targeting

experience of Ghana. They illustrate that target achievements in Ghana remained an elusive goal during the inflation-targeting period. In fact, the actual inflation rate remained above the set target throughout the targeting period, that is, inflation targets were missed in three of three times, or by 100,0%, a similar performance as that of Turkey, and Ghana ranks 17th among the inflation-targeting countries (see Figure 5.25 in the Appendix A section). Inflation targets were missed by large margins in two of three target misses, leading to the worst or highest average rate of inflation deviation, namely 5,3%, from the set targets among inflation-targeting countries (see Table 5.25 in the Appendix B section).

Figure 5.24A: The inflation targets and actual rates in Ghana

Source: World Economic Outlook Database
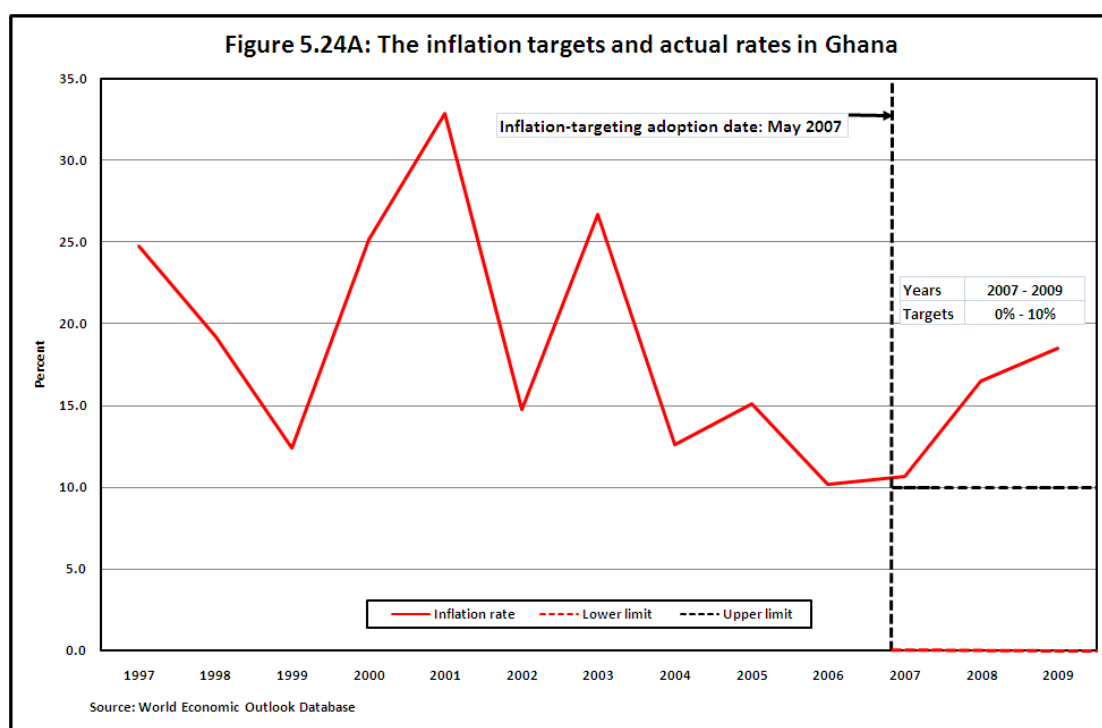
5.2.24.3   Economic growth, unemployment and interest rates

Although there is a lack of unemployment and interest-rate data on the Ghanaian economy, limited available data paint the following picture about inflation-targeting performance in the country:

i.   First, economic growth increased from an average rate of 3,7% recorded from 1980 to 2006 to 5,8% during the inflation-targeting period (see Figure 5.24B). This performance demonstrates that the Ghanaian economy was resilience to shocks, recording strong growth performance amid rising international crude oil prices; and

ii.   Second, based on the rate of unemployment estimations in Ghana, Figure 5.24B shows that the average rate of unemployment was 20,0% between 2001 to 2006, declining to an average of 17,0% during the inflation-targeting period.

Nonetheless, Figure 5.24B shows that the interest rate increased during the inflation-targeting period, but remained lower on average than the rates experienced prior to the formal adoption of the inflation-targeting framework. In fact, the interest rate decreased from an average rate of 20,0% recorded from 2003 to 2006, to 14,4% during the inflation-targeting period. See the *Bank of Ghana Annual Report (2007)* for further information on the inflation-targeting performance of Ghana.

