Inflation targets in a global context

Gabriel Sterne[1]

Prepared for the Fourth Annual Conference at the Central Bank of Chile:
10 years of inflation targeting: design, performance, challenges

Santiago, Chile, November 30 – December 1, 2000

Abstract

Inflation targeting has become an increasingly global framework, used by countries of many different types and in all the continents of the world. To assess its global contribution, this paper uses one of the broadest ever surveys of monetary policy frameworks to construct an overall picture from the individual jigsaw pieces of country frameworks. The jigsaw is made up of targets and other measures of policy reaction, institutional characteristics such as independence, accountability and transparency, and analytical capacities within the central bank. The paper notes that the use of inflation targets has spread very rapidly in the 1990s, far more so than has the number of "inflation targeting" frameworks. The analysis focuses on the flexible use of inflation (and money) targets, and how these relate to indicators of central bank reaction functions, independence, accountability, transparency, and analytical methods. The use of targets appears to have built a strong momentum towards the explanation of policy, and the use of inflation targets in particular has provided a vehicle for communication between central banks and governments and the private sector.

JEL codes: B22 E31 E41 E52 E58

[1] gabriel.sterne@bankofengland.co.uk Centre for Central Banking Studies, Bank of England. The author is grateful to Bill Allen, DeAnne Julius, Maxwell Fry, Joe Ganley, Lavan Mahadeva, Klaus Schmidt-Hebbel, Peter Sinclair and Katerina Smidkova for helpful comments, and to all those central banks that took part in the survey on which the paper is based. Any views expressed are those of the author and not those of the Bank of England.

1. Introduction

Inflation targeting has become a global framework. There is an inflation targeting country in every continent and many others have introduced to their framework particular characteristics of inflation targeting. And inflation targeting has proved so far to be a durable framework. No country has dropped its inflation target, other than to join a monetary union.

Assessing the global contribution of inflation targeting in pioneering new design options for framework designers is, however, complicated. Drawing lessons only from a narrowly-defined group of countries commonly labelled as inflation targeters may understate its contribution in influencing frameworks in a very wide range of countries. Conversely, it is also possible to overstate its contribution, since many of the characteristics of inflation-targeting have been previously used in other frameworks. The Bundesbank, for example, has clearly stated its numerical inflation and money objectives over a number of years, and, according to Posen (2000) the transparency with which the Bundesbank explained expected deviations from these objectives is a model for emerging economies. Similarly, the forward-looking nature of policy discussions at the Federal Reserve and the Bundesbank were important influences on the Bank of England's framework when it began inflation targeting (King, 2000).

To provide an accurate assessment of the wider contribution of inflation targeting we need therefore to look more widely at global developments in monetary framework design. An objective of this paper is therefore to focus on the relationship between the jigsaw pieces of characteristics that together form a monetary policy framework. It assesses not just the experience of those countries recognised as operating inflation targeting frameworks, but on the monetary frameworks of a total of 94 economies using the results of a survey contained in Fry, Julius, Mahadeva, Roger and Sterne (2000) (henceforth FJMRS). Theirs is the broadest ever survey of monetary framework design and contains questions relating to central bank objectives, targets, independence, accountability, transparency and analytical capacities of central banks.

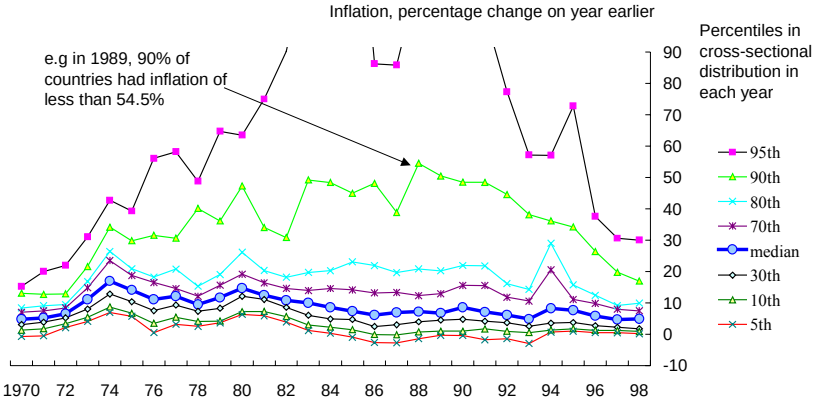
The following section sets the scene by reviewing international performance in achieving stable inflation since 1970 using various alternative nominal anchors. Sections 3 and 4 address the roles of inflation targeting as seen by practitioners, compare these with more formal definitions of inflation-targeting provided in the literature, and then goes on to outline how we shall use a broadly-based survey of monetary framework characteristics to place the contribution of inflation targeting in a global context. Sections 5 to 7 present some results of the survey, focusing on how targets have been used, and relating their use to other framework characteristics of independence, transparency and analysis. Section 8 concludes.

2. Setting the scene: the search for inflation stability over three decades

Judging by the outcomes for inflation, the search for a nominal anchor has become more successful in the 1990s. Declines in inflation have been shared across many different types of economies. Inflation has fallen across the spectrum of low, medium and high inflation economies. The chart illustrates the cross-sectional distribution of inflation rates across 91 economies for which continuous inflation data exist between 1970 and 1998. For example, the lowest line on the chart is the 5th percentile of the global inflation distribution, and the lowest point on this 5th percentile line shows that in 1993, 5% of countries in the sample had inflation below -3% (i.e. deflation of over 3%). In contrast, the upper line represents the 95th percentile and in some years it goes off the scale. Inflation fell sharply across a very wide distribution of economies after 1994, and such reductions mirror the rapid increases in inflation following the oil price shocks of the 1970s but there is no causation in

1970s and 1990s. The chart shows that global inflation (across the entire distribution) is lower now than it has been since the start of the 1970s.

Chart 2.1.
Cross Sectional distribution of inflation rates in 91 economies, 1970 to 1998



Note: Data taken from 91 developing and industrialised economies for which data are available in each year 1970 to 1998. Data for 1997 and 1998 includes estimates
Source: World Development Indicators (World Bank) and International Financial Statistics (IMF).

We also use the data to establish some circumstances in which inflation stability has occurred. We define a stable period of inflation as occurring when inflation remains within a particular range for a minimum of five years. Using data for 96[2] economies between 1970 and 1996,[3] we specify the ranges by splitting the sample according to percentiles in the entire distribution of inflation. Of the 2,520 annual observations:

1. 20% are less than 3.8%	*Hence:*	The very low inflation range is defined is as <3.8%
2. 40% are less than 7.4%,		The low inflation range is defined as 3.8% to 7.4%
3. 60% are less than 11.5%		The medium inflation range is defined as 7.4% to 11.5%
4. 80% are less than 19.7%		The high inflation range is defined as 11.5% to 19.7%
5. 20% are higher than 19.7%		The very high inflation range is defined as > 19.7%

The results established that very low inflation (below 3.8%) has been strongly associated with periods of stable inflation. Very low rates of inflation appear to provide inflation with its most natural home insofar as once inflation is low, it has been more likely to stick there than it has to become stuck at higher rates. Of the 70 occasions in the study in which inflation remained in a particular range for at least five years, a relatively high number of these, 27 (39%) of the total, were episodes of very low and stable inflation (less than 3.8%).

The data can also point to exchange rate targeting as being the most successful nominal anchor in terms of achieving periods of stable inflation.[4] 39 of the 70 stable-inflation episodes occurred when the country was targeting the exchange rate for all or most of the period. Industrialised countries have been far more successful than developing countries in achieving episodes of stable inflation within ranges of very low, low or medium inflation.[5] Over the past three decades, low stable inflation has occurred predominantly in Germany, the United States and Japan, and in the countries that successfully fixed their exchange rates to these large economies. More recently it has also been achieved by inflation-targeting countries and by Switzerland historically using money targeting.

[2] We have full data on the framework used in each year for the 96 economies, but full inflation data for 5 of these is lacking.
[3] The analysis does not include transitional economies, as their time series are not long enough.
[4] Data for monetary frameworks came from Cottarelli and Giannini (1997), supplemented by IMF annual publications and the Bank of England survey
[5] This could be attributable both to policy and to a greater prevalence of exogenous shocks such as commodity prices.

The analysis also highlights the poor historical performance of domestic anchors in emerging economies, and the consequent gap that might be filled by the developments in monetary frameworks. At a time when a number of emerging economies have been pushed by currency crisis towards a floating exchange rate regime[6], there is no example of a developing economy having achieved very low or low stable inflation through relying on a domestic policy anchor[7]. The 14 episodes of very low or low stable inflation in developing economies have all been achieved through exchange-rate targeting, in other words "borrowing monetary credibility" from abroad. There are no precedents in these data for developing and transitional economies successfully using a domestic nominal anchor to achieve periods of inflation stability.

The poor historical record of developing countries in using domestic nominal anchors to achieve stable inflation is not necessarily suggestive of a similar future performance. The likelihood of improving inflation performance within individual countries thanks to the advances made in the technology of monetary frameworks, ranging from reduced provision for fiscal deficit finance to greater independence, accountability and transparency of policy.

Section 3: The essence of inflation targeting: practitioners' views

Inflation targeting has received positive mid-term reports in some of the countries in which it has been implemented, where it is widely regarded as having contributed towards achieving monetary stability.[8] In our attempts to focus on key issues concerning inflation targeting, the reflections of framework practitioners are a good place to identify the most important themes and questions. Over 50 central bank governors and deputy governors addressed the issue of monetary policy frameworks at the Bank of England in June 1999. Josef Tošovskỳ of the Czech National Bank framed the key issue in the choice of framework design in nautical terms: As "navigators aboard the good ship *Monetary Policy*", we search not just for an explicit target to provide a nominal anchor, but for institutional arrangements that constitute a harbour for safe anchorage. The discussion provided an overview of the nature and the importance of inflation targeting from the point of view of practitioners.[9] The Governors represented four countries that had a number of years experience with inflation targeting (Canada, Czech Republic, New Zealand and the United Kingdom) and many others that have more recently implemented an inflation targeting regime, or whose frameworks have been influenced by it.

3.1.i Does inflation targeting represent a sea-change in framework design?

Discussion indicated that practitioners generally perceived inflation targeting to be important in the evolving framework options, rather than viewing it in terms of a radical shift from previous frameworks. According to Mervyn King (Bank of England), when the Bank of England was deciding on its monetary framework following exit from the ERM, its choice of framework was influenced not just by central banks that had pioneered inflation targeting such as the Reserve Bank of New Zealand. King reported that "[We] looked at what we thought were broadly successful central banks

[6] Fischer and Sahay (2000), for example, note that only four transitional economies now had fixed exchange rate regimes in early 2000.

[7] India achieved stable inflation in the medium range in the 1990s using a discretionary policy that was based on managing − as opposed to pegging − its exchange rate.

[8] Haldane (1995) contains an early assessment of its use, while Bernanke, Laubach, Mishkin and Posen (1999) also compares inflation targeting frameworks with those used in Germany, Switzerland and the USA. In the context of emerging economies, the assessment of Blejer, Ize, Leone and Werlang (2000) leads them to conclude that the strategy should be considered further.

[9] The discussion is published in Mahadeva and Sterne (2000), pages 182-205

around the world, and let me take the examples of the Bundesbank and the Federal Reserve. Neither had an inflation target: one had a monetary target and the other had no quantified specific target at all, though it had general commitment to price stability and high employment. But, we asked ourselves, what sort of discussion took place in the Bundesbank Council and the FOMC? And it seemed to us that a good description of what they actually did was that they looked ahead to where inflation was likely to go in the absence of a policy change. And then they decided whether or not the likely inflation outcome was acceptable"

Any framework aims to keep inflation low in the long-run but to respond to shocks, an observation that prompted King to state that "an inflation target is not a new view of monetary economics or the monetary transmission mechanism." Christian Stals (Reserve Bank of South Africa) reinforced the view and expressed reservations about classifying countries into different frameworks: "[A] monetary policy framework is very much about presentation, transparency, explanation, and so on… I think there is only one particularly defined monetary policy framework: it can begin with an inflation target, and if you have an inflation target you have to control the growth in the money supply, and if you have to control the growth in the money supply you have some kind of restriction on bank credit extension, and if you have to control bank credit extension then you have a liquidity policy, and if you have a liquidity policy you have an interest-rate policy, and if it's all successful, then you have a stable exchange rate. So deciding in the end which one of those elements of the framework you use as a reference point or as an intermediate target or as a final target, you cannot ignore the other elements of that framework."

3.1.ii The Benefits of Inflation targets

The aspects of inflation targeting mentioned as being particularly important are its contribution to improving coordination between the fiscal and monetary authorities, to influence expectations of the private sector and to provide focus within the central bank itself. These contributions were, however, cited primarily by practitioners in low-inflation countries. Gordon Thiessen (Bank of Canada) commented that "it changes the way you make decisions and the way you describe decisions and I must say from my own personal point of view it has changed enormously my relationship with the House of Commons standing committee. Having an agreed target just changes the whole nature of these discussions and I think makes monetary policy more credible, more understandable, and less an issue of controversy than it was before." Similarly, Don Brash (Reserve Bank of New Zealand) argued that agreeing the inflation target with the government is "hugely beneficial." He argued that "having the target agreed with the government and known to the public greatly reduces the risk of government criticism of the central bank as long as the inflation rate is, and seems likely to remain, above the floor of the inflation target." The reason lies in the potential for improved fiscal-monetary coordination. Brash states that "if the government stipulates an inflation target that it wants the central bank to deliver, it implicitly states that, if fiscal policy is eased in a way that is inconsistent with that inflation target, the central bank will of necessity tighten monetary policy."

