Geneva Reports on the World Economy Special Report 2

How Do Central Banks Write?

An Evaluation of Inflation Reports by Inflation Targeting Central Banks

Andrea Fracasso, Hans Genberg and Charles Wyplosz

NORGES BANK

ICMB INTERNATIONAL CENTER FOR MONETARY AND BANKING STUDIES

CEPR

HOW DO CENTRAL BANKS WRITE?

An Evaluation of Inflation Targeting Central Banks

Geneva Reports on the World Economy Special Report 2

International Center for Monetary and Banking Studies (ICMB)

International Center for Monetary and Banking Studies
11 A Avenue de la Paix
1202 Geneva
Switzerland

Tel +41 22 734 9548
Fax +41 22 733 3853
Website: www.icmb.ch

Centre for Economic Policy Research (CEPR)

Centre for Economic Policy Research
90-98 Goswell Road
London EC1V 7RR
UK

Tel: +44 (0)20 7878 2900
Fax: +44 (0)20 7878 2999
Email: cepr@cepr.org
Website: www.cepr.org

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 1 898128 76 6

HOW DO CENTRAL BANKS WRITE?
An Evaluation of Inflation Targeting Central Banks

Geneva Reports on the World Economy Special Report 2

Andrea Fracasso
Graduate Institute of International Studies, Geneva

Hans Genberg
Graduate Institute of International Studies, Geneva

Charles Wyplosz
Graduate Institute of International Studies, Geneva and CEPR

ICMB INTERNATIONAL CENTER FOR MONETARY AND BANKING STUDIES

CIMB CENTRE INTERNATIONAL D'ETUDES MONETAIRES ET BANCAIRES

NORGES BANK

International Center for Monetary and Banking Studies (ICMB)

The International Center for Monetary and Banking Studies was created in 1973 as an independent, non-profit foundation. It is associated with Geneva's Graduate Institute of International Studies. Its aim is to foster exchange of views between the financial sector, central banks and academics on issues of common interest. It is financed through grants from banks, financial institutions and central banks.

The Center sponsors international conferences, public lectures, original research and publications. It has earned a solid reputation in the Swiss and international banking community where it is known for its contribution to bridging the gap between theory and practice in the field of international banking and finance.

In association with CEPR, the Center launched a new series of *Geneva Reports on the World Economy* in 1999. The first report, 'An Independent and Accountable IMF', was published last September. It has attracted considerable interest among practitioners, policy-makers and scholars working on the reform of international financial architecture.

The ICMB is non-partisan and does not take any view on policy. Its publications, including the present report, reflect the opinions of the authors, not of ICMB or of any of its sponsoring institutions.

Centre for Economic Policy Research (CEPR)

The Centre for Economic Policy Research is a network of over 600 Research Fellows and Affiliates, based primarily in European universities. The Centre coordinates the research activities of its Fellows and Affiliates and communicates the results to the public and private sectors. CEPR is an entrepreneur, developing research initiatives with the producers, consumers and sponsors of research. Established in 1983, CEPR is a European economics research organization with uniquely wide-ranging scope and activities.

CEPR is a registered educational charity. Institutional (core) finance for the Centre is provided by major grants from the Economic and Social Research Council, under which an ESRC Resource Centre operates within CEPR; the Esmée Fairbairn Charitable Trust and the Bank of England. The Centre is also supported by the European Central Bank, the Bank for International Settlements, 22 national central banks and 45 companies. None of these organizations gives prior review to the Centre's publications, nor do they necessarily endorse the views expressed therein.

The Centre is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions. CEPR research may include views on policy, but the Executive Committee of the Centre does not give prior review to its publications, and the Centre takes no institutional policy positions. The opinions expressed in this report are those of the author and not those of the Centre for Economic Policy Research.

About the Authors

Andrea Fracasso is currently a postgraduate student at the Graduate Institute of International Studies in Geneva. Mr. Fracasso was previously educated at the University of Trento (*Laurea cum laude* - Italy) and at the University of York (MSc - UK). His main interests are in macroeconomics and central banking. A part of his *tesi di laurea* about the features of central banks in federal countries was published as a working paper at the Department of Economics at the University of Trento. He was Economic Policy's teaching assistant at the University of Trento in the years 1999/2000.