Figure 5.24B: The macroeconomic variables in Ghana

Inflation-targeting adoption date: May 2007

Real economic growth rate — Unemployment rate — Interest rate

Sources: World Economic Outlook Database, Bank of Ghana and World Factbook
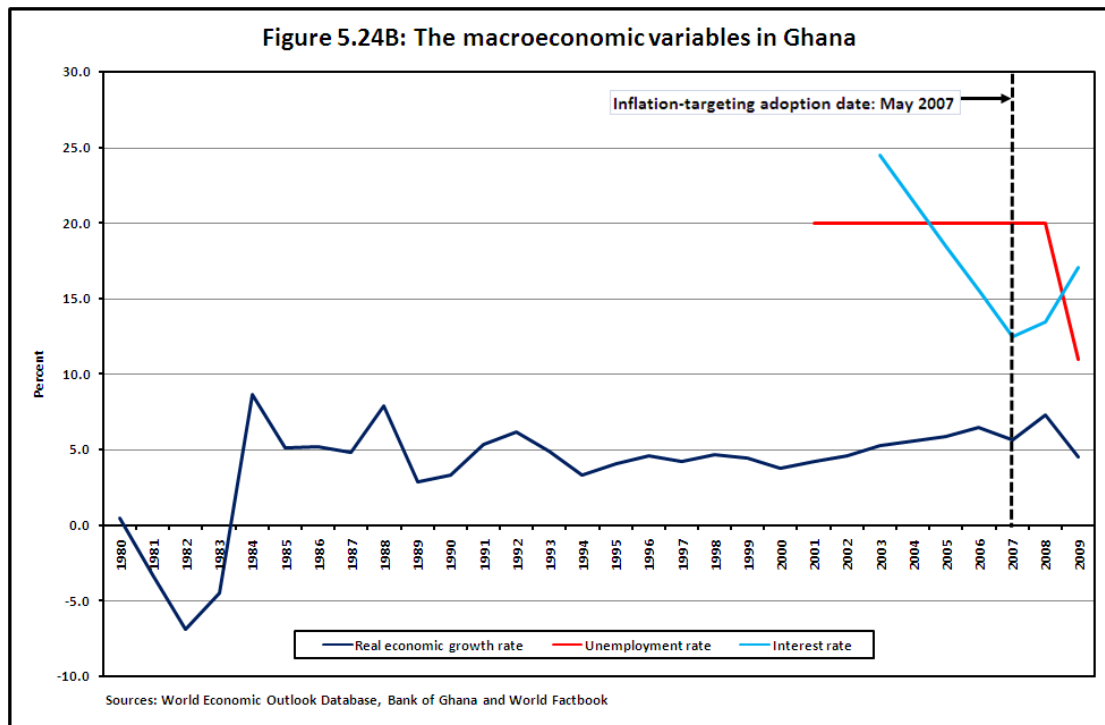
5.2.25 Serbia

In January 2009, the National Bank of Serbia (NBS) formally implemented an inflation-targeting framework. This move was highlighted in a memorandum in December 2008 and followed an implicit inflation-targeting framework from August 2006 until December 2008. Reasons for adopting the inflation-targeting framework include the consequences of prospective structural alterations, a higher degree of opening to the European Union (EU), and a higher degree of increasing the effectiveness of monetary policy.

Serbia is hence the latest country to join an increasing number of inflation-targeting countries. However, there is still a long way to go before its performance can be evaluated. At the time of completing this study, Serbia's limited inflation-targeting experience made it impossible to evaluate its performance and to come to a meaningful conclusion. As result, its experience did not form part of this study.

5.3 SUMMARY

In Chapter Five, the focus was on the international experience with inflation targeting. The analysis of the experience of inflation-targeting countries reveals some important findings that are worth noting.

i. On the face of it, inflation targeting has proven to be successful. The performance of inflation-targeting countries compares well with that of other countries in terms of lowering inflation, making inflation it less volatile; achieving higher output growth; lowering output volatility; and reducing inflation expectations (Bernanke *et al.* 1999a; Neumann & von Hagen 2002; Goncalves & Carvalho 2009; Corbo *et al.* 2001; Casteleijn 1999).

ii. The extent to which the better macroeconomic performance in inflation-targeting countries can be credited exclusively to the change in the monetary-policy regime, is still not clear. This dilemma can be attributed to the fact that in most countries that have adopted the inflation-targeting framework, the change in the monetary-policy framework has been part of a more wide-ranging set of structural and policy reforms, including substantial fiscal consolidation. However, it is also hard to argue that all the improvements in the macroeconomic performance of the inflation targeters can be attributed to factors other than monetary policy.

iii. The current global economic crisis that began in mid-2007 is causing a major rethink on monetary policy and has shown that inflation targeting is no guarantee against major macroeconomic and financial instability.