The target may also me useful in influencing the behaviour of the private sector. With reference to wage-setting, Brash reported that "When our inflation target was introduced, the trade union movement basically denounced it, and called the central bank Governor all kinds of unflattering names. But at the same time, they told their members that, as long as this undesirable policy was in place, the unions would have to restrain their wage demands, otherwise unemployment was going to go up. And I think inflation targeting really meant that unions recognised that they were no longer influencing the inflation rate, they were influencing the unemployment rate, and I think that was a very important learning point."

Similarly, King argues that the inflation target can be useful benchmark in explaining objectives and as a reference point to explain interest rate decisions. He argues that "it seems to be fundamental to get across to the public that the objective of monetary policy is solely to do with price stability in the long run." In terms of explaining particular policy decisions he argues that "there are many arguments for and against the use of monetary targets, but it is more difficult to explain to the population at large that a particular interest-rate decision was made in order to control the growth of a monetary aggregate. It is easier, I think, to explain if you can relate the decisions to something that is visible and comprehensible, and an inflation target has that great advantage."

Finally, several governors from a variety of economic types spoke of benefits of the inflation target to the internal workings of the central bank. Mervyn King argued that "it does give everyone in the central bank a very clear view as to what the domestic anchor for policy is. It is a common-sense approach to say that what we are trying to achieve is price stability, so let's be very clear and judge our success or failure by what happens to inflation." Josef Tošovskỳ (Czech National Bank**)** went even further by arguing that **"**inflation targeting changes the central bank completely. In our case, there were changes in organisation structure, in procedures, and in responsibilities and accountability of individual people in the central bank, including the board. So one breaks down the barriers and communicates very effectively with the general public. The 'kitchen' of monetary policy has to be open, showing what ingredients were used when the staff was preparing the forecast and what was behind a particular decision."

Summarising the arguments, inflation targeting has the potential to bring about improved credibility through affecting the incentives of policy-makers, even when a sound track record has not yet been established. This is explained by Tošovskỳ who stated that "perhaps the most important issue in the framework of inflation targeting [is] expectations. Inflation targeting helps to reach a certain consensus on the inflation outlook between trade unions, on the one hand, and the Government and of course central bank on the other. Gaining such agreement on the mix of policies - income policy, fiscal policy, and monetary policy - should be beneficial because it should reduce the cost of this inflation."

3.1.3 Under what circumstances should inflation targeting be implemented?

The Governors' indicated two approaches to this question. The first is voiced by Arminio Fraga (Brazil) who argued that "what we have realised in Brazil is that… it is very hard not to move towards inflation targeting once you have chosen to float." An extension of this argument would suggest that even if it were not possible to implement all the ingredients for an effective domestic nominal anchor based on inflation targeting, implementing some of them is better than the alternative of doing nothing.

Another approach is to focus on the pre-requisites and constraints to effective inflation targeting, all of which are similar to operating an effective money targeting or discretionary regime. Daudi Ballali (Bank of Tanzania) used the experience of Tanzania to illustrate the limitations of inflation targeting. "[W]hen the Treasury asks what is the size of reduction in the inflation rate that is achievable in the coming year, I just say, 'if you can give me the size of the deficit, then I can say what is achievable'. Similarly, Dr Matthews Chikaonda (Bank of Malawi) extends the nautical analogy in stating "what we need to do is to cross over to the other side of the harbour, the fiscal side, and bring those guys on board." In the UK too, Eddie George (Bank of England) felt that the success of the framework depended upon government support for it. He argued that "once [that] has been accepted at the political level and embodied in statute, or in the government endorsing or imposing a monetary or inflation target on the central bank, then this is a symptom which means that you can expect to have greater co-ordination on the fiscal side. And that is why the explicit endorsement by the political authorities in the country is absolutely crucial, in our experience, in implementing this regime."

The picture painted by the discussion is one in which inflation targeting has evolved to perform well as a domestic nominal anchor in countries where a boost to credibility was needed. The enhanced anchor has frequently been achieved by changing the commitment of the central bank towards a greater focus on price stability, improving fiscal-monetary coordination, and in affecting inflation expectations. Yet there was also widespread acknowledgement that a countries political and economic circumstances may affect framework design.

Section 4: Using definitions of monetary frameworks and inflation targeting

It is considerably easier to provide a general definition of a monetary framework than it is to identify precisely those components that distinguish between different types of monetary frameworks such as money targeting or inflation targeting. According to McNees (1987 p. 3) a monetary framework may be defined as "the institutional arrangements under which monetary policy decisions are made and executed." Necessarily, therefore, analysis of any monetary policy framework extends considerably beyond a particular target, and goes beyond the confines of the central bank. Monetary policy frameworks are normally politically determined, and may well depend, for example, on the country's financial institutions, and the degree of expertise in monetary policy matters that exists both inside and outside the central bank, as well as other institutional and structural economic features. With so many variable factors, one size does not fit all.

Inflation targeting is a particular type of monetary framework, and its emergence has suggested that a more robust nominal anchor may be available across a wide variety of economies. Bernanke, Laubach, Mishkin and Posen (1999) are amongst those to have pointed out that it involves "a framework not a rule." To draw lessons it is helpful to define the key characteristics of inflation targeting in those countries that have practised it, and this has been done by a number of authors (See Box 1). Yet although writers have captured the essence of inflation targeters in analogies such as "constrained discretion"[10] it has been more difficult to establish a consensus as to a precise definition that distinguishes "inflation targeting" "money targeting" and "discretionary" frameworks. The Box illustrates some of the core features of inflation and money targeting frameworks in industrialised economies as defined by various authors.

There are inevitable challenges to establishing a consensus on a clear and concise definition of inflation targeting. Definitions must in practice identify precise framework characteristics, yet defining essential characteristics of inflation targeting does not necessarily fit comfortably with the view that one-size does not fit all in monetary policy frameworks. Some definitions, for example, may be interpreted as overstating the relative importance of analytical methods or institutional characteristics to a particular framework. In labelling frameworks, a number of papers[11] have stressed both the importance of macro-econometric models in inflation targeting economies, and the problems in building and using such models in developing and transitional economies. Yet even in frameworks described by central banks as inflation targeting, the survey results indicate that judgmental forecasts are used just as frequently as model-based forecasts. Similarly, inflation targeting has re-emphasised the role of forward-looking policy and transparency, but these may be equally important in money-targeting, and even more important in discretionary frameworks. In addition, definitions that focus on the explicit variable targeted may not fully capture policy preferences. There are very few money targeters, for example, who would choose to adhere to a money target if there was clear evidence of a velocity shock.

[10] See Bernanke, Laubach, Mishkin and Posen (1999) p. 293

[11] For example, Masson, Savastano and Sharma (1997), Debelle and Hoon Lim (1998) (Philippines), Christoffersen and Wescott (1999) (Poland), and Hoffmaister (1999) (Korea).

In a global context, attempts to define who is and who is not inflation targeting can sometimes turn out to be an arbitrary exercise (see Section 6.2.i). Moreover, any exercise of establishing "pre-requisites" or "pre-conditions" to be an inflation targeter[12] may be counterproductive. Discussion of pre-requisites may be interpreted by practitioners as implying "Do not use an inflation target as an important part of your framework unless you already have in place transparency, central bank independence and sound forecasting capacity." Yet there is no firm evidence to my knowledge that introducing certain characteristics associated with inflation targeting should inevitably be sequenced in a particular order.

In particular, it could be beneficial to emphasise the importance of an inflation target even when if the other characteristics are not in place. Like other framework "inputs", an inflation target may have positive marginal productivity towards the "output" of monetary stability, irrespective of the state of the other framework inputs. Conceivably, for example, a carefully negotiated inflation target could contribute to improved coordination of fiscal and monetary policy, even if forecasting capacity is limited, central bank independence is restricted, and little effort is being made to explain policy to the public. There are indeed many examples in industrialised economies and emerging economies where the adoption of an inflation target appears to have preceded better coordination of fiscal and monetary policy and better forecasting performance, and greater central bank independence[13]. In short, frameworks choices may evolve in a number of ways to meet particular circumstances and there is a risk that focusing on pre-requisites to any particular framework may distract policymakers from pursuing an optimal choice.

[12] In the author's opinion the discussion of pre-requisites is a flaw in an otherwise excellent paper by Masson, Savastano and Sharma (1997)

[13] The Bank of England, for example, was not independent when until four years after it implemented inflation targeting, and its forecasting capacity was given impetus by the switch to inflation targeting.

Box 1 Definitions of Different Characteristics of Money and Inflation Targets

Study	Main Distinction Identified between Money and Inflation Targeting
Leiderman and Svensson (1995)	With reference to New Zealand, Canada, United Kingdom, Sweden and Finland the authors wrote "These inflation targeting regimes have two characteristics: (i) An explicit quantitative inflation target (specifying the index, the target level, the tolerance interval, the time frame, and possibly situations under which the inflation target will be modified or disregarded). (ii) The absence of an explicit intermediate target for monetary aggregates or exchange rates."
Masson, Savastano and Sharma (1997)	The authors mention four essential ingredients of inflation targeting: (i) "explicit quantitative targets for the rate of inflation some period(s) ahead" (ii) "clear and unambiguous indications that the attainment of the inflation target constitutes the overriding objective of monetary policy in the sense that it takes precedence over all other objectives" (iii) "a methodology ("model") for producing inflation forecasts that uses a number of variables and indicators containing information on future inflation"; and (iv) "a forward-looking operations procedure in which the setting of policy instruments depends upon the assessment of inflation pressures and where the inflation forecasts are used as the main intermediate target"
Cottarelli and Giannini (1997)	"Inflation Targeting" is not purely the announcement of some short-run inflation target by the government – something that to different degrees occurs in most countries - but the announcement of a targeted inflation path extending up to a few years ahead, coupled with the setting up of procedures for public monitoring of how the monetary authorities pursue their objective" [Money targeting] is "characterised by the announcement of a short-term intermediate target, either in the form of a monetary aggregate or of a (typically crawling) peg".
Mishkin (2000)	"Inflation targeting is a monetary-policy strategy that encompasses five main elements: (i) the public announcement of medium-term numerical targets for inflation; (ii) an institutional commitment to price stability as the primary goal of monetary policy, to which other goals are subordinated; (iii) an information-inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments; (iv) increased transparency of the monetary-policy strategy through communication with the public and the markets about the plans, objectives and decisions of the monetary authorities; and (v) increased accountability of the central bank for attaining its inflation objectives."

4.1 A survey-based approach to assessing the contribution of inflation targeting.

In this paper we argue that inflation targeting has characteristics. We shall investigate, for example, the extent to which inflation targets may be useful irrespective of the degree of transparency, accountability, independence or other elements of an inflation-targeting framework. And similarly we can assess the contribution of transparency to delivering price stability irrespective of whether or not an inflation target is used.

A clearer perspective on the contribution of inflation targeting is possible when the lessons from inflation targeting countries are compared with those from other economies that have developed

nominal anchors over recent decades[14]. Figure 1 summarises the characteristics from which a prototype monetary framework might be chosen, and in this paper we use information on each of these across a very broad group of 94 monetary frameworks that were surveyed in late 1988. The data are taken from a survey contained in Fry, Julius, Mahadeva, Roger and Sterne (2000) (henceforth FJMRS). The survey includes detailed information from 94 frameworks each covering a very large number of frameworks are shown in Table 4.1.

Table 4.1 Economies included in the survey

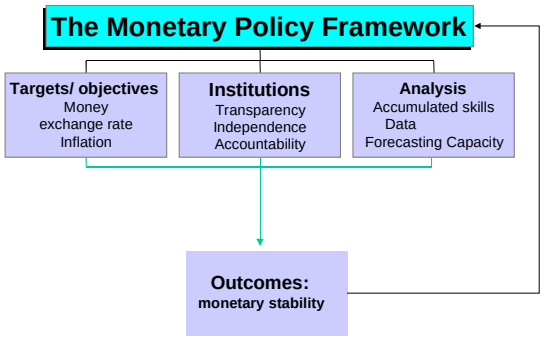
Industrialised	Transitional	Developing	
1. Australia	1. Albania	1. Argentina	23. Lebanon
2. Austria	2. Armenia	2. Bahamas	24. Malta
3. Belgium	3. Bosnia Herzegovina	3. Bahrain	25. Malaysia
4. Canada	4. Bulgaria	4. Bangladesh	26. Mauritius
5. Denmark	5. Croatia	5. Barbados	27. Mexico
6. Finland	6. Czech Republic	6. Belize	28. Mongolia
7. France	7. Estonia	7. Botswana	29. Mozambique
8. Germany	8. Georgia	8. Chile	30. Namibia
9. Greece	9. Hungary	9. China	31. Nigeria
10. Hong Kong	10. Kazakhstan	10. Cyprus	32. Peru
11. Iceland	11. Kyrgyz Republic	11. Eastern Caribbean	33. Sierra Leone
12. Ireland	12. Latvia	12. Ecuador	34. Sri Lanka
13. Israel	13. Lithuania	13. Egypt	35. South Africa
14. Italy	14. Macedonia	14. Fiji	36. Tanzania
15. Japan	15. Moldova	15. Ghana	37. Thailand
16. Korea	16. Poland	16. Guyana	38. Tonga
17. Netherlands	17. Russia	17. India	39. Turkey
18. New Zealand	18. Romania	18. Indonesia	40. Uganda
19. Norway	19. Slovakia	19. Jamaica	41. Uruguay
20. Portugal	20. Slovenia	20. Jordan	42. Vietnam
21. Singapore	21. Turkmenistan	21. Kenya	43. West African MU
22. Spain	22. Ukraine	22. Kuwait	44. Zambia
23. Sweden			
24. Switzerland			
25. Taiwan			
26. United Kingdom			
27. United States			
28. Euro Area (European Central Bank)			

Figure 1 forms the basis of the framework characteristics measured by FJMRS (2000). It is based on the presumption that there exist pre-requisites to monetary stability, rather than to any particular monetary framework. The figure illustrates the distinct characteristics that may contribute towards price stability. It would be difficult, however, to circle a group of these characteristics and identify them only with "inflation targeting" or "money targeting." There would be many exceptions. And even the most carefully constructed definitions of inflation targeting such as Mishkin's cannot exactly distinguish inflation targeting from money targeting frameworks, since effective money targeting might imply very similar ingredients.[15]

[14] None of the central banks from the largest three economies in the world, for example, describe their framework as inflation targeting

[15] See Posen's (2000) assessment of the post-war performance of the Bundesbank.