Hans Genberg is Professor of International Economics at the Graduate Institute of International Studies in Geneva, Switzerland. He is also Head of Executive Education at FAME (The International Center for Financial Asset Management and Engineering) in Geneva. A Swedish national, he holds a PhD in Economics from the University of Chicago. Professor Genberg's teaching and research deals primarily with international finance, monetary economics and macroeconomics. His publications have appeared in professional journals such as *Econometrica*, the *Journal of Monetary Economics*, the *Journal of International Economics*, the *Scandinavian Journal of Economics*, and the *IMF Staff Papers.*

Charles Wyplosz is Professor of International Economics at the Graduate Institute of International Studies in Geneva, Director of the International Center for Monetary and Banking Studies and Co-Director of CEPR's International Macroeconomics Programme. He currently serves on the French Prime Minister's Conseil d'Analyse Economique. He has written and edited several books on monetary and exchange rate policies and is the author (with Michael Burda) of a textbook, *Macroeconomics: A European Perspective.*

Contents

List of Tables *viii*
List of Figures *ix*
Author Acknowledgements *xi*
Foreword *xiii*
Preface *xv*
Executive Summary *xvii*

1. Introduction 1

2. The Communication Role of Inflation Reports in an Inflation Targeting Framework 7
   2.1 What needs to be commmunicated to whom? 7
   2.2 What form should communication take? 8
   2.3 Who communicates? Ownership of the Inflation Report 8
   2.4 Implications for Inflation Reports 9

3. Evaluating Inflation Reports 11
   3.1 Quality of information 11
   3.2 Clarity of assumptions 14
   3.3 Quantity of information provided 14
   3.4 Overall trade-off 14
   3.5 The decision process 19
   3.6 Inflation forecasts 19
   3.7 The executive summary 24
   3.8 Overall assessment 24
   3.9 Announcement of policy decisions 26

4. Monetary Policy Surprises and the Quality of Inflation Reports: an Empirical Evaluation 29
   4.1 The data 29
   4.2 Regression results: quality of the Inflation Reports 33
   4.3 Regression results: divergent perceptions of Inflation Reports 34
   4.4 Interpretation 37

5. Conclusions 39

Appendix A: List of Inflation Reports used for the evaluation *41*
Appendix B: Regression results with average inflation as a control variable *42*
Appendix C: Data *43*

Bibliography *45*

List of Tables

Table 1.1	Inflation Reports among inflation targeting central banks	2
Table 1.2	Main elements of inflation targeting practices	3
Table 3.1	Quality of information provided	12
Table 3.2	Clarity on assumptions made at time of decision	13
Table 3.3	Quantity of information provided	15
Table 3.4	How demanding is it to find information?	17
Table 3.5	Presentation of the policy-making process	18
Table 3.6	Inflation forecasts	20
Table 3.7	Presentation of the underpinnings of inflation forecasts	20
Table 3.8	Executive summaries: size and readability	21
Table 3.9	Quality of the executive summary	22
Table 3.10	Overall assessment	23
Table 3.11	Correlation of overall ratings	25
Table 3.12	Public announcement of policy decisions	27
Table 4.1	Changes in 3-month market interest rates at the time of monetary policy meetings	31
Table 4.2	Determinants of surprises in monetary policy: quality of the Inflation Report	35
Table 4.3	Determinants of surprises in monetary policy: divergent perceptions of Inflation Reports	36
Table B1	Determinants of surprises in monetary policy: robustness checks	42
Table C1	Interest Rate Data	43

List of Figures

Figure 3.1	Time to read the Inflation Report and quantity of information provided	16
Figure 3.2	Quality and quantity of information	16
Figure 3.3	Overall assessment	25
Figure 4.1	Interest-rate surprises at the time of monetary policy meetings	32
Figure 4.2	Adjusted interest rate surprises at the time of monetary policy meetings	32
Figure 4.3	Reduction in interest-rate surprises due to the quality of the IR	34
Figure 4.4	Average standard deviations of evaluators ratings	37

Author Acknowledgements

We are most grateful to Jan Qvigstad and the Central Bank of Norway (Norges Bank) for having invited us to explore this topic. In preparing this paper, we accumulated numerous debts. Amund Holmsen and the staff of Norges Bank provided data and advice, and organized informative meetings with academics, bankers and journalists. While preparing this report, further data and help with the interpretation of policy were generously provided by a number of present and former central bank officers: Adrian Armas, Erika Arrano, Charles Bean, Claes Berg, Gil Bufman, José De Gregorio, Lars Heikensten, Mervyn King, Leonardo Leiderman and Klaus Schmidt-Hebbel. Claes Berg of the Swedish Riksbank kindly organized valuable meetings with staff of the Riksbank, journalists and bankers in Stockholm. While revising our first draft, we invited all the central banks in the study to provide comments and corrections;* we are most grateful to acknowledge the assistance that most provided, but we bear full responsibility for any errors and misinterpretations that remain. The objective evaluation of this study was efficiently performed by Cinzia Alcidi, Coralia Gheorghe, Joana Queiroz and Virginia Di Nino. Aileen Gosselin-Lotz provided very able research assistance.

*Due to a clerical mistake, the Bank of Mexico was not consulted, an oversight for which we apologize.