Although inflation targeting has been generally successful, the experience of the inflation-targeting countries has not been without difficulties, and there are a number

of dangers that could affect its continuation and proliferations. For example, most countries (particularly emerging-market economies) experienced considerable swings in their exchange rates (Dogde 2005). Moreover, the jury is still out as to whether or not inflation targeting has passed the test of sustainability in the face of persistent shocks. Preliminary evidence, however, suggests that inflation pressures from these shocks have abated, but the challenge to policy-makers remains. However, even if no additional central banks were to adopt inflation targeting, or if some current inflation targeters abandon it, particularly based on the results of the sustainability test, inflation targeting will have a lasting impact on the way in which central banks operate (Walsh 2009). Moreover, empirical evidence indicates that inflation targeting has worked well in a broad range of countries and circumstances.

CHAPTER SIX

CONCLUSION:

LIMITATIONS AND POLICY RECOMMENDATIONS

6.1   SUMMARY OF THE STUDY

The purpose of this study was to determine whether inflation targeting is an appropriate monetary-policy framework or not. To achieve this objective, the study first defined the concept of inflation targeting; evaluated monetary-policy alternatives to the inflation-targeting framework; examined the case for and against inflation targeting; and assessed international experience regarding inflation targeting. The findings, policy implications and recommendations of this study are presented in this final chapter. It also highlights the most promising avenues for future research.

6.2   MAIN FINDINGS, POLICY IMPLICATIONS AND RECOMMENDATIONS

6.2.1   Main findings

In the process of providing answers to the research questions posed in this study, it was found that there are many misunderstandings by the public about monetary-policy goals and the inflation-targeting framework.

Objectives or goals have become important to provide clear guidance to policy-makers on the goals to pursue under different circumstances, and have received much attention in the sphere of policy-making. Thus far, the author has not found any consensus on what is considered to be the proper goals of monetary policy and, further, there are splitting views on the role of monetary policy. This dilemma is due to the differing ways in which contrasting quarters weigh other macroeconomic variables -- except inflation -- and what can and cannot be achieved by monetary policy. Some advocate that monetary policy, in addition to price stability, can and should be targeted at employment; exchange-rate stability; economic growth; and even at some distributional objectives. However, it is imperative to recognise that any single arm of economic policy cannot effectively pursue all monetary-policy goals. These include inflation, economic growth, the rate of unemployment, investment, poverty, and social welfare. The analysis of the research questions (or data) showed that the unemployment rate is minimised when an economy operates as productively as possible. Moreover, the rate of unemployment can be reduced by measures that directly affect incentives and conditions in the labour market itself. This is a sphere in which government is actively involved by setting in place long-term interventions such as opportunities for increasing skills; investment in economic infrastructure; by promulgating applicable labour laws; by raising educational standards and bettering social policies; and by demonstrating leadership that is committed to economic growth and broader development. It is clear that these factors do not fall within the ambit of the operation of the monetary-policy of a central bank. As a result, a monetary policy *per se* is irrelevant to the unemployment rate, and any attempt by central banks to keep unemployment below the natural rate will lead to higher, accelerating inflation and raised expectations regarding inflation without reducing the rate of unemployment.

The solution for higher economic growth is a range of real variables and other supply-side factors that include better government policies and a general economic environment to which monetary policy contributes; the quantity and productivity of labour; capital; land; and infrastructure in the economy; as well as the general regulatory environment that (should) include the efficiency of government and the judicial system. Further, factors such as, for instance, the terms of trade, are also relevant. This is because the level of the terms of trade may impact on economic growth. A high terms of trade increases returns to producers and so raises investment and hence economic growth. Furthermore, countries with sustained economic growth have demonstrated that improvements in productivity improve living standards, not monetary policy as some politicians would lead people to believe.

It was also found that monetary-policy goals (objectives) are not easily simultaneously attainable in practice. The fundamental problem regarding the attainment of these goals simultaneously is that, given the way the economy works, several of the objectives are usually in conflict with one another. Central banks that operate under these arrangements are faced by a significant challenge of communicating their thinking to the public as their legally mandated objectives require divergent monetary-policy actions. Thus, multiple objectives can hamper the effectiveness of a central bank, dilute its accountability, and complicate the co-ordination of economic policy with government. Moreover, simultaneous commitment to stabilise different variables by using a single-policy instrument offers a promise that cannot possibly be fulfilled in general. It perhaps suggests that there should be as many instruments as there are objectives if all the objectives are to be fulfilled. Moreover, a singular or clearly ranked objective reduces any room for uncertainty about what will take priority in the decision-making process of a central bank, and may avoid a possible problem in time inconsistency that has the potential to lead to an inflationary bias. Therefore, there are severe limits to what central banks can do,

even with the best policies. For some information on the debate about monetary policy goals, see Cecchetti (2000).

This study further found that the most opposition to inflation targeting can be traced to a concern that other goals of macroeconomic policy will be neglected if the central bank were to adopt inflation targeting. Thus, due recognition is not always accorded the role that inflation targeting plays in securing sustainable economic activity. In general, however, most central banks use the medium to long term as their target horizons, which suggests that other objectives are being accorded at least some weight. It may not be a simple task, however, for an outside observer to evaluate these relative weights.