Figure 4.1: Monetary Framework Characteristics



In order to improve understanding of the interactions between objectives, constraints and the choice of policy framework instruments the survey sought to measure as fully as possible the characteristics of frameworks. The characteristics covered by the survey include:

The extent to which each country focuses on:

1 Exchange rate objectives
2 Money objectives
3 Inflation objectives

Institutional factors:

4 Independence of the central bank
5 Accountability of the central bank to government and parliament
6 Policy explanations: the extent to which the central bank provides the public with sufficient information to understand more fully the goals and reactions of policy

Analytical factors

8 The extent to which the central bank uses various indicators of inflation expectations
9 The extent to which the central bank uses models and forecasts
10 The importance of analysis of money and the banking system to the choice of the monetary framework.

From the survey results we compiled a score between zero and a hundred per cent for each of the 10 categories, based on the weighted sum of responses to individual questions according to the criteria shown in appendix tables A.1 to A.6. The survey responses provided a store of facts and many of these statistics can be drawn from the numbers in the right-hand side of each table. These columns illustrate the distribution of answers in all economies, and in each of industrialised, transitional and developing economies.

Macroeconomic policy-makers have evolved their frameworks by fusing successful strategies from different types of frameworks, and the key advantage of such a broadly-based survey is that it allows us to consider the potential for a marginal contribution of any particular framework characteristic irrespective of the state of others.

Section 5: The Use of Explicit Targets: Practical Experiences in 93 Economies in the 1990s

Following the breakdown of the Bretton Woods international monetary system, policy-makers have employed a variety of monetary frameworks to increase the credibility of monetary policy[16]. The key characteristic of the framework is often an explicit target for monetary policy, and this section assesses the use of such targets in a range of economies in the 1990s. The analysis is based on data provided by the 93[17] central banks that responded to the Bank of England questionnaire.

Explicit monetary policy targets have become more widely used in the 1990s than at any time since the Bretton Woods era. In the survey[18] of 93 central banks, 95% (all but five economies) were using some form of explicit target or monitoring range in 1998[19]. The past three decades have seen marked swings in choices of explicit targets and monitoring ranges[20] (See Chart 3.2). Appendix A-7 provides detailed information about the periods in which exchange rate, money, and inflation targets were adopted, used, and dropped in all 93 economies in the sample and for every year in the 1990s.

Chart 5.1

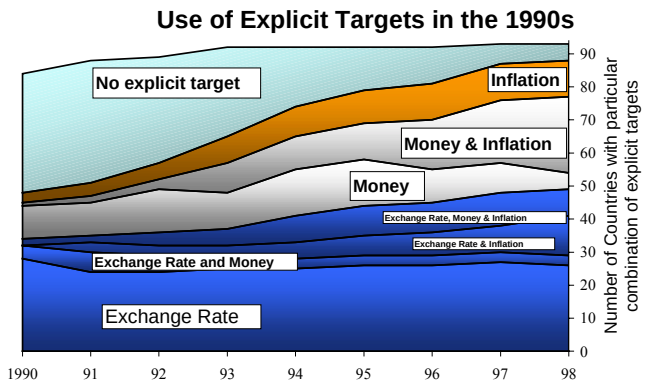
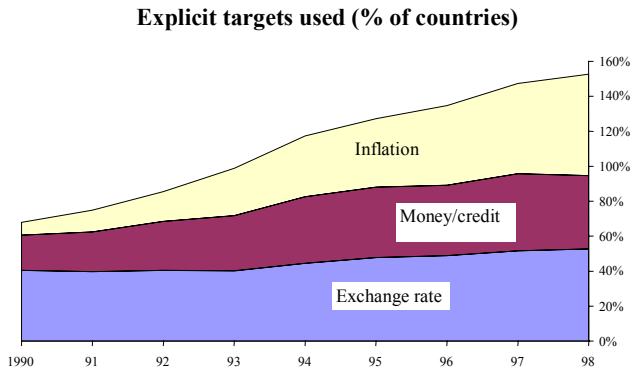


Chart 5.2



The data indicates three particular trends:

- *Many countries in the sample use more than one explicit target*. In 1998, nearly half the economies in the sample announced an explicit target (or monitoring range) for more than one of the exchange rate, growth in money or credit, and inflation, compared with only 8% in 1980. In 1998, each country published an average of 1.5 targets for these variables.

- *Explicit targets have become much more widespread in the 1990s than in the previous two decades*. The use of explicit targets—for the exchange rate, money, or inflation—grew in the 1990s. Their use is now more widespread than at any time since Bretton Woods. Between 1990 and 1998, the percentage of economies with explicit exchange-rate targets increased from 37% to 54%. The percentage of countries with an explicit money target

[16] See Cottarelli and Giannini (1997) for a detailed assessment of the experience since Bretton Woods.
[17] The ECB also completed the survey in 1999, after other central banks. But the information used here related to the period before 1999.
[18] The survey aimed to include variety of countries. However, some sample selection bias may remain. For example, small open developing economies that target the exchange rate are under represented.
[19] The exceptions are Botswana, Japan, Sri Lanka, and Thailand, but not the United States. In 1998 the Federal Reserve still published a monitoring range for broad money growth.
[20] In the remainder of the chapter we refer to 'targets' rather than 'targets and monitoring ranges'. Nevertheless, we acknowledge that some countries, including the United States, have stated that monitoring ranges have limited importance in terms of guiding monetary policy.

increased from 17% to 43%. The number of countries with inflation targets increased over tenfold, from 5% to 58% of the sample[21]. Of the 54 countries that had inflation targets in 1998, 11 (12% of all countries) had an inflation target only; while of the six countries that had explicit inflation targets in 1990, only one (New Zealand) described it as the centrepiece of its monetary framework.

- *In the 1990s (up to 1998), there were 114 examples of an economy announcing a new explicit target for any of the exchange rate, money and inflation, while only 19 economies dropped an explicit target.* In other words, more new targets were adopted than there are economies in the sample. Seven countries dropped money targets (or monitoring ranges) during the period: Portugal and Turkey (1992); Spain (1994); Macedonia (1995); Czech Republic, Poland, and the United Kingdom (1997). Generally, this represented an acknowledgement that money growth was not at the top of the central bank's hierarchy of indicators. There were no cases of a country dropping its explicit inflation target in the 1990s[22], with the exception of countries joining the European single currency.

Section 6 Targets and Policy reactions: rules and discretion in the use of explicit targets

The debate about rules versus discretion in monetary policy can be traced back several decades[23]. The arguments are well summarised by Guitian (1994). He describes how, under a successful rules-based policy, 'the predictability of policy should help offset the unpredictability of the environment'. In contrast, a successful discretionary approach involves using 'policy adaptability as a means of keeping an uncertain environment under control'. The following section provides evidence from international experience in the use of money and inflation targets in an attempt to determine the extent to which targets are followed rigidly.

6.1 Inflation and money target misses

Policy-makers may sometimes regard it as acceptable to miss their target eg. after a shock.[24] Such a choice could occur either because of shifts in preferences or because of shocks. In the analysis that follows, a larger miss is associated with a relatively flexible approach to policy targeting. An important caveat, however, is that even when policy attempts to adhere rigidly to targets, transmission lags may imply that policy is unable to restore a variable to its targeted path within a given period. The data used here cannot distinguish between these two possibilities[25].

Charts 6.1 and 6.2 show the average performance relative to target and the distribution of misses for broad money growth and inflation targets[26]. The number of observations varies

[21] There are governments that publish forecasts for inflation in their annual budget that may or may not represent an explicit target for monetary policy. We regard them as explicit targets of monetary policy only if a central bank responded that there was an explicit inflation target.

[22] Some countries that joined the European single currency may have dropped formal targets for domestic inflation in 1999.

[23] Simons (1948) stresses the policy benefits of stable money rules, which are also promoted by Friedman (1960).

[24] Debelle (1999) argues that the flexibility built into the design of inflation targets implies shields inflation targeting from criticism of inflation targets that they ignore output and employment.

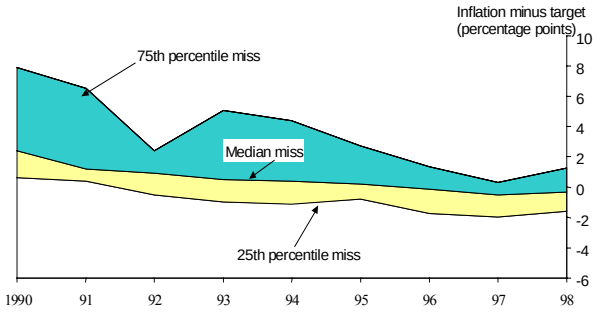
[25] And in the future we intend to do further work on looking at reasons for misses, persistence in target misses

[26] Data are responses to the Bank of England questionnaire. We tried to make data consistent by asking for information about when the target was set in the year prior to which the target referred. Target revisions during the course of the year were excluded, even when such data were provided. Where there is a target range, we use the average as the reference point. Where the target is specified as a ceiling, we treat the ceiling as the reference point.

from year to year, as do the median target levels (see Table 6.2). For both money and inflation targets, the number of observations is particularly small in 1990–92, we focus on the results between 1993 and 1998, when there are between 23 and 53 observations in each year. In each year of the 1990s the charts show the median miss, plus the value of the miss for the country at the 25th and 75th percentile of the distribution. Thus the shaded area encloses the outcomes for the half of the sample with the smallest misses above and below the target ('accurate' observations). The analysis focuses on the median rather than the mean, because the distribution is skewed by a very small number of wide target misses.

Chart 6.1

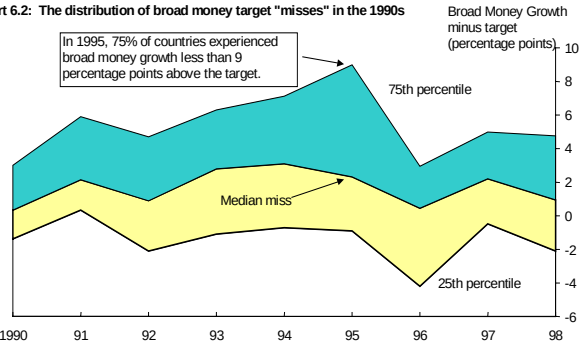
Chart 6.1: The distribution of inflation Target "misses" in the 1990s



Note: Money targets include all targets for different definitions of money and credit period
Source: Bank of England survey of monetary frameworks, Cottarelli and Giannini (1997) and IFS (various issues)

Chart 6.2

Chart 6.2: The distribution of broad money target "misses" in the 1990s



Note: See Table 3.2 for the number of observations in each year.
Source: Bank of England survey of monetary frameworks

Table 6.1: Number of observations of inflation misses in Charts 6.1 and 6.2

	Inflation target		Money target	
	Number of observations [a]	Median target	Number of observations [a] [b]	Median target
1990	7	3.5	14	9.2
1991	11	5	16	10.8
1992	14	9	19	10.5
1993	23	10	23	12.0
1994	30	8	27	12.5
1995	37	8	29	13.2
1996	44	7	30	14.8
1997	50	7.3	33	15.0
1998	53	6.5	26	11.6

(a) Some outcomes for 1998 were not available from central banks. Where possible these outcomes have been estimated using IMF data.
(b) These are predominantly targets for broad money. Narrower measures were only included only when no broad money target was used.
Source: Bank of England survey of monetary frameworks

The data raise several questions:

- *To what extent does the increased use of explicit targets indicate a more rigid approach to monetary policy?*

For inflation targets between 1993 and 1998, the average width of the range of target misses between the 25th and 75th percentile is 3.9 percentage points (see Chart 6.1). Chart 6.2 illustrates country experience with broad money growth targets. Between 1993 and 1998, the average width

of the range enclosed by the 25th percentile miss and the 75th percentile miss is 7.3 percentage points. These data suggest that broad money targets have not been treated as rigid rules.

The cross-sectional evidence presented here is complementary to the time series evidence that assesses the likelihood of adhering to particular inflation outcomes. The time series evidence from the 1980s and earlier suggests a humbling degree of inaccuracy in central banks' capacity to meet targets. Haldane and Salmon (1995) estimate a model for inflation in a particular country (the United Kingdom) and observe errors based on historical experience[27]. They find that, on the basis of UK data between 1960 and 1994, in some of their simulations there is 'only a 50% probability of adhering to a target range of 6 percentage points'. As a result, Haldane (1995) suggests that the central bank faces a trade-off between 'credibility and humility'[28]. In practice the relatively strong forecasting performance in practice implies that the model-based results overstate such a trade-off.

Table 6.2: Summary of misses from inflation and broad money targets in countries that announced explicit targets in the 1990s

Table 6.2.A: Summary of misses from inflation targets

Total number of annual observations = 269. Total number of countries = 56

		Low target observation		High target observation	
Percentile	All	0-25	25-50	50-75	75-100
Range of Targets (percentage points)		Less than 3.5	3.5 – 7.2	7.2 - 13.5	Above 13.5
Median miss	0	-0.4	0	0.3	1.3
Median absolute miss	1.5	0.7	1.0	2.2	6.7

Table 6.2.B: Summary of misses from money targets

Total number of annual observations =217. Total number of countries = 37

Percentile	All	0-25	25-50	50-75	75-100
Range of Targets (percentage points)		less than 6.5	6.5- 12.3	12.3 – 17.0	Above 17.0
Median miss	1.8	0.3	1.8	2.7	3.5
Median absolute miss	3.1	1.8	3.0	3.0	6.5

Table 6.2.C: Comparison of misses from inflation and money targets in economies where both were announced in the same year

Total number of annual observations =143. Total number of countries = 31

Observations for:	All observations		Low target observations[(a)]		High target observations[(a)]	
	inflation	money	inflation	money	inflation	money
Median absolute miss	1.5	3.2	0.8	2.3	4.4	6.2

[(a)] The 'high' and 'low' groups were divided according to the magnitude of the sum of the inflation and money target in that year.