Foreword

The annual series of Geneva Reports on the World Economy was launched by ICMB and CEPR in 1999. They have become a major reference for discussion of international financial and economic issues. This series is complemented now by the Geneva Special Reports, of which this is the second.

CEPR is pleased to publish this work, which fills an important empirical gap: the need for a systematic evaluation of the communication role of inflation reports issued by central banks around the world. This will be of great value to all those concerned with monetary policy, including the central banks themselves.

Richard Portes
President, CEPR

15 April 2003

Preface

Central banking is by nature a solitary business in all countries. To develop skills and avoid the pitfalls of excessive introversion, it is necessary for a central bank to benchmark its activities against those of other central banks in the international community.

New Zealand was the first country to adopt inflation targeting about 15 years ago. Many other countries have since followed suit. Today, the group counts more than 20 countries. Experience with this regime has accumulated over the past years. The advantage of being late in the race is that it is possible to catch up.

All inflation targeting countries produce inflation reports. But what is a good report? We all want to produce reports that are well written, provide an adequate and sufficient basis for monetary policy decisions and intelligibly explain the rationale behind the decisions to the general public. In order to draw on international experience, we thought it would be fruitful to seek a set of criteria based on best international practice. Inflation reports may of course serve somewhat different purposes in different countries. Nevertheless, comparing and classifying inflation reports from various countries should reveal the qualities of a first-class inflation report.

So who did we turn to? The International Center for Monetary and Banking Studies of the Graduate Institute of International Studies in Geneva (in cooperation with CEPR) produced the report *How do Central Banks Talk?* in 2001 (Blinder *et al.*). As a follow-up, we asked the Institute, in the persons of Andrea Fracasso, Hans Genberg and Charles Wyplosz, to establish a set of best practice criteria for inflation reports. The result is the report *How do Central Banks Write?*

Norges Bank has commissioned this report, but has of course had no influence on the results. The report would obviously be of higher quality if the work was focused on the academic environment and not on how Norges Bank fared with respect to the criteria. The report has certainly fulfilled the task and has once again led us to seek inspiration in the international community of central banks. Hopefully, Norges Bank will not be alone in benefiting from the experience and the assessment provided in this report.

I would like to thank Messrs Fracasso, Genberg and Wyplosz for excellent work.

Jan Fredrik Qvigstad
Chief Economist and Executive Director
Norges Bank Monetary Policy
Oslo, April 2003

Executive Summary

In the past ten years a number of countries have adopted inflation targeting. The key advantage of this strategy is that monetary policy is guided by a simple, logical criterion: the gap between forecasted and target inflation. This simplicity can be deceptive, though. To start with, the inflation forecast must be unanimously perceived as committing the policy-setting committee to a particular policy decision, and therefore it must be of the best possible quality. In addition, the policy response to a given gap is not unique. It will always depend in an important way on several other considerations – including the policy-maker's preferences, the impact of monetary policy on output growth and unemployment, and the prevailing or foreseen economic conditions. In other words, inflation targeting is a precise framework with imprecise policy implications, and to be understood and generally accepted, it needs to be accompanied by clear and precise communication.

Since monetary policy effectiveness crucially depends on market perceptions, it is now increasingly recognized that transparency is of the essence. This is undoubtedly why all inflation targeting central banks have adopted the practice of producing Inflation Reports. The purpose of this study is to examine such reports by asking what information they should include and how they should be structured in order to achieve the purpose of communicating clearly the monetary policy strategy.

Inflation targeting central banks use many communication tools, such as press releases, press conferences, a variety of written documents and, increasingly, websites. Yet, Inflation Reports have generally become the central element of communication of inflation targeting central banks. They bear the burden of providing the central bank with the legitimacy that it needs, and they establish the bank's expertise in the area of inflation and monetary policy. To achieve these demanding aims, Inflation Reports must effectively present the inputs into decisions (data, forecasts, analyses), the decision process itself, and the possible risks associated with the chosen policy. They must do so in a complete, yet concise manner. They must also be authoritative, conveying the views of the decision-makers, not just staff analyses as in the traditional Bulletins.

The list of issues an Inflation Report should address includes:

- a discussion of the objectives of policy, the decision-making process and how conflicting objectives are treated;
- an account of the analytical framework and information on which policies are based;
- a presentation of inflation forecasts and an evaluation of past forecasts and policy performance.

While there is no unique order and manner in which these themes need to be dealt with, clarity of presentation and consistency over time are crucial.

The study describes the Inflation Reports produced by 19 inflation-targeting central banks. The detailed analysis shows that many features are generally shared by most Reports: inflation forecasts and an analysis of forces shaping inflation, the decision process and efficient executive summaries. Other desirable features are sometimes lacking or treated too lightly. This is the case, for example, of the methods and assumptions used to produce the inflation forecasts, the degree to which policy-setting committees agree among themselves and how they assess the risks ahead.