On the question of whether inflation targeting is an appropriate framework for monetary policy, the study exposed that it is not necessary an appropriate monetary-policy framework for pursuing all monetary-policy goals. In principle, other frameworks could also provide the required nominal anchor while ensuring the flexibility needed to promote overall economic stability. Moreover, such a regime could also provide better results than the inflation-targeting framework. However, given the nature of monetary-policy goals in the world today, inflation targeting outshines other policy alternatives and, although imperfect, it does lack some of the drawbacks of other policy frameworks. Thus, as a system of maintaining a medium-run focus on controlling inflation, communicating clearly with the public about ultimate objectives of monetary policy, and by providing a measure of accountability, inflation targeting dominates alternative monetary-policy frameworks. Hence, the inflation-targeting approach is the best available framework for achieving set policy objectives.

This is further evident from the fact that, although the inflation-targeting framework faced its most severe challenge since its inception in the form of recent global

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turmoil, no central bank has yet given up the inflation-targeting framework -- at least not so far -- in favour of other monetary-policy frameworks, and two decades have already passed since this framework has been practised around the world. It then implies that the practice has been in place in some countries since the late 1980s or the early 1990s, or even later. Moreover, the inflation-targeting framework is still in place despite recent calls to abandon it owing to the magnitude, duration, and frequency of the target misses recorded during the inflation-targeting period. The research in this study suggests that perhaps central banks have realised that the problem of dealing with supply-side shocks is not unique to the inflation-targeting framework. Any monetary-policy framework will be faced by this challenge and the result may be even worse than the results obtained under the inflation-targeting framework. As a result, inflation targeting proved to be a durable monetary-policy framework to weather economic shocks, despite being a relative newcomer among monetary-policy frameworks. Moreover, the current crisis should not cast doubt on the use of inflation targeting. This is because countries have been affected regardless of whether they had implemented inflation targeting. For example, the USA, which was the epicentre of the crisis, does not use inflation targeting.

Furthermore, it was also found that, should an appropriate monetary-policy framework provide a nominal anchor and contributes towards reducing economic instability, the policies followed by inflation-targeting central banks are appropriate monetary policies. Yet they may not be the only way one might choose to conduct a monetary policy.

Regarding the recent inflation-targeting debate, this study has found that it is natural, particularly in turbulent and uncertain times, that there will be differences of opinion as to what the appropriate framework and stance of monetary policy should be. Moreover, there is growing recognition, though still controversial, that the monetary-

policy frameworks under inflation targeting have failed. However, many commentators on the appropriateness of an inflation-targeting framework often seem to misunderstand what the framework entails. It is a framework, not a rule or an instrument. Neither is inflation targeting an anti-inflation policy as such. Without too much emphasis on inflation targeting, it is still clear that monetary policy, policy instruments, and the need for low inflation remain. What really matters for a monetary policy to be successful, is establishing a strong nominal anchor. Although inflation targeting is one way to achieve this, it is not the only way, yet it has proven to be a credible, better, and superior anchor for monetary policy to date. In fact, there are strong theoretical justifications (as pointed out in Chapter Three) in favour of inflation targeting.

Although inflation targeting reduced the rate and volatility of inflation in inflation-targeting countries, it was found that inflation did not remain within the target at all times. This was neither possible nor always desirable in a world characterised by significant economic shocks. Inaccurate knowledge about the structure of the economy, the transmission mechanism of the monetary policy, and policy outcomes make it impossible to reach target exactly and repeatedly all the time.

6.2.2 Policy implications

The adoption of inflation targeting, however, does not guarantee better macroeconomic performance. Moreover, the appropriateness of the inflation-targeting framework as a monetary-policy framework that controls inflation, is transparent, and provides measures of accountability. Yet it does not mean that it is a panacea to all problems, hence inflation targeting is not a perfect framework in all economic circumstances. Hence it is vital that targeting countries go beyond the

implementation of this policy framework to reap all the benefits possible from it. The benefits of inflation targeting are dependent on the prevailing economic conditions, the co-ordination of fiscal and monetary policies, support from stakeholders, and the like. It is further essential that governments ensure that the perceived benefits of inflation targeting do materialise, thereby suggesting that there will be room for improving the inflation-targeting framework in practice. This entails ensuring that the public, the government, and the central banks work together to promote the benefits of inflation targeting.