Source: Bank of England survey of monetary framework

The cross-sectional evidence from the survey suggests that, in the 1990s, outcomes have been considerably better in meeting both inflation *and* money targets than model-based analysis of earlier experience suggested[29]. Nevertheless, the results from Table 6.2.A show that the median absolute miss in the 1990s was 1.5 percentage point i.e. there was approximately a 50% success rate in adhering to an inflation-target range of ±1.5 percentage points in the 1990s[30]. For countries setting an inflation target of less than 3.5%, there has been around a 50% probability of adhering to a much narrower range of ±0.7 percentage points. For money targets and outcomes, Table 6.2.B suggests greater accuracy than that predicted by models based on time-series data. For

[27] Haldane and Salmon use a small macro model, add to it a policy rule, and then solve the system by feeding in a set of shocks calibrated from the historically estimated residuals. They control for policy-induced volatility. Their results are in line with time-series results for other countries estimated at the same time.
[28] Haldane (1995), page 203.
[29] Though the cross-sectional analysis used here has the disadvantage of being unable to explain such good performance.
[30] This is the median absolute miss for the entire sample—shown in the first column of Tables 3.3.A.

explicit money targets, there was approximately a 50% success rate in achieving an outcome within 3.1 percentage points of the target.

Why do the time-series and cross-country evidence differ? One possibility is that judgement combined with models markedly improves the accuracy of policy. Another is that, whereas the time series results are based on estimates over several decades, the results from the Bank of England survey refer only to the 1990s, when there may have been fewer exogenous (non policy induced) shocks that induced inflation volatility. This explanation is consistent with the view that the 1990s provided a relatively shock-free environment conducive to building credibility through the use of explicit targets[31]. It may also be that sustained low inflation has reduced the likelihood of shrinks recurring.

- *Are the results suggestive of bias—i.e. do outcomes tend to overshoot or undershoot the target on average?*

To the extent that unexpected shocks even out over the sample period, the results suggest that policymakers have, on average, been realistic in setting inflation targets. Chart 6.1 suggests that since 1994 inflation outcomes have not been obviously biased in either direction relative to target. In the years since 1993, the median miss has been within +0.5% to -0.5%. And in the sample as a whole, the median miss is zero (see Table 6.2.A). In contrast, money growth has tended to overshoot the target. Part of the explanation may be that central banks have consistently underestimated falls in velocity. Chart 6.2 provides evidence that money targets have been overshot more often than undershot. Table 6.2.B shows that the median money target miss for the entire sample was +1.8 percentage points.

- *To what extent do the results depend upon the rate of inflation when the targets are being set?*

The sample contains examples of targets announced when inflation is low, and examples of explicit targets announced as part of a policy plan to reduce inflation from high rates. High inflation that occurs because of adverse shocks or because there are pressing policy objectives other than low inflation is likely to make it harder to achieve monetary targets. Table 6.2.A contains the median misses from explicit inflation targets in the 1990s for all observations. It also divides the sample into four groups, according to the size of the target. One quarter of observations represent countries targeting a rate of inflation of under 3.5%; half are below 7.2%; and three quarters are below 13.5%. Table 6.2.B provides analogous information, based on the experience of explicit targets for money growth. The data used in each section of the table are set out in two rows. The first relates to the median miss, which may be greater or less than zero depending upon whether targets are relatively more likely to be overshot or undershot. The second gives the median absolute misses, irrespective of whether the outcome was above or below the target.

Each section of Table 6.2 shows that misses are higher when the targets are higher, both for inflation and for money growth. Overall, the table shows that misses remain roughly in proportion to the level of the target. There are more than 67 observations spread over the entire sample length for annual inflation targets of less than 3.5%. They illustrate that the median miss is -0.4 percentage points (the minus sign indicating that low-inflation countries have undershot the target more often than overshooting it)[32]. Low-inflation countries have established a track record of accuracy in hitting targets, with little evidence of systematic over or undershooting. For countries

[31] It is less clear how the proliferation of explicit targets has helped to create such a shock-free environment.
[32] Some of these targets are ceilings, so a marginal undershoot may not be indicative of systematic target undershooting.

with higher targets, Table 6.2.C confirms that misses have been larger and outcomes are more likely to be above target.

Money-growth targets exhibit a similar pattern of misses, increasing in magnitude for higher-target observations. The size of the absolute miss is not as clearly related to the size of the target as is the case for inflation. This is because several economies, such as Taiwan, have had considerable success in anticipating shifts in velocity and meeting money targets, even when the targets are set at relatively high growth rates.

The final question raised by the data is:

- *Are monetary and inflation targets implemented with equal or differing degrees of flexibility?*

Table 6.2.C provides information on countries that had explicit inflation and money-growth targets in the same year. This makes it possible to compare the flexibility with which inflation and money targets are implemented in countries that announce both. An important caveat is that the misses not only could be attributable to greater flexibility in policy, but also could arise because of the differing impact of demand, supply, and velocity shocks on money and inflation targets. If policy is not able to restore the variable to target within the period because of relatively long transmission lags, then even attempts to adhere rigidly to targets may not succeed in eliminating target misses.

The results show that inflation misses were less than half of those for money targets. The median inflation target miss (in absolute terms) for countries that announce both inflation and money targets is 1.5 percentage points, compared with 3.2 percentage points for broad money growth. The results are consistent with the view that over a broad range of countries, the mix of shocks leads to greater deviations from money targets than inflation targets. In particular, velocity shocks may have led to relatively larger deviations from money targets. The results may also reflect the priority that policy-makers give to inflation targets over money targets, in the event of a conflict between them.

The results also illustrate that, in practice, it is difficult to assert that inflation targets imply any more or less discretion than do money targets. It might be thought that inflation targets are more discretionary in the short term. Cottarelli and Giannini (1997) note that money targeting is 'characterised by the announcement of a short-term intermediate target, either in the form of a monetary aggregate or of a (typically crawling) peg[33]. Policy instruments typically affect money aggregates sooner than inflation, and hence policy-makers wishing to adhere to money targets may have to act sooner and with less discretion[34]. Yet money target outcomes have deviated from target by more than inflation outcomes, indicating that money targets are either harder to hit or are interpreted more flexibly. This would support the view that policy may be set pragmatically irrespective of the published target.

6.2 Inflation targets and policy reaction functions: a survey-based approach.

[33] This argument about the nature of the implementation of intermediate money targets does not necessarily conflict with the view that inflation is purely a monetary phenomenon in the long term.

[34] Although if inflation targeting implies rigid adherence to an inflation forecast, it may limit the scope for discretion even when policy does not attempt to hit the current inflation rate. Goodhart (this volume) assesses how targeting future inflation may still leave scope for discretion in policy decision.

The survey responses provide new evidence with which to assess how central banks around the world direct policy towards their objectives. In particular, the survey sheds light on the capacity of monetary frameworks such as money and inflation targeting to distinguish adequately among frameworks, and examines the extent to which exchange-rate strategies are being pushed towards more extreme choices of freely floating or rigidly fixed exchange-rate arrangements.

6.2.i Policy focus and framework labels

It is convenient to attach labels to frameworks such as 'inflation targeting', 'money-targeting' and 'exchange rate targeting'. In practice only a small minority of economies treat their targets as rigid rules – and nearly all of these are exchange-rate targeters – so a label cannot in reality predict how policy will react to a given shock. In the short run, almost all central banks may, in response to certain shocks, treat domestic targets flexibly. In the long run, by contrast, almost all central banks are likely to aim for monetary stability, as defined by their legal objectives.

Rather than categorise economies into lists of labelled frameworks, this study attempts to capture the degree to which policy focuses on a particular variable by asking four questions relating to each type of target. These are combined to form a single score - between zero and 100 - for each economy for each variable. The scoring system, described in detail in Appendix 1, is based upon (i) whether a target is announced, (ii) whether the central bank defines its framework in terms of targeting a particular variable, (iii) how the central bank ranks policy priorities in practice; and (iv) which variables prevail in policy conflicts. The scores are shown in the Appendix, Tables A.1 to A.3. The scores give an indication of the degree to which policy focuses on its principal objective, and of how far policy may be diverted toward other objectives.

The tables in Appendix 1 give a fuller picture of what governs short, and medium-term policy focus (the legal mandate of central banks to achieve price stability is often interpreted as a long-term objective). For the great majority of countries, the indices show that policy is sometimes diverted from its prime focus. The measures of policy focus suggest that only 10% of frameworks in the sample have a policy that focuses completely on only one of the exchange rate, money or inflation. In the other 90%, the responses show evidence of discretion. For example, money targeters may rank inflation as important in setting the target, while inflation targeters may pay close attention to the exchange rate. Prospects for domestic inflation may affect decisions about exchange rate pegs.

Some of the potential pitfalls of a 'labels' approach are illustrated in Table 6.3 which compares the categorisation of regimes according to (i) the variable for which a numerical target is published and (ii) self-classification by policy-makers. In terms of how central banks in the sample classify their frameworks, column D shows that just under a third of respondents do not classify their framework as targeting one variable in particular. Of those that do classify their regimes as targeting one particular variable, exchange rate targeting is the most popular self-classification (28% of the sample), followed by money-targeting (24%) and inflation-targeting (16%).

There is by no means a one-to-one correspondence between such self-classifications and the variables for which policy targets are announced. Thus some of the pitfalls of a labelling approach illustrated in the table include:

- *Not all targets are announced*: Table 6.3 illustrates that 7% of economies do not publish targets or reference values for the variable they classify themselves as targeting.

- *Fourteen per cent of countries publish a target for only one variable, but do not classify themselves as targeting that variable* (see Table 6.3).

- *Central banks that publish both inflation and money targets, but not exchange-rate targets, do not classify their frameworks uniformly*. Of these 25 economies, 14 classify themselves as money-targeting and 3 as inflation-targeting, and 8 choose not to classify themselves according to a single label (See row 5 of the Table 6.3).

- *It is not possible to distinguish between money, and inflation-targeting frameworks by observing which countries publish inflation targets, because virtually all countries that classify themselves as money targeters also publish inflation targets, guidelines or reference values for inflation (column B).* These include the central banks of Germany (up to 1998) and Switzerland, which clearly state their medium-term inflation preferences, even though they do not describe them as inflation targets (see Posen 2000). It is not surprising that so many money-targeting central banks announce inflation targets. To establish a money target, countries need to work back from an inflation and growth target or forecast. If the inflation projections are being missed yet money targets are on track-for example because of a velocity shock - there is no intrinsic reason why the intermediate target should take precedence over such inflation and output projections (See the evidence above).

- *Differences between money and inflation targeting do not necessarily reflect differences in a central bank's reaction function.* Although 24% of respondents classified their regime as money-targeting (Table 6.3), only 1% reported that money always prevailed over inflation and exchange-rate objectives in the event of policy conflicts. The survey results indicate that in the event of velocity shocks, both money and inflation targeters are likely to focus on inflation objectives.

- *There are around four times as many central banks with explicit inflation targets as there are central banks that categorise themselves as "inflation targeting"*. 60% of economies announce inflation targets and 33% rank the variable as the main objective of policy, yet only 13% classify themselves as 'inflation targeting'.

So in practice there is a continuum of more-or-less overlapping possibilities from inflation and money targets through to exchange rate targets. Many frameworks have some of the characteristics of each, suggesting the need for a broader approach to assessing the extent to which the various objectives of monetary policy are, in the short and medium term, better described as complementary or as alternatives.

The increasing tendency of policy-makers in money-targeting economies to announce such inflation projections as targets or reference values may have contributed to making policy preferences more transparent in these economies. In the 1990s a growing number of countries with IMF programmes have announced inflation objectives reflecting their increasing importance in Fund-supported programmes. This represents a change in emphasis from practices in the 1980s, when Fund-supported programmes gave relatively more prominence to the role of money and credit targets in adjustment programmes[35].

[35] See Cottarelli and Giannini (1998).

Table 6.3 Matrix showing central bankers' self-classifications of their monetary frameworks[1] and also the targets they publish

Targets published shown in rows 1 to 7.	Self-classification shown in columns A. to D.											
	Total of 94 frameworks	A. Framework classified as exchange rate targeting		B. Framework classified as money-targeting			C. Framework classified as inflation-targeting		D. Cannot be summarised as such			
	(% of total)	28		24			16		32			
1.	Explicit target only for "framework" variable	Argentina Austria Bahrain Barbados Belgium Bosnia Herz. Bulgaria Denmark E. Caribbean Estonia	Hong Kong Hungary Iceland Ireland Latvia Lithuania Namibia Netherlands Norway Portugal	Germany South Africa[3] Switzerland			Australia Canada Czech Rep. Israel Mexico New Zealand Sweden UK					
2.	Explicit target for one variable other than "framework" variable (explicit target in brackets)			Cyprus (exchange rate) Egypt (inflation) Peru (inflation)			Botswana (exchange rate)		Bahamas (exch.) Belize (exch.) Fiji (exch.) Kuwait (exch.) Tonga (exch.) USA (money) Croatia (inflation) Ecuador (inflation) S. Leone (infl.)			
3.	Explicit target for exchange rate and money	Malta							Jordan			
4.	Explicit target only for exchange rate and inflation	Lebanon Macedonia Uruguay					Chile[3] Poland		Finland Malaysia Spain West Afr. States			
5.	Explicit target only for money and inflation			China Guyana Indonesia Kazakhstan Kenya Korea Mauritius	Moldova Nigeria Russia Romania Slovenia Tanzania Zambia		Albania Armenia Jamaica		Georgia India Kyrgyz Mozambique Slovakia Turkey Turkmenistan Uganda			
6.	Explicit targets for exchange rate, money and inflation	Greece		Bangladesh Taiwan			Mongolia		France Italy Ukraine Vietnam			
7.	No explicit target	Singapore		Ghana					Japan Sri Lanka Thailand ECB			

[1] Respondents were asked 'If you were to categorise your framework as one of the following, would you describe it as: (1) money targeting, (2) inflation targeting (3) discretionary, (4) exchange rate targeting, (5) balance of payments targeting, (6) other (please specify), (7) cannot be summarised as one of above, (8) none of the above.

[2] This column includes various classifications, such as 'discretionary' and combinations of the other categories. The first box includes all countries that announce explicit targets for only one variable.

[3] Known changes since the survey was completed include: Chile has dropped its exchange-rate band, South Africa has announced it will implement inflation targets

The analysis supports the views of several authors who, when assessing the international context of monetary frameworks, have reinforced the message of compromise between explicit targets and flexibility. In summarising the debate between rules and discretion, Guitian reminds us that 'there is an exception to every rule'. Similarly Bernanke, Laubach, Mishkin, and Posen (1999) describe inflation targets as 'a framework not a rule' and 'constrained discretion'[36]. Responses to the FJMRS survey also illustrate the flexibility in money targeting. Indian policy-makers describe their framework as 'money targeting with feedback', and the Swiss respondent described their framework as 'money targeting with an escape clause'. Such a description of money-targeting appears to apply almost universally. Only one of the 25 central banks that described their framework as money-targeting reported that money objectives always prevailed over objectives for inflation and the exchange rate.

7 Inflation targets, independence, accountability and transparency

Whichever variable is targeted, it appears as though central banks use their targets flexibly. But how does this flexibility affect the debate as to the choice between money and inflation targets, and how does it affect the relationship with other framework characteristics? Based on scoring methods described in detail in the Appendix, the cross-country cross-correlation matrix of monetary policy framework characteristics shown in Table 7.1 summarises the broad relationships among the categories measured in the survey. The table covers the 93 economies in the sample.[37] Some of the results from this table are referred to in more detail in sections below.

An important starting point is that the simultaneous use of money and inflation targets appears to indicate that many countries have adapted or rejected the literature that regard targets as alternatives. The literature has also framed the choice of explicit target for monetary policy in terms of the controllability of a particular variable and the stability of the relationship between that variable and the final objective[38]. Yet while the premise on which such literature is based appears well grounded, it is hard to explain some countries' choice of targets using such a framework. Why do so many liberalising countries with unstable velocity use money targets? Why do other countries that have poor data and are vulnerable to supply shocks use explicit inflation targets?[39] Are 'explicit targets' in some cases better described as benchmarks, whose contribution lie in assisting the planning of fiscal and monetary policy, measuring outcomes and assessing deviations?

[36] See Guitian (1994), page 36, and Bernanke, Laubach, Mishkin, and Posen (1999), pages 293 and 299.
[37] The ECB response, which was circulated after the others in 1999, is excluded to avoid double-counting.

[38] See, for example, Cukierman (1995).
[39] See Gerlach (1999)

Table 7.1: Correlations between measures of framework characteristics in 93 monetary frameworks

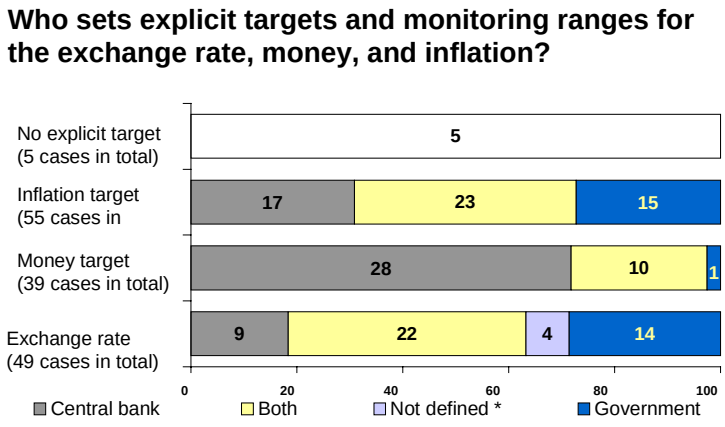
	Exchange rate	Money	Inflation	Discretion	Independence	Accountability	Explanations	Inflation expectations	Models and forecasts
A. Exchange-rate focus	**1.00**	**-0.54**	**-0.68**	**-0.46**	**-0.09**	**0.03**	**-0.26**	**-0.29**	**-0.07**
B. Money focus	-0.54	**1.00**	**0.07**	**0.41**	**-0.05**	**-0.08**	**-0.12**	**-0.06**	**-0.14**
C. Inflation focus	-0.68	0.07	**1.00**	**0.18**	**0.15**	**0.09**	**0.30**	**0.43**	**0.15**
D. Discretion* (high score implies more discretion)	-0.46	0.41	0.18	**1.00**	**-0.09**	**-0.25**	**-0.10**	**0.06**	**-0.18**
E. Independence	-0.09	-0.05	0.15	-0.09	**1.00**	**0.06**	**0.42**	**0.32**	**0.47**
F. Accountability of central bank to government	0.03	-0.08	0.09	-0.25	0.06	**1.00**	**0.14**	**0.21**	**0.11**
G. Policy explanations	-0.26	-0.12	0.30	-0.10	0.42	0.14	**1.00**	**0.47**	**0.50**
H. Analysis of inflation expectations	-0.29	-0.06	0.43	0.06	0.32	0.21	0.47	**1.00**	**0.49**
I. Analysis using models and forecasts	-0.07	-0.14	0.15	-0.18	0.47	0.11	0.50	0.49	**1.00**
memo:									
Inflation (average 1997 and 1998, includes estimates)	0.04	0.00	-0.01	0.00	-0.16	0.09	-0.17	-0.02	-0.08
Inflation rank (1 = lowest inflation rate in the sample)	-0.30	0.31	0.23	0.18	-0.09	0.04	-0.23	-0.12	-0.19

7.1 The role of targets in defining a relationship with government

One of the most important contributions of inflation targets may be in terms of providing both government and the central bank with a clearly defined stake in the monetary strategy (see the discussion in section 3 above). In this section we verify this by assessing global trends as to who sets each of money and inflation targets and how this is related to the nature of perceived central bank independence.

The global experience offers a variety of approaches to setting targets, ranging from demarcation of responsibilities to drawing together institutions to formulate targets. Chart 7.1 represents the responses of 93 central banks when asked whether they or the government set the explicit target in 1998, or whether the target was set jointly.

Chart 7.1



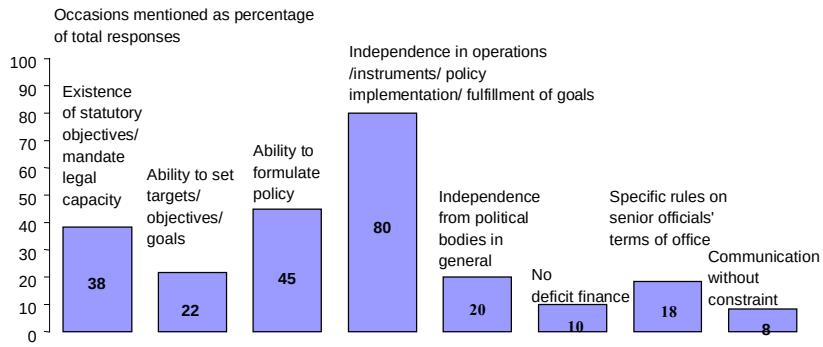
A key difference in the roles of money and inflation targets lies in their influence on the accountability and independence of central banks. The survey results enable us to extend the

previous empirical literature that focuses on formal "goal" independence of central banks enshrined in statutes, since it also provides information on "target" independence. i.e. who in practice sets each one of the targets used by survey countries.

The target-setting arrangements for money and inflation targets are strikingly different. Central banks have a comparative advantage in researching monetary and banking developments that may cause changes in velocity. They, after all, play a pivotal role in the banking system and produce monetary data. It is natural therefore that central banks use money targets to monitor performance. Yet a central bank's comparative advantage in understanding monetary developments may be detrimental to the capacity of money to provide a vehicle for engaging government in setting policy strategy, and in influencing expectations of the public. As argued by King (2000)[40], "It is easier, I think, to explain if you can relate the decisions to something that is visible and comprehensible, and an inflation target has that great advantage." Chart 7.1 confirms the various arrangements for setting inflation targets are set is far more evenly distributed than for money targets.

To shed further light on target setting, accountability and independence we use those survey responses that yield direct information about central banks' independence. The results showed that central banks regard independence as the most important aspect of their monetary framework, and Chart 7.1 summarises responses to the direct question, 'How would you define central bank independence?' We translated the general responses into the categories shown in the chart, which is ordered with categories representing goal independence on the left, instrument independence in the centre, and other aspects that may affect policy setting on the right-hand side. We used 60 responses[(41)] with each country represented in at least one and, as it turned out, at most seven categories. It is evident from the data underlying the chart that most responses reflect each country's own experience, and it is under this premise that we interpret the responses.

Chart 7.2.
How central bankers define independence [1]



[1] The responses are the authors' categorisation of answers to the question "How would you define central bank independence?" There were 60 usable responses (23 from industrialised economies and 37 from developing and transitional economies). Respondent cited an average of 2.9 categories in industrialised economies and 2.2 in developin and transitional economies.

The literature on independence has focused on goal independence being represented by the clarity with which statutory objectives focus on price stability (see, for example, Cukierman (1992)). Extensive recent academic literature, prompted in part by Walsh (1995), has stressed the difference between goal and instrument independence. Almost all central banks considered instrument independence to be an important aspect of independence (See Chart 7.2). In practice

[40] In Mahadeva and Sterne (2000), p183
[41] Some central banks in our questionnaire did not complete this question; others' answers were excluded because they referred explicitly only to the independence of their own central bank.

the effectiveness of formal arrangements providing central banks with instrument independence may, however, be undermined by a number of factors that are represented by bars towards the right-hand side of the graph.

By contrast, goal independence tends to be important to central banks only in particular circumstances that are closely related to the target-setting capacity discussed above. Chart 7.2 shows that in their identification of the defining factors of independence only 22% of respondents mentioned the ability to set targets, objectives or goals, while 38% defined independence by stressing the importance of legal objectives. The relative importance of these two measures of goal independence depends, as usual, upon circumstances.

The 38% of respondents who defined independence by relating it to the central bank's statutory objectives[42] generally fall into two categories. First, they are central banks whose mandate and statutory objectives have been revised in recent years, suggesting that governments and central banks are more likely to focus upon legal objectives when these objectives are fresh and pertinent. Money and exchange rate targeting countries are also more likely to define independence according to statutory objectives. Clear statutory objectives coupled with numerical money targets set by the central bank and instrument independence has helped progress towards price stability in a number of countries, including Germany, Slovenia and Switzerland.

In contrast, central banks focusing their framework on inflation targets rarely defined independence with reference to statutory objectives. For these countries, the target-setting arrangements are apparently much more of a live issue than in the case of money targets. In a contractual approach to monetary policy, the government may set a target and provide the central bank with operational independence to pursue the target. Perspectives on important ingredients of independence split the inflation target users into two groups, whose views on independence differ according to whether or not they are close to stable inflation.

Of the countries which describe themselves as 'inflation-targeting', only Israel and the United Kingdom have adopted a framework in which the government alone sets the target. Government sets the inflation target in 13 other cases although none of them were described by the central bank as 'inflation-targeting frameworks'. The responses from inflation-targeting central banks reflect how the relationship between government and central bank is strongly influenced by whether or not inflation is already acceptably low. Central banks in inflation-targeting countries with low inflation did not generally regard the ability to set the target as important in assessing their own independence. This suggests that when inflation is low, there is little scope for disagreement about what the target should be. Indeed, three inflation-targeting central banks in low-inflation economies stated explicitly that independence could be defined in terms of the central bank's capacity to meet a *mutually* agreed target. Such responses may reflect how successfully the responsibility for monetary policy has been shared between government and the central bank. The arrangements may not only allow government to control the long-run direction of policy, but they can also help to remove any incentive for the government to create surprise inflation (Goodhart 2000). If government attempts to boost output in the short run by increasing the inflation target, the blatant opportunism of such an act is likely to remove the surprise from 'surprise inflation'. This in turn may reduce any output effects and make such a policy ineffective.

This degree of comfort with target-setting arrangements in Canada, New Zealand and the UK, contrasts starkly with that expressed by those using inflation targets on a disinflation path. The responsibility to set inflation targets may be of heightened importance during disinflation. A

[42]Typical responses included "The extent to which the central bank can act effectively to fulfil its statutory objectives without political interference" and "The ability of the central bank to pursue statutory objectives without undue influence from other government officials or private parties."

number of respondents in such countries defined independence according to the capacity to set their own targets or objectives. This is illustrated vividly by one such respondent who posed the rhetorical question, What good is instrument independence if the Parliament or Cabinet sets politically motivated goals that are binding?

When inflation is high, it has proved to be harder for government and the central bank to split responsibilities for inflation targeting and instruments. Some countries, for example, have important objectives for financial stability or balance of payments, as well as inflation targets. And for countries that are undertaking disinflation, there are often at least two inflation targets: one for the current period and one for the long run. A sixth of all countries specify distinct short- and long-run targets when announcing inflation targets, including Chile, Croatia, the Czech Republic, Israel, Jamaica and Poland.