6.2.3   Policy recommendations

Based on the findings discussed above, this section provides some recommendations on how to improve the effectiveness of the inflation-targeting framework. The following is recommended:

This study has shown that, while inflation targeting is being tested and facing its most severe challenges since its inception in the current global turmoil, it remains the best possible policy with which to stabilise inflation and the macroeconomic environment. In this context, this framework should not be abandoned. As has been observed elsewhere in this regard, even if one were to take away inflation targeting, the monetary policy and instruments remain, and the central banks still have a constitutional mandate to maintain low inflation. Moreover, there are compelling reasons in favour of the inflation-targeting framework which include, among others, positive macroeconomic performance; lower interest rates that translate to a larger interest-rate differential when compared with non-inflation-targeting countries; and dealing with deflation pressures. This framework has thus far shown itself to be the framework most likely to pass the test of time. There may be an argument that some,

if not all of these effects, have been due to exogenous variables such as prudent fiscal policy, sustained global growth over the inflation-targeting period; or a better investment climate. Nonetheless, it can be seen that the implementation of inflation targeting has not had any observable negative effect on macroeconomic stability and growth. However, this does not suggest that inflation targeting is a universal remedy to all macroeconomic problems that face central banks. Neither does the absence of negative effect on macroeconomic stability and growth suggest that there is no room for improving the inflation-targeting framework. The need for continuous improvement of the inflation-targeting framework is exacerbated by the political, economic, social and international environment of central banks that is in constant flux. On the contrary, policy-makers should improve the operation of the inflation-targeting framework were necessary and keep abreast with new developments. Thus, the central banks should have the ability to adapt to different changing environment. This ensures that the inflation-targeting framework remains viable and competitive.

In the beginning of 2008, the most immediate problems for many policy-makers were high supply-side shocks, such as higher commodity and fuel prices, and their effect on inflation. In this context, some voiced their concerns that inflation targets should be adjusted upward to accommodate supply-side shocks adverse effect on the economy and inflation. This study highlights that any move to adjust inflation targets upward ignores the trade-off between the probability of successfully achieving the targets and the usefulness of targets as a communications device designed to influence expectations. Moreover, higher inflation targets will cost the economy too much as they anchor inflation expectations at a higher level. Thus, an increase in expected inflation translates into higher inflation. As a result, this study does not recommend that the inflation targets should be adjusted upward. Instead, it recommends that a continuing strong commitment to retain the same inflation target is exactly what is needed at the current juncture. This is because narrower bands

with more frequent breaches are not necessary a detrimental development. It is the target misses that provide central banks with the opportunity to explain in public why inflation has temporarily moved higher or lower than the targets, and to show that they have a consistent policy for ensuring a return to low inflation. This public disclosure reveals the ability of the central bank for self-reflection, and a willingness to learn from past mistakes. If the bank does not discuss its mistakes, they will be discussed by journalists and analysts using simple and usually less precise methods that will reach less favourable conclusions for the central bank. Moreover, publishing the analysis of the central bank may further enhance public knowledge of the target and transmission mechanisms of the monetary policy, especially knowledge of the transmission lag between the measures of the central bank and their biggest impact on the economy. Consequently, accountability is strengthened by this process and solves the dilemma of the limited accountability of an independent central bank.

Although disinflation before inflation targeting does not guarantee lower inflation after the implementation of the inflation-targeting framework, this study recommends that authorities should first embark on the disinflation process before adopting a full-fledged inflation-targeting framework. This process is necessary to lower inflation to rates consistent with price stability (0 to 3,0%), and avoid the loss of public credibility on higher inflation targets and targets misses. In fact, this practice was followed by the inflation-targeting countries that used an implicit inflation targeting to lower their inflation before implementing a full-fledged inflation-targeting framework. Moreover, during the disinflation or transition period, possible inflation targeters will measure themselves against a set of inflation-targeting requirements such as, among others, the independence of the central bank; sound fiscal policy, a well-developed financial system; and the absence of a nominal anchor other than inflation.

Even though the inflation-targeting requirements as such do not serve as obstacles to the implementation of the inflation-targeting framework or steps are taken to satisfy the requirements after inflation targeting has been implemented, this study recommends that aspiring inflation-targeting countries should establish at least basic conditions for the effective functioning of the inflation-targeting framework. It is not necessary for all requirements to be fully met before the implementation of inflation targeting. However, the issue of requirements is complicated by the following aspects:

i. There is no consensus regarding the set of necessary preconditions that a country must satisfy before inflation targeting.

ii. The feasibility and success of inflation targeting depend more on the commitment and ability of the authorities to plan and drive institutional change after the introduction of the new framework.

iii. Special requirements are necessary for any monetary-policy framework to be successful – be it inflation, the exchange rate, or monetary-aggregate targeting (Roger 2009).

Thus, an inflation-targeting framework supported by the basic conditions is more likely to succeed than the one without them or, in different words, the basic conditions are supportive policies that are crucial for the success of inflation targeting.

Despite what politicians may want the public to believe, there are limitations to a monetary policy, particularly regarding the promotion of economic growth and employment. Any attempt to deal with these issues through monetary policy represents a promise that cannot be fulfilled. As a result, the central proposition of this study remains the same as the contention of other analysts of inflation targeting,

that is, a monetary policy can only achieve price stability which helps to create an economic environment that fosters maximum sustainable growth. Consequently, this study recommends that governments should refrain from assigning multiple and conflicting goals or goals that cannot be achieved by monetary policy to the central banks.

As Blackman (1999) indicated, no two central banks are exactly alike. At the same time, central banks are quite dissimilar in their constitutions. Nor is it the case that the issues to be addressed are identical at all times in all places. Moreover, countries differ in size, structural features and development level. Accordingly, inflation-targeting countries should modify the inflation-targeting framework more to suit their unique economic circumstances.

Three years ago, White (2008) posed the question as to whether price stability was adequate and/or sufficient. The answer to this question is not clear cut and depends largely on the economic circumstances of a country. Under normal circumstances, the short answer in the author's view is 'yes' and 'no' -- in extra-ordinary times. Price stability is not appropriate always and everywhere. The recent prolonged period of financial turmoil which started in the USA makes it clear that financial stability cannot be taken for granted. This is because price stability cannot be effectively achieved if attention of the central bank is not directed to the evolution and development of the surrounding environment. Therefore, central banks should tackle serious financial imbalances or act to prevent financial imbalances from cumulating over time. Perhaps this highlights why the conduct of monetary policy affords some discretion to policy-makers. Strict adherence to an invariant policy stance is unlikely to yield optimal outcomes when circumstances change dramatically – as they have done in recent times. Therefore, this study recommends an in-depth research on the possibility of including other objectives such as financial stability in the conduct of the

inflation-targeting framework. As is evident from the evidence of the subprime crisis -- the worst financial crisis in history -- financial instability has the potential to cause significant macro-economic costs by interfering negatively with production, consumption, and investment, and is detrimental to the broader goals of sustainable and sustained economic growth, full or rising employment, and societal development. Moreover, during the current global economic crisis, the risk to inflation emanated from movements in food price pressures, commodity prices and the escalation in fuel and energy prices. The magnitude of the inflationary pressures has been such that target breaches in many inflation-targeting countries were inevitable. As a result most central banks were outside their target ranges in 2008 with the extent of deviation from target being much greater and persistent in emerging-market economies.

Supply-side shocks such commodity price shocks provide a particular challenge to monetary policy. It is generally accepted that while central banks should respond to demand shocks, there is very little that can be done about the first-round effects of supply-side shocks. Consequently, this study recommends an in-depth research on how the inflation-targeting framework can effectively deal with the supply-side shocks problem. Perhaps this research could also cover a number of related issues such as, among others, an appropriate horizon of a monetary-policy framework under supply-side shocks, interest-rate setting in response to severe supply-side shocks, and preparation of the central banks for future developments in the price of oil.

6.3   LIMITATIONS OF THE STUDY AND AREAS FOR FURTHER RESEARCH

6.3.1   Limitations of the study

This study is faced with a number of limitations that include, among others, the following: it focuses more on the inflation-targeting experience of various countries, rather than on group experiences, that is, countries were not, for instance, classified together depending on their level of economic development. This leaves the findings of the study more open to interpretation and thus possibly more subjective due to its descriptive (qualitative) nature as its findings cannot be generalised due to the unique circumstances in each country. The study failed to establish a causal link between improved macroeconomic outcomes and inflation targeting, which could place its findings in doubt. While various premises on which the study relies have been empirically tested, they are subject to much debate. Further, limited historical data particularly for emerging-market economies made it difficult to evaluate their macroeconomic performances for a longer period.

6.3.2   Areas for further research

Finally, based on the aforementioned limitations, the following areas of further research are suggested:

i.   What should countries do before adopting the inflation-targeting framework?

This study recommends that possible inflation targeters should reduce the rate of inflation to single-digit levels before adopting the inflation-targeting framework.

Lowering the rate of inflation should take place under an implicit inflation-targeting period. The primary purpose of reducing the inflation rate to a single-digit rate is to enhance credibility of the inflation targets. Thus, higher inflation targets are less credible and vice versa. As a result, possible inflation targeters are faced with a trade-off between the probability of successfully achieving the inflation targets and the usefulness of targets as a communications device designed to influence expectations. The wider the range, the higher the probability of successfully achieving the target, but target is then less useful for influencing behaviour.

ii.   *The establishment of alternative ways of dealing with cost-push inflation that has placed the appropriateness of the framework in doubt.*