In the context of Walsh-type models, (see Walsh (1995), multi-year contracts may be difficult to define because, in the presence of a high degree of shocks, the temptation may be to revise the contract *ex post*, thus negating the contract's benefits. What should happen, for example, if inflation falls below the annual target, but remains above the long-run target for inflation (as happened in 1998 in the Czech Republic, Israel, Poland, and, to a lesser extent, Chile)? Hrnčíř and Šmídková (2000) (for the Czech Republic), Landerretche, Morande, and Schmidt-Hebbel (2000) (for Chile), and Bufman and Leiderman (2000) (for Israel) show how each of these economies have approached this issue. The optimal response to inflation falling between a short and long-run target may depend upon the source of the shock that caused the inflation target to be missed, and in some circumstances an option might be to permit inflation to fall below its short-run target, so that it can reach its long-run target quicker.[43]

In high-inflation countries this policy dilemma highlights the difficulties in specifying narrow central bank objectives that provide the basis for an accountable contract between the central bank and government. In such cases the difference between setting targets and instruments becomes blurred. It is considerably more difficult for the government to specify in advance a transparent contract when there is a possibility that short-term and long-term targets might point policy in different directions. Specifying targets for disinflation as ceilings rather than as points or ranges may help to resolve the problem, since an outcome for inflation below the short-term ceiling but above the long-term goal does not imply any conflict between the short- and long-term targets. The distance between a short-term inflation ceiling and a long-term target of close to zero may, however, be so large as to undermine the clarity of the target.

Where contracts become complicated, an alternative approach may be for the government and the central bank to agree on an explicit target, in order to emphasise joint ownership of the monetary strategy. In 23 cases out of 55 (42% of central banks with explicit inflation targets), the government and the central bank jointly set the inflation target. These include seven central banks where the framework is described as inflation-targeting (Armenia, Australia, Canada, Jamaica, Mexico, Mongolia, and New Zealand). The comments in section 3 of Donald Brash and Gordon Theissen, illustrate that joint responsibility for the monetary strategy has been important in improving monetary and fiscal coordination in New Zealand and Canada.

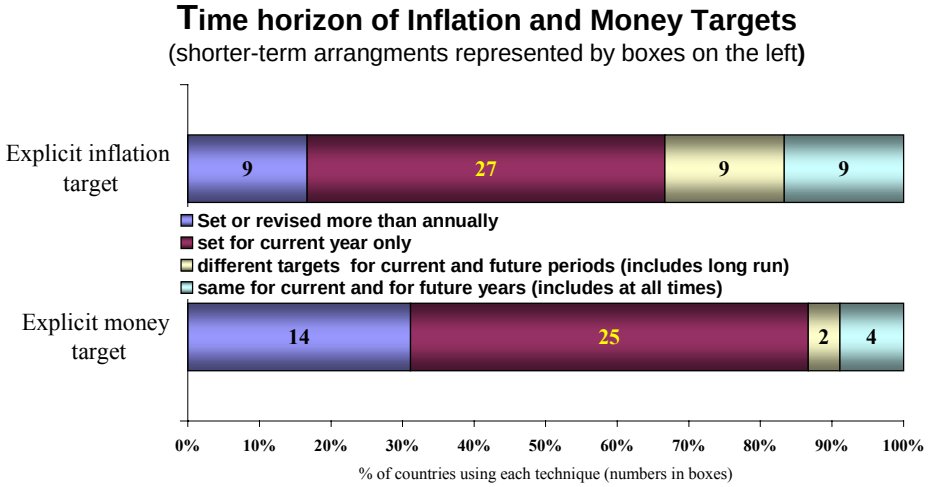
[43] This is often termed 'opportunistic disinflation', a term used by Blinder (1994).

7.2 Inflation targets and policy explanation

Targets have the potential to communicate both long-term preferences and the desired adjustment path in the face of economic shocks. Yet in practice, targets do not usually fulfil both roles. Globally, the most common occurrence in setting either money or inflation targets is for the central bank or ministry of finance to announce, once a year, a single number for the forthcoming year (Chart 7.3). Yet this does not always square with the desire to use targets both to anchor long-term expectations and to steer expectations through what may be a during the bumpy ride towards price stability. Nor is an annual process necessarily consistent with the transmission lags of monetary policy, which appear to vary greatly from country to country (Chart 7.4). The use of targets alone may therefore open a 'transparency gap' that can be filled using other instruments of communication. In this section we assess the extent of such transparency gaps in different countries, the means by which they have done so, and also evidence on the effect of increased provision of information on inflation performance.

When inflation is low and relatively stable, governments or central banks may enjoy the luxury of setting targets that do not change much over time. In these countries, a target of say '2% inflation at all times' represents an attempt to anchor long-run expectations even when a shock to the economy temporarily diverts a variable from its long-term path. Chart 3.6 illustrates that only 17% of inflation targets (including those of Australia, Canada, Finland, Sweden and the UK) and 9% of money growth targets (including those of France and Switzerland) set the same target number year after year. Such targets may provide information about long-term preferences rather than a planned adjustment path. In the event of shocks moving inflation or money away from target, the long transmission lags imply that the target by itself is insufficient to provide an indication of how quickly policy will restore inflation or money towards the target. Additional instruments of communication, such as forecasts, are frequently used to fill this transparency gap[44].

Chart 7.3



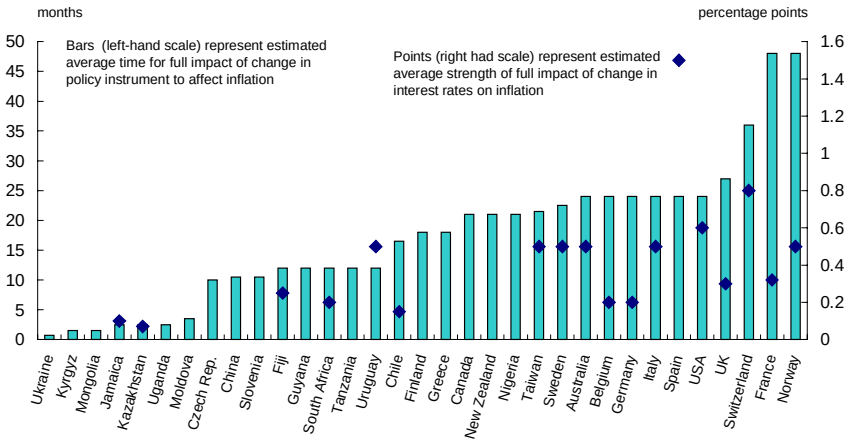
Note: Numbers of frameworks in the boxes, percentage of each target set according to a particular time horizon measured on the axis. The shorter-term arrangments represented by boxes on the left.
Source: Bank of England survey of monetary frameworks

Two thirds of inflation targets and 87% of money targets are set or revised at least annually and are not specified for more than one year ahead (Chart 7.3). In determining the nature of

[44] Goodhart (2000) provides a vivid description of remaining sources of ambiguity, including the relative benefits of targeting the mean, median, or mode of inflation forecasts.

any potential transparency gap left open by targets in these economies, it helps to consider roughly how long it takes for policy instruments to impact on the target variable. There is enormous diversity in the perceived transmission lags across the different economies. Chart 7.4 represents the relationship between changes in the operating instrument (e.g. interest rates), the operating target (e.g. base money), and the final objective (e.g. inflation). Specifically, Chart 7.4 indicates respondents' estimates for: (i) the time taken to impact fully on inflation and (ii) the full impact upon inflation.

Chart 7.4: Estimated average length and strength of transmission



Source: Bank of England survey of Monetary Frameworks

The bars in Chart 7.4 represent the average transmission length; the points illustrate the average strength of the relationship. The results provide a loose but illuminating means of cross-country comparison. A strong caveat is that although the results represent central bank views about the transmission mechanism in their economies, although no attempts are made to ensure consistency across countries, either in terms of the model used or the approach to the experiment[45]. Differences may reflect several factors, including (i) structural differences between economies, (ii) differences in framework[46], and (iii) differences in estimation and simulation procedures. Furthermore, not all respondents reported the strength of the effect on inflation of changes in instruments. And in order to allow comparability across countries, we report only results for those that specified the strength in terms of a relationship between a short-term interest rate and inflation. Nevertheless, the chart illustrates that the perceived average length of time taken for instruments to affect inflation ranges from 1 to 50 months in different economies.

The wide dispersion of lags in transmission mechanisms contrasts sharply with the relative homogeneity of the frequencies and time horizons over which targets are set. Thus targets communicate different aspects of short-run and long-run policy intentions in the various economies. It is not, however, possible to specify targets in such a way that they specify precise guidance of how policy should react to shocks and the time horizon over which price stability should be restored. Thus target specification leaves open different forms of 'transparency gaps', which are described below.

[45] For example, we did not specify for how long instruments were to be changed in the policy simulation.

[46] The exchange-rate channel tends to be fast in many economies: if the exchange rate is fixed, the transmission mechanism may be longer.

First, when transmission lags are longer than the target-horizon, then there is limited capacity for policy to bring inflation back on track within the target horizon. In this case a transparency gap may be filled by regular publication of a forecast that can indicate expected progress in bringing inflation back to target. When transmission lags are much shorter than the target horizon, the transparency gap is of a different nature. In this case the target may not in itself provide a reason for instruments to be changed immediately to achieve the target. In an extreme example of a disinflating economy, where the transmission length is just, say, one month, then to achieve a given inflation target in a year's time, policy changes could in principle be delayed for eleven months and policy tightened sharply in the last month of the target year.[47] Thus, as in this example the target specification leaves a transparency gap in the sense that the target may not provide a guide as to exactly when policy should be changed. And if in this example inflation starts off well above price stability, then the target is likely to be revised in a year's time. Then there is a "two-way" transparency gap, as the target does not bind policy in either the very short or long run.

Such transparency gaps might be closed by publishing multi-period targets that set out a convergence path for inflation (see Hrncir and Smidkova (2000), and by publishing short- and long-term forecasts (with the long run target below the short-run one). A sixth of all countries specify distinct short- and long-run targets when announcing inflation targets, including Chile, Croatia, the Czech Republic, Israel, Jamaica and Poland. Yet a potential difficulty of this approach is that responsibilities for setting targets and instruments becomes blurred (see previous section).

Several recent papers have highlighted the importance of forward-looking policy in minimising instabilities arising from any mismatch between transmission mechanism length and the time horizon of targets. For the United Kingdom, see Batini and Haldane (1999), and for a similar approach in the Czech Republic, see Mahadeva and Šmídková (2000). The papers seek to address how far forward policy should look, and what the costs are for looking too far forward, or not far enough. They use small macro-econometric models and observe what happens to output and inflation volatility in response to shocks, when policy tries to bring inflation back to target relatively quickly or relatively slowly. Mahadeva and Šmídková's results for the Czech Republic illustrate that in order to minimise the volatility in output and inflation, it is optimal for policy to react to forecasts for inflation between three and five quarters ahead in the Czech Republic[48] rather than the longer reaction time in the United Kingdom.

The literature on transparency is small but growing[49], and it examines the effect of a central bank revealing its objectives and its knowledge of shocks, thereby reducing informational asymmetries between the central bank and public. The motivation for providing such information to the public is similar in spirit in many central banks is to fast-track the process of acquiring credibility, an example of which is provided by King (2000):

> [When we left the exchange rate mechanism] we wanted to acquire credibility and you cannot do that easily without a track record. But you can do something on the way to developing a track record. We felt that by being transparent- by explaining not only what the target was but also how we thought about the economy-we could actually acquire some credibility. So

[47] Such a possibility would be much more likely where target inflation was defined as the month-to-month change in the price index, rather than the 12-month change

[48] The differences may reflect differing strengths of particular shocks, different forms of nominal and real rigidities, and the relative importance of the various transmission channels. In the Czech Republic the exchange-rate channel is particularly important.

[49] Chortareas, Stavasage and Sterne (2000) contains a review of the recent theoretical literature on transparency

> if we were doing things privately, we should say what we were doing. Our motto became 'do as you say and say as you do, and that guided the construction of our framework with an inflation target and a high degree of transparency
>
> [Mervyn King (1999, Central Bank Governor's Symposium)][50]

In Faust and Svensson (2000) increased transparency makes the intentions of the central bank observable, so the central bank sacrifices more credibility should it choose to pursue its undeclared employment objectives rather than its explicitly stated inflation objectives. Increased transparency generally reduces average inflation in their model, as it does in the case of Jensen (2000). He focuses on the effect of a central bank revealing its preferences, which disciplines central bank actions, increases its credibility, and reduces inflation. Jensen points out an important proviso to this conclusion, however, which is that when central bank preferences are already fully known, transparency does not increase credibility nor reduce inflation, but does have a cost in terms of handicapping the central bank's capacity to influence the economy and pursue output stabilisation.

The theoretical literature suggests that transparency should lead to lower inflation by increasing credibility but provides provisos to the result, particularly that the effect is reduced or eliminated when the credibility is already high. In practice, the great majority of central banks are unlikely to have reached the stage where they perceive their credibility to be so strong that the costs of transparency in terms of reduced capacity to stabilise output outweigh the benefits in terms of improved credibility. In the 91 economies described analysed in section 2, for example, median inflation was above 8.5% as recently as 1990. Most countries remain on a disinflationary path or have only achieved low, stable inflation relatively recently. Where reluctance to pursue transparency exists, it is likely to stem from nervousness about exposing the central bank's kitchen to external scrutiny, particularly if forecasting capacity is week and if relationships with government less than fully clear.