The inflation targeting-framework deals with cost-push inflation by using, among others, an escape clause, adopting a target range instead of a point, and accommodating the first-round effect of supply-side shocks on inflation. However, the recent global economic crisis that originated in the USA seems to challenge this practice, perhaps suggesting that the time has come to investigate alternative approaches of dealing with cost-push inflation under an inflation-targeting framework. This is because critics of the inflation-targeting framework argue that the attention of central banks was limited to inflation. As a result, their monetary policy actions exacerbated the current global economic crisis. Therefore, the longer the economic recovery remains weak, the less relevant the existing inflation-targeting framework will become.

iii. The possibility of including other objectives in the inflation-targeting framework, and to which extent they can be included

Most central banks have a role in both price and financial stability. However, the role of financial stability was ignored for a long time. The current global crisis revived the role of financial stability in monetary policy, that is, how should monetary policy react to asset-price bubbles or more generally to financial instability. Financial crises are costly and complex. Nevertheless, monetary authorities have limited tools to deal with a financial crisis once it has broken out and there is little they can do other than attempt to limit the damage caused by the financial crisis on the rest of the economy. This makes prevention an important strategy. Central banks have traditionally focused on treating financial crises, but they also have an important role in helping to prevent them. Perhaps the time has come to investigate how central banks can fulfil their fundamental objective of financial stability, in addition to their inflation-targeting objectives. This study will assist to evaluate the knowledge of the central banks about potential trade-offs between price stability and financial stability in the short run, although these objectives are complementary in the long run.

iv. Establishing to which extent the better macroeconomic performance in inflation-targeting countries could be credited to the inflation-targeting framework

It is difficult to document large differences in inflation performance between explicit inflation targeters and non-inflation targeters over the past decade. This is not to say that there were no differences, but that the differences appear to be rather subtle. Some observers have attributed the success of inflation targeters in reducing inflation to the global disinflation of the 1990s. As a result, inflation-targeting countries are considered to be lucky. This issue has not been completely resolved since then.

Hence, this study recommends research on the link between improved macroeconomic performance and the inflation-targeting framework that will possibly settle this debate. Thus, additional research and experience pertaining to inflation targeting will help to clarify the reasons for these performance patterns.

v.   The effects on monetary policy of innovations of financial products and in the financial markets

The current financial turmoil reminds policy-makers that financial innovation is not a smooth process and its impact on the conduct of monetary policy is challenging. In this regard, an appropriate knowledge of monetary-transmission mechanisms is of crucial importance for central banks. Financial innovation affects transmission mechanisms both by altering the channels through which monetary policy operates, and by changing the overall impact of monetary-policy decisions. Financial innovation can help to increase the efficiency of the financial system, which facilitates the operation of monetary policy, but at the same time it complicates the environment in which monetary policy operates. As a result, this study recommends further research on the impact of financial innovations on monetary policy.

vi.   An investigation of the appropriate target measure under an inflation-targeting framework

This study has found that Thailand has the best inflation-targeting performance among the inflation-targeting countries. This performance was still possible despite the emerging-market status of the country; adverse external shocks such rising oil prices; and recurring exchange-rate shocks during the inflation-targeting period. However, a close examination of the inflation-targeting practice in Thailand reveals that core inflation instead of headline inflation is used as an inflation-targeting

measure. In fact, Thailand is the only country in this study that uses core inflation for inflation-targeting purposes. The exceptional inflation-targeting performance of the country perhaps suggests that core inflation -- rather than headline inflation -- is the best inflation-targeting measure. This is contrary to the popular belief among central banks that headline inflation is an appropriate inflation-targeting measure. As a result, this finding revived an old debate regarding the appropriate measure to target inflation and suggests that the debate on the appropriate measure to target inflation is not yet settled. Hence, this study suggests further research on this issue.