Chortareas, Stasavage and Sterne (2000) provide empirical evidence using data from the FJMRS survey to provide the first cross-sectional empirical evidence that transparency in terms of publishing central bank forecasts is strongly associated with low inflation.[51] The effect across the 81 countries is very strong and robust to different specifications. They find that in the case of a country with a floating exchange rate which began with an inflation rate of 20% per annum "a decision by the central bank to begin publishing regular inflation forecast accompanied by forward-looking analysis in regular bulletins is estimated to result in a reduction in inflation to only 8% per annum. The authors acknowledge that their results may be so strong because transparency could be proxying for other variables, such as the part of independence that is unobserved in standard survey responses, or the strength of analysis in the central bank. Nevertheless, the results tend to support the view of Posen (2000), whose analysis suggests the Bundesbank's success in maintaining low inflation comes partly through its thorough explanations of its policy decisions, leading him to the conclusion that "when it comes to transparency, more is more."

The results of Chortareas, Stasavage and Sterne contradict the view that transparency should be a pre-requisite for the introduction of an inflation (or vice versa) target. They find no significant evidence that the effect of increased transparency in reducing inflation is stronger for those countries that target inflation compared with those that target money. Uncertainties about objectives and shocks exist in both frameworks, particularly for those countries on disinflation paths. The results are therefore consistent with the view that explaining objectives and policy reactions is just as important in either framework.

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[50] In Mahadeva and Sterne (2000)

[51] The authors define transparency in forecasting according to a Guttman scale, using data on the frequency of the forecast, its format, whether past forecast errors are discussed in bulletins, and if risks to the forecasts are discussed.

7.3 The relationship between measures of analysis conducted and inflation targets

The success of a monetary framework that retains any degree of exchange-rate flexibility depends upon the analysis that supports it. The questionnaire therefore asked about the analysis of three separate issues. The first is the extent to which central banks monitor and use various measures of inflation expectations (financial markets, surveys, and outside forecasts). The second relates to the extent to which different methods are used to forecast economic variables (e.g., off-model forecasts, VARs, structural models and theoretical models). Third, we asked central banks about the importance of money-demand equations and other means of analysing the role of the financial sector in the transmission mechanism.

A summary of the results are shown in detail in Appendix Tables A.1 to A.6, and the extent to which these characteristics are correlated with other aspects of monetary frameworks is shown in rows I to K of Table 7.1. Some of the correlations in the table are as expected: the more important inflation objectives are, the greater the score for analysis of inflation expectations. The more important money objectives are, the greater the importance attached to analysis of money demand and the banking system.

Yet the use of models and forecasts is not significantly related to the choice of monetary framework. Knowledge of how policy actions affect the economy is always useful, irrespective of the policy target. Model based forecasts tend to indicate much greater uncertainty in inflation and money outcomes than is actually the case (section 6.1), indicating that the purpose of modelling must be merely to forecast. Table 7.1 provides a strong indication that such a purpose is related to transparency. The correlation between analysis using models and policy explanations is very strong, consistent with the view that models are used more to help understand the transmission mechanism rather than to provide a sharp increase in forecast accuracy and it is easier for central banks to explain why outcomes are deviating from target when they have access to analysis that makes them confident in their explanations.

The survey sought to measure the extent to which central banks focused on particular areas of analysis by asking about their research on particular subjects. The questionnaire set out a list of subjects and asked each respondent if their central bank had (i) published research in that area, (ii) considered it in detail; (iii) considered it, or (iv) not considered that subject much. The results, summarised in Table 5.4, illustrate some marked differences between industrialised economies and the other group of developing and transitional economies.[52] Two of the main difference are as follows:

- The average industrialised-economy central bank had published[53] work in 59% of the categories identified in the table in the past five years, compared with 26% in developing and transitional economies. The difference is likely to be attributable both to a higher concentration of research resources in industrialised economies and to significantly more and better data on which to use them. While industrialised economies have researched across the broad range of subjects, analysis in developing and transitional economies has focused on some core areas of the

[52] Central banks show much greater variation in research focus when categorised by economy type than by type of framework. This in part reflects the breadth of the research categories. Several central banks have published in almost all of these areas, irrespective of their framework.

[53] In this case 'published' could be interpreted in a broad sense, including central bank working papers and bulletins, and also external publications by central bank staff.

economy, including money, banking, the balance of payments,[54] the exchange rate, and fiscal policy. The data in Table 5.4 shows that at least 50% of respondents in developing and transitional economies reported that these areas had been at least considered in detail.

- There appear to be large gaps in the analysis of the real sector in developing and transitional economies. For example, only 8% of respondent banks had published research on labour markets and there had been similarly little analysis of consumption and investment. In large part this reflects lack of data. For example, the September 1999 edition of the IMF's *International Financial Statistics* included no recent quarterly data[55] at all for any item in the National Accounts for 80% of the developing and transitional economies included inthe FJRMS study, compared with only 15% of the industrialised economies.

[54] The balance of payments is the only category in which greater proportions of developing and transitional economies have published research relative to industrialised economies.
[55] For any of the previous four quarters.

Table 5. 4: Focus of research in central banks

To what extent have researchers in each central bank considered the following issues in the last five years?	% published						Overall ranking in priorities		
	1. Published	2. Considered in detail	3. Considered	4. No or not much considered	industrialised and developing transitional		All countries	Industrialised	Developing and transitional
% of Total	**36**	**22**	**25**	**17**	**59**	**26**			
Monetary policy framework	59	24	10	7	93	44	**1**	1	2
Behaviour of banks	43	30	24	2	59	37	**2**	7	3
Balance of payments (incl. cap. flows)	46	28	20	7	41	48	**3**	14	1
Analysis of financial instruments	44	29	18	9	67	35	**4**	2	6
Money-demand equation	49	17	24	10	74	38	**5**	4	7
Exchange rate and regime	40	29	24	7	52	35	**6**	10	4
Financial fragility issues	39	28	29	4	52	33	**7**	11	4
Fiscal sector	32	28	28	12	41	29	**8**	13	8
Transmission mechanism	39	17	30	14	63	29	**8**	6	9
Modelling and econometrics	37	22	23	18	70	22	**10**	2	10
Price specification	30	17	34	19	59	17	**11**	8	11
Commodity prices and terms of trade	24	19	33	23	48	14	**12**	16	12
Investment and corporate sector	23	19	30	28	48	13	**13**	14	13
Consumption and personal sector	23	16	30	31	56	10	**14**	12	14
Philips curve and output gap	24	18	16	42	67	6	**15**	4	16
Labour market	24	9	31	36	63	8	**16**	9	15

Notes: The precise categories are provided in Question An.4 of the questionnaire, reproduced in Appendix A.2.
The rankings are based on a weighted sum average score of the three columns given by:
Priority of research topic = (number of countries in column 1) * 3 + (column 2) * 2 + (column 3) * 1.
The overall rankings are strongly influenced by the results for developing and transitional economies because there was considerably more variance across categories in their analytical focus. In industrialised economies, for example, there was no category had been at least considered in detail by more than 70% of economies.

These results may help to explain why so many developing economies categorise themselves as money-targeting rather than inflation-targeting. Inflation-targeting central banks generally forecast inflation by assessing the impact of real disequilibria in domestic- goods markets (through the output gap) and labour markets (through the NAIRU).[56] These assessments are made using analysis that is often supported by a variety of theoretical and econometric models (See Chapter 4.3.v above). For example, all the industrialised economies that classify themselves as inflation-targeting have published research on the Phillips curve and the output gap,[57] whereas only 6% of developing and transitional economies reported having published such research. And finally, the inflation reports of central banks from economies such as the Czech Republic, Hungary, Israel, Poland, Sweden, and the United Kingdom[58] all give prominence to assessing the relative strength of demand and supply.

Thus the weight placed on analysing the various aspects of the transmission mechanism differs sharply across economies. In a developing economy with limited data on the real economy and much more frequent and reliable data for the exchange rate and money supply, these latter variables are more likely to remain permanently close to the top of the hierarchy of indicators, even if neither is targeted directly. In such circumstances, it makes sense to use annual data for real and nominal output to derive quarterly or monthly forecasts and targets for variables such as money. This approach may be appropriate whether or not the central bank (or IMF) takes a "monetarist" view of the economy.

8 Conclusions

Macroeconomic policy-makers have evolved their frameworks by fusing successful strategies from different types of frameworks. A pioneer of the strategy to anchor expectations though targets and communication was the Bundesbank, and more recently other inflation-targeting countries have taken on the mantle. Similarly, the US Federal Reserve was a pioneer of forward-looking policy, yet forecasts have become increasingly important in inflation-targeting countries and elsewhere. And inflation targets themselves are now used far more widely than in the small group of industrialised economies that first made them the centrepiece of their monetary frameworks: of the 94 central banks in the FJMRS study that existed in 1998, well over half used inflation targets. And while much of the literature attempts to identify the circumstances under which policy-makers should choose either inflation or money targets, a final striking example of framework fusion is that one of the most popular target combinations is to declare numerical targets for both money and inflation.

The increasingly widespread use of explicit targets over the past decade reflects the progress of the debate between rules and discretion. Explicit targets can be used to demonstrate that a particular variable ranks high on the hierarchy of indicators, even if it is acceptable to miss the 'target'. Throughout the world, monetary policy objectives in the 1990s have become increasingly focused on more precisely defined objectives that are consistent with central banks' statutory objectives of price and monetary stability. From the wealth of experience evident in the responses to the questionnaire, it is clear that explicit targets are being used more than at any time since Bretton Woods, and the publication of targets for domestic aggregates has never been more widespread. This represents a marked convergence in the approach to policy.

[56] See, for example, Bank of England (1999), Economic Models at the Bank of England, page 32.
[57] The central banks reporting such published research are the inflation-targeting (or former inflation-targeting) countries of Australia, Canada, Chile, Finland, Mexico, New Zealand, Spain, Sweden, and the UK, plus the following economies that do not classify themselves as inflation targeting: Belgium, Ghana, Greece, Iceland, Ireland, Italy, Japan, Korea, Norway, Peru, Portugal, Switzerland, and the USA.
[58] Other central banks publish very similar documents with titles other than 'Inflation Report'.

Greater use of explicit inflation targets may be a natural move for many central banks in countries that have chosen not to target the exchange rate. Central banks, after all, have relatively abundant access to data and analytical techniques with which to analyse the monetary sector, but it is generally inflation that is the most visible vehicle available for guiding private-sector expectations and communication with government.

The greater use of explicit targets does appear to be part of a broader move to build credibility through transparency. In the long run, credibility is built primarily by actions and achievements. But a strong message from the survey is that defining objectives more narrowly, and making an effort to explain the outcome of targeted variables more clearly, can be an important contribution to central bank credibility and policy.

As the medium-term incentives to deliver price stability become better established, it becomes easier to respond flexibly to short-run shocks without undermining credibility. An early reservation about inflation targeting was that relatively benign conditions in the industrialised economies up to the mid-1990s meant that the framework remained fairly untested by severe recessions and supply shocks. But the experiences of countries such as New Zealand, Chile, the Czech Republic, and Israel and the UK, along with those of many other developing and transitional economies using inflation targets, show that the value of targets may lie in providing a medium-term focal point on which macroeconomic policy-makers can co-ordinate and commit. There is little evidence that such a contribution of inflation targets has been severely undermined even in the face of adverse shocks to the economy leading to target misses.

The possibility that explicit targets can be implemented flexibly undermines the view that strict prerequisites need to be in place before targets are adopted. Countries with unstable velocity have found intermediate money targets to be useful, just as countries with supply shocks and no detailed macro-econometric model have found inflation targets to be useful. FJMRS argue that 'it is better to have narrow objectives and be obliged to explain misses rather than having imprecise objectives that make success or failure difficult to measure'. Adoption of explicit domestic targets, then, provides momentum for a heightened role for explanation in monetary strategy and an important role for the now-thriving cottage industry of research that assesses optimal target specification, policy rules, and monetary conditions. Whichever target is adopted, it is highly unlikely that the optimal strategy will always be to maintain policy exactly on target. And a target miss coupled with a convincing explanation for the miss is unlikely to significantly undermine credibility.

Thus, while the labels of inflation targeting, money targeting, and exchange-rate targeting are a convenient means by which to distinguish broad differences among framework types, the evidence presented here suggests that in a global context frameworks are better thought of in terms of a wide array of underlying characteristics. It is, after all, the use of flexible strategies adapted to improve credibility in particular economic and political circumstances that have contributed to reducing inflation to historically low levels at the end of the 1990s.