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APPENDICES

APPENDIX A

Figure 5.25: Performance rankings of inflation targeting
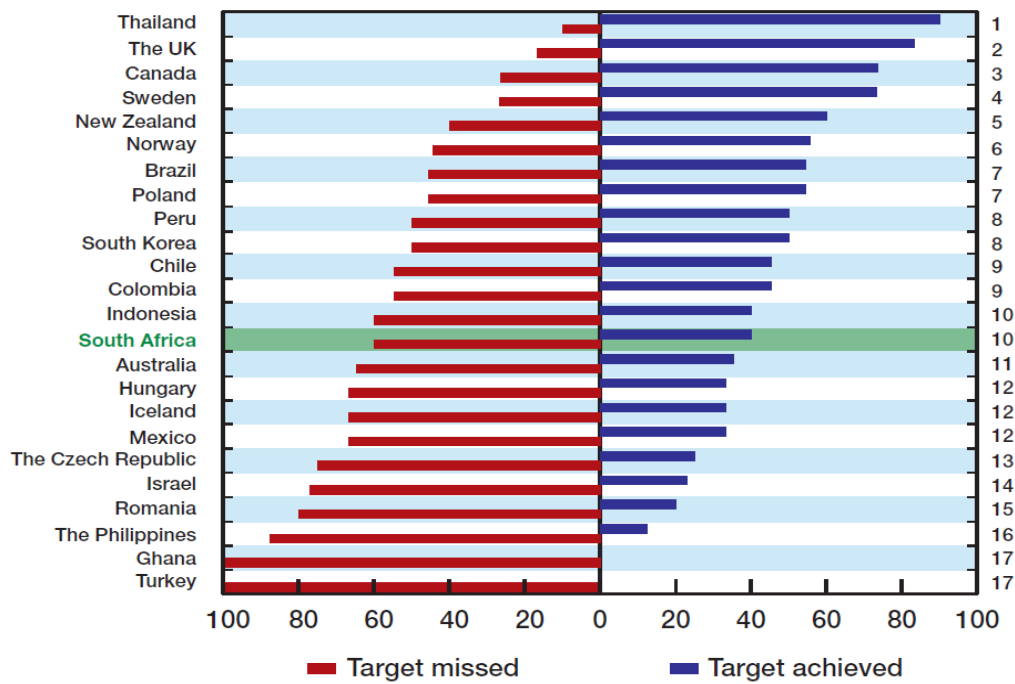
Source: The author and the websites of the central banks.

APPENDIX B

Table 5.25: Inflation-targeting countries - MAD and average deviation from targets

Country	MAD	Avarage deviation from targets
New Zealand	1,0	0,3
Canada	0,7	0,2
The UK	0,6	0,1
Sweden	0,8	0,1
Australia	1,0	0,6
Israel	2,3	1,0
The Czech Republic	2,0	1,2
South Korea	1,2	0,2
Poland	2,1	0,8
Brazil	1,9	1,0
Chile	1,2	0,7
Colombia	1,6	0,9
South Africa	**2,3**	**1,3**
Thailand	0,7	0,02
Mexico	0,6	0,5
Iceland	2,8	2,4
Norway	0,9	0,3
Hungary	1,6	1,1
Peru	1,3	0,6
The Philippines	2,1	1,5
Indonesia	2,8	2,4
Romania	1,3	1,1
Turkey	1,2	3,3
Ghana	3,0	5,2
Average	**1.6**	**1,1**

Source: The author and the websites of the central banks.

APPENDIX C

Table 5.26: Industrialised countries - mean, MAD and average deviation from targets

Country	Mean	MAD	Avarage deviation from targets
New Zealand	2,3	1,0	0,3
Canada	2,0	0,3	0,2
The UK	2,1	0,6	0,1
Sweden	1,8	0,9	0,1
Australia	2,7	1,0	0,6
Iceland	6,4	2,8	2,4
Norway	2,0	0,9	0,3
Averages	**2,8**	**1,1**	**0,6**

Source: The author and the websites of the central banks.

APPENDIX D

Table 5.27: Emerging-market economies - mean, MAD and average deviation from targets

Country	Mean	MAD	Avarage deviation from targets
Israel	3,1	2,3	1,0
The Czech Republic	3,4	2,0	1,2
Poland	3,9	2,1	0,8
Brazil	6,7	1,9	1,0
Chile	3,5	1,2	0,7
Columbia	6,7	1,6	0,9
South Africa	**5,3**	**2,3**	**1,3**
Thailand	1,1	0,7	0,02
South Korea	3,3	1,2	0,2
Mexico	4,7	0,6	0,5
Hungary	5,7	1,6	1,1
Peru	2,6	1,3	0,6
The Philippines	5,2	2,1	1,5
Indonesia	8,7	2,8	2,4
Romania	6,8	1,3	1,1
Turkey	8,8	1,2	3,3
Ghana	15,2	3,0	5,2
Averages	**5,6**	**1,7**	**1,3**

Source: The author and the websites of the central banks.

APPENDIX E

Table 7: Prospective candidates for inflation targeting

Near term: 1 - 2 years	Costa Rica, Egypt, Ukraine	Technical assistance (TA) requested or received
Medium term: 3 - 5 years	Albania, Armenia, Botswana, Dominican Republic, Mauritius, Uganda	Technical assistance (TA) requested or received
	Angola, Azerbaijan, Georgia, Guinea, Morocco, Pakistan, Paraguay	No technical assistance (TA) requested or received
Long term: more than 5 years	Belarus, China, Kenya, Kyrgyz Republic, Moldova, Sri Lanka, Vietnam, Zambia	Technical assistance (TA) requested or received
	Bolivia, Honduras, Nigeria, Papua New Guinea, Sudan, Tunisia, Uruguay, Venezuela	No technical assistance (TA) requested or received

Source: IMF, 2006, " Inflation targeting and the IMF", Tables 1 and 2the central banks.