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Appendix 1: Survey Questions and distribution of scores

Table A.1 Measure of policy focus on exchange-rate objectives

Questions		Question weight	Scores	Categories of answers, distribution of results	**All economies**	Industrialised	Transitional	Developing
1.	If you were to categorise your framework as one of the following, which would it be?	1	100	mentioned exchange rate only	**26**	11	7	8
			50	not categorised as one target but mentioned exchange rate targeting with one other objective	**6**	2	1	3
			33	Not categorised as exchange rate targeting but mentioned in the context of two other objectives	**3**	1	1	1
			0	did not mention exchange rate	**59**	14	13	32
2.	To what extent is the exchange rate fixed to another currency?	1	100	explicit point target, or described by IMF as "fixed to another currency"	**18**	1	6	11
			75	explicit band narrower than 6%, or described by IMF as "limited flexibility"	**13**	3	1	9
			50	explicit band of 30% or less	**15**	11	2	2
			25	no explicit target (but public knowledge that target exists), or IMF described as managed floating	**21**	3	10	8
			0	freely floating	**27**	10	3	14
3.	Please rank monetary policy objectives (other than price or monetary stability) the central bank pursues (1 = first priority), indicate if there is no fixed target.	1	100	exchange rate first objective	**33**	13	7	13
			50	exchange rate mentioned as an objective	**35**	5	11	19
			0	otherwise	**26**	10	4	12
4.	In your current monetary framework, is there scope for other variables to prevail over the target in the event of policy conflicts	1	100	exchange rate always prevails over *all other objectives*	**17**	6	5	6
			75	exchange rate always prevails over *money and inflation* objectives	**6**	1	1	4
			50	exchange rate usually prevails	**12**	8	1	3
			25	exchange rate sometimes prevails	**38**	6	10	22
			0	exchange rate rarely or never prevails	**21**	7	5	9

Table A.2 Measure of policy focus on money objectives

Questions		Question weight	Scores	Categories of answers, distribution of results	**All economies**	Industrialised	Transitional	Developing
1.	If you were to categorise your framework as **one** of the following, which would it be?	1	100	money targeting	**23**	4	5	14
			50	could not categorise as one target but mentioned money targeting with one other objective	**6**	1	1	4
			33	Mentioned in context of two other objectives	**2**	1	1	0
			0	Otherwise	**63**	22	15	26
2.	Do you have a specific, numerical, publicly announced target or monitoring range for money or credit?	1	100	Yes	**39**	8	12	19
			0	No	**55**	20	10	25
3.	Please rank monetary policy objectives (other than price or monetary stability) the central bank pursues (1 = first priority). Indicate if there is no fixed target.	1	100	money first objective	**14**	2	5	7
			50	money mentioned as an objective	**26**	5	7	14
			0	otherwise	**54**	21	10	23
4.	In your current monetary framework, is there scope for other variables to prevail over the target in the event of policy conflicts? If so, how often does money prevail as a target?	1	100	money always prevails over *all other objectives*	**0**	0	0	0
			75	money always prevails over *the exchange rate and inflation* objectives	**1**	0	0	1
			50	money usually prevails	**19**	3	4	12
			25	money sometimes prevails	**21**	3	5	13
			0	money rarely or never prevails	**53**	22	13	18

Table A.3 Measure of policy focus on inflation objectives

Questions		Question weight	Scores	Categories of answers, distribution of results	**All economies**	Industrialised	Transitional	Developing
1.	If you were to categorise your framework as one of the following, which would it be?	1	100	inflation targeting	**15**	6	4	5
			50	could not categorise but mentioned inflation in the context of one other objective	**8**	3	3	2
			33	mentioned inflation in the context of two other objectives	**3**	1	1	1
			0	Otherwise	**68**	18	14	36
2.	Do you have a specific, numerical, publicly announced target or monitoring range for inflation or credit?	1			**55**	13	16	26
			100	Yes				
			0	No	**39**	15	6	18
3.	Please rank monetary policy objectives (other than price or monetary stability) the central bank pursues (1 = first priority). Indicate if there is no fixed target.	1	100	Inflation first objective	**30**	8	8	14
			50	Inflation mentioned as an objective	**33**	11	6	16
			0	Otherwise	**31**	9	8	14
4.	In your current monetary framework, is there scope for other variables to prevail over the target in the event of policy conflicts? If so, how often does inflation prevail as a target?	1	100	Inflation always prevails over *all other objectives*	**4**	3	1	0
			75	Inflation always prevails over *the exchange rate and inflation* objectives	**6**	2	3	1
			50	Inflation usually prevails	**10**	4	3	3
			25	inflation sometimes prevails	**40**	12	6	22
			0	inflation rarely or never prevails	**34**	5	9	18

Table A.4: Measures of central bank independence

Questions		Question weight	Scores	Categories of answers, distribution of results	**All economies**	Industrialised	Transitional	Developing
1.	To what extent do statutory objectives provide the central bank with a clear focus on price stability?	1	100	only goal is price, monetary or currency stability	**24**	9	9	6
			75	price stability + financial stability objectives and non-conflicting monetary stability objectives	**54**	13	13	28
			50	Price stability plus conflicting objectives	**12**	4	0	8
			25	no statutory objectives	**3**	1	0	2
			0	only goals other than price stability	**1**	1	0	0
2.	To what extent does the central bank determine the setting of policy targets?	1	100	only central bank sets an explicit target for, either inflation, money or the exchange rate) OR there are no explicit targets	**27**	7	6	14
			50	both central bank and government have a role in setting an explicit target (for either inflation, money or the exchange rate)	**55**	17	14	24
			0	only government sets a target (for either inflation, money and the exchange rate)	**12**	4	2	6
3.	To what extent does the central bank determine the adjustment of monetary policy instruments?	2	100	central bank decides on changes in instruments and no representative of government attends the meeting of monetary policy makers, other than as an observer	**63**	23	18	22
			65	central bank decides on changes to instruments and a representative of government attends the meeting of monetary policy makers	**15**	3	3	9
			33	central bank and government have a role in setting instruments	**12**	2	0	10
			0	central bank role in setting instruments is limited	**4**	0	1	3
4.	To what extent are there limits on central bank financing of the fiscal deficit?	2	100	prohibited, never used, or amounts so small and for short periods independence in no way affected	**46**	26	11	9
			75	narrow, well enforced limits exist	**15**	1	5	9
			50	limits exists that are usually enforced	**25**	1	4	20
			25	wide limits exist and some procedures exist when limits are missed	**7**	0	2	5
			0	no limits or little enforcement	**1**	0	0	1
5.	How long is the term of office of the Governor?	0.5	100	8 years or above	**5**	3	1	1
			86	7 years	**11**	5	6	0
			71	6 years	**21**	6	9	6
			57	5 years	**37**	9	4	24
			43	4 years	**6**	2	1	3
			29	3 years	**5**	1	0	4
			14	term can exceed 3 years	**9**	2	1	6
Memo: Can the Central Bank formulate and implement policy without government constraint? (Scores are authors' interpretation of general answer provided)		0	100	independent with no qualification	**36**	16	10	10
			75	independent with any qualification	**31**	10	6	15
			50	independent with significant qualification	**11**	1	4	6
			25	limited independence	**14**	1	2	11
			0	not possible, or requires sanction of other person/body	**2**	0	0	2

Table A.5 Accountability of the central bank to government

Questions	Question weight	Scores	Categories of answers, distribution of results	**All economies**	Industrialised	Transitional	Developing
Accountability to a specific target							
1. Is there a specific published target?	1	100	yes	**83**	25	22	36
		0	no	**11**	3	0	8
2. Does government have a role in setting any central bank target?	1	100	yes	**67**	21	16	30
		0	no	**27**	7	6	14
3. Do procedures exist for when the target is missed?	1	100	recognised formal procedures exist	**17**	8	4	5
		50	informal procedures exist, or if central bank reports instruments set in conjunction with government	**31**	5	6	20
		0	no	**46**	15	12	19
Accountability to Government or in general							
1. Central Bank subject to monitoring by legislature	3	100	yes	**70**	19	21	30
		50	irregularly, or if instrument independence limited	**6**	4	1	1
		0	no	**18**	5	0	13
Memo:	0	100	formally written down	**20**	6	2	12
Procedures written when government can overrule		50	informally	**3**	0	0	3
		0	no	**71**	22	20	29

Table A.6
Measure of policy explanations

Questions	Question weight	Scores	Categories of answers, distribution of results	**All economies**	Industrialised	Transitional	Developing
Explanation of Policy decisions (weights refer to sub-total - each has a weight of 1/3 in total score for policy explanations)							
1. Central bank provides explanations on day policy changed?	1.5	100	Yes	**76**	25	21	30
		0	No	**18**	3	1	14
2. Explanations provided when policy-makers meet and do *not* change policy	0.3	100	Yes	**15**	4	9	2
		50	Sometimes	**5**	2	1	2
		0	no	**74**	22	12	40
3. Policy decisions Discussed in standard bulletins and reports	2	100	at least twice a year	**61**	21	15	25
		50	at least annually	**12**	2	2	8
		0	no	**21**	5	5	11
4. Minutes of policy Mmetings published	1	100	within a month of meeting	**12**	7	2	3
		50	more than a month after	**5**	2	2	1
		0	no	**77**	19	18	40
5. Voting ptterns pblished	0.5	100	yes	**6**	5	1	0
		0	no	**88**	23	21	44
Published forward-looking analysis							
6. Forward-looking analysis in standard bulletins and reports	2	100	more than annually	**39**	18	7	14
		50	at least annually	**24**	4	4	16
		25	unspecified	**10**	2	4	4
		0	otherwise	**21**	4	7	10
7. Form of publication	1.5	100	words, one of numbers and graphs	**35**	16	5	14
		50	one of words, numbers and graphs	**25**	8	6	11
		25	unspecified	**13**	0	4	9
		0	none	**21**	4	7	10
8. Risks to forecast published	1	100	words and one of numbers and graphs	**9**	7	2	0
		50	one of words, numbers and graphs	**23**	9	4	10
		0	none	**62**	12	16	34
9. Discussion of past forecast errors	1	100	yes	**21**	8	3	10
		50	sometimes	**9**	7	2	0
		0	no	**64**	13	17	34
Assessment and Analysis							
10. Analysis in standard bulletins and reports	2	100	more than annually	**86**	28	20	38
		50	at least annually	**7**	0	2	5
		0	otherwise	**1**	0	0	1
11. Frequency of speeches	1.5	100	at least monthly	**39**	20	11	8
		66	at least quarterly	**26**	6	5	15
		33	less than quarterly/occasional	**29**	2	6	21
		0	never, almost never	**0**	0	0	0
12. Working papers and other research publications	1	100	more than 10 each year	**35**	18	5	12
		66	more than 5 each year	**19**	9	3	7
		33	more than 2/ occasional	**18**	1	8	9
		0	never	**22**	0	6	16

Table A.7: Explicit targets as at late 1998 (with dates they were adopted)

	Exchange Rate (50 economies from a total of 93)		Money (40 economies from a total of 93)		Inflation (54 economies from a total of 93)	
Developing	**22**		**18**		**25**	
	Cyprus (60s–)	E. Caribbean (83–)	India (85–)	Indonesia (93–)	Malaysia (70s–)	Mexico (94–)
	Fiji (60s -)	Hong Kong (83–)	South Africa (86–)	Bangladesh (94-)	Tanzania (80's–)	Peru (94–)
	Tonga (60s–)	Chile (86–)	Mozambique (87–)	China (94–)	Mozambique(87–)	Uruguay (95–)
	W. African Sts (60s–)	Argentina (91–)	Nigeria (87–)	Malta (94–)	Chile (91–)	Zambia (95–)
	Malta (71–)	Lebanon (93–)	Kenya (90?–)	Mauritius (94–)	Egypt (91–)	Jamaica (96–)
	Bahamas (73–)	Namibia (93–)	Guyana (90? –)	Vietnam (94–)	India (91–)	Mauritius (96–)
	Barbados (75–)	Ecuador (94–)	Ghana (92–)	Tanzania(95–)	Uganda (92–)	Sierra Leone (96)
	Jordan (75–)	Vietnam (94–)	Jordan (92–)	Zambia(95–)	Indonesia (92–)	W. Afr. States (97–)
	Bahrain(80–)	Uruguay (95–)	Uganda (92–)	Jamaica (96–)	Guyana (93–)	China (98–)
	Belize (80s–)	Malaysia (98–)			Nigeria (93–)	Kenya (98?)
	Kuwait (80s–)	Turkey (98–)			Vietnam (93–)	Lebanon (98–)
					Bangladesh (94)	Turkey (98–)
					Ecuador (94–)	
Transitional	**13**		**14**		**16**	
	Poland (90–)	Macedonia (96–)	Ukraine (91–)	Moldova (94–)	Poland (92–)	Georgia (96–)
	Estonia (92–)	Bosnia-Herz. (97–)	Macedonia (92–95)	Georgia (95–)	Albania (93–)	Kazakhstan(97–)
	Slovakia (93–)	Bulgaria (97–)	Mongolia (92–)	Kazakhstan (97–)	Macedonia (93–)	Kyrgyz (96–)
	Latvia (94–)	Turkmenistan (97–)	Albania (93–)	Romania (97–)	Russia (93–)	Mongolia (97–)
	Lithuania (94–)	Mongolia (98–)	Kyrgyz (93–)	Slovenia (97–)	Slovakia (93–)	Romania (97–)
	Hungary (95–)	Ukraine (98–)	Russia (93–)	Turkmenistan (97–)	Croatia (94–)	Slovenia (97–)
	Russia (95–)		Slovakia (93–)	Armenia (98–)	Armenia (95–)	Turkmenistan (97–)
					Moldova (96–)	Czech Rep. (98–)
Industrialised	**15**		**8**		**13**	
	Norway (60s–94-)	France (79–)	Greece (1950's–)	Korea (79–)	New Zealand (88–)	Finland (93–)
	Belgium (71–)	Austria (81–)	Germany (75–)	USA (late 70's–)	Greece (90? –)	Sweden (93–)
	Netherlands (71–)	Taiwan (85–)	Switzerland (75–)	Italy (84–)	Taiwan (90?–)	France (94–)
	Ireland (72–)	Israel (86–)	France (77–)	Taiwan (89–)	Canada (91–)	Italy (95–)
	Denmark (72–)	Spain (89–)			Israel (91-)	Spain (94–)
	Portugal (78–)	Iceland (89–)			UK (92–)	Korea (98–)
	Finland (78– 96–)	Greece (95–)			Australia (93–)	
	Italy (79–96–)					

Data from 92 responses to the Bank of England survey of Monetary Frameworks. A full list of the economies in the sample is given in Chapter 1. In 1998, the only economies inthe FJRMS sample that reported no explicit targets or monitoring ranges were Botswana, Japan, Singapore, Sri Lanka and Thailand. We defined Cyprus, Fiji, Norway, and Tonga as having explicit exchange rate targets as although no particular number is announced, the targets are either legal ones or they are sufficiently strong to be defined by the IMF as "fixed to another currency." In the case of exchange rate pegs, years in which devaluations took are included, as are years in which the currency targeted was changed. Germany and Switzerland have explicit long-term objectives for inflation but these are not included in the Table." A "?" is included for Greece and Taiwan because we are not sure if inflation targets were used before 1990.

Sources: Bank of England Survey of Monetary Frameworks and Cottarelli and Giannini (1997).