The study also offers an evaluation of the Inflation Reports. To do so, it relies on a questionnaire completed by independent evaluators, covering an exhaustive list of attributes. In general, an Inflation Report that does well on one particular dimension does well in most others. While those central banks that adopted inflation targeting long ago tend to achieve high ratings, this is not systematically so. In addition, recent adopters have jumped up the quality ladder.

The acid test of this analysis must be whether 'good' Inflation Reports lead to a better understanding of monetary policy decisions. For this to be the case, it must be that central banks that achieve consistently high ratings are more predictable than those with less appreciated Reports. A series of statistical tests suggests that this is indeed the case.

1 Introduction

Inflation targeting deeply affects the conduct of monetary policy. It imposes a tight logic on policy actions[1] and it also calls for a radically changed approach to communication. Under inflation targeting (IT) the central bank unambiguously relates its policy actions to its inflation forecasts, so these must be credible and not merely adjusted to justify the policy decisions. IT therefore greatly enhances the need for precise communication.

The need for communication goes much deeper, however. IT is not a mechanistic approach to monetary policy-making. A given deviation of the inflation forecast from the target can be dealt with in an infinite number of ways since the gap can be eliminated more or less rapidly with implications for growth and employment. Put differently, under IT the central bank must make it clear that its decisions are the result of a thorough evaluation of the possible adjustment paths constrained by the inflation forecast. Merely announcing IT and publishing inflation forecasts is not enough: the benefits from IT only accrue to central banks that convince the public that their decisions are rooted in the relatively tight constraints imposed by a process that starts with forecasts, considers the optimal responses and ends with decisions which, year after year, appear as derived from the same logic. It is not surprising, therefore, that most central banks committed to IT have found it necessary to develop new internal policy analysis procedures and have elaborated their communication strategies. A frequent component of these strategies is a publication dedicated to IT.

These publications are usually referred to as Inflation Reports (IR), no doubt following on the track of the Bank of England's celebrated publication first produced in 1993. Not all inflation targeters publish explicit IRs, since some have adapted pre-existing bulletins or regular publications, yet we will refer to them as IRs. The exact titles, along with other information, are shown in Table 1.1.

In general, the formal start of IT is shortly followed by the publication of an IR.[2] Most IRs are published quarterly, and their frequency is not identical to monetary policy-making decisions (only two countries, Canada and New Zealand, explicitly establish the link), an issue to which we return below. Most IRs are quite lengthy, typically ranging from 50 to 100 pages.

This paper is not about IT. Its purpose is to evaluate current IR practices, one of many means of written and other communication used by central banks. Since the practice of publishing IRs is intimately linked to the adoption of an IT strategy, some general observations are warranted. The adoption of IT is generally accompanied by the granting of formal independence and the adoption of decision-making by committee. With two exceptions (New Zealand and Israel), each IT central bank relies on a monetary policy committee (hereafter MPC although the name varies from one country to another), chaired by the governor and whose members vote on the policy decision, as documented in Table 1.2. The voting rules differ, as does the role of individual MPC members, some of whom are not full-time employees of the bank. Sometimes MPC members are individually responsible for their votes; in other cases the responsibility is collective.

The need for independence and for the adoption of MPCs in an IT framework is not difficult to see. IT casts policy decisions in a precise framework, which requires that the central bank be free to pursue its mandate of low inflation, without being subject to extraneous contingencies imposed by the political authorities. The independence can be limited to the choice of actions (instrument independence) or it can also include the definition of the inflation target (target independence).

Independence, in turn, calls for legitimacy and accountability since the citizens in effect delegate an important responsibility to unelected officials.[3] Given that monetary policy decisions are rarely black-and-white, it is desirable

1 There is by now a large literature on IT. An early reference is Leiderman and Svensson (1995) and the basic rationale is exposed in Svensson (1999). Recent general overviews can be found in Bernanke *et al.* (1998), Loayza and Soto (2001), Mishkin and Schmidt-Hebbel (2001) and Gjedrem (2001). Individual country experiments have been evaluated by Kohn (2000) for the United Kingdom, Svensson (2001) for New Zealand and Svensson *et al.* (2002) for Norway.

2 In some cases (e.g. Chile), the starting IT date indicated by Mishkin and Schmidt-Hebbel (2001) is *de facto,* preceding the formal shift by several years.

3 This stands in contrast with other bureaucracies that operate under the formal responsibility of a government minister who is, individually or collectively with the whole government or its parliamentary support, subject to electoral approval or disapproval.

Table 1.1 Inflation Reports among inflation-targeting central banks

	Australia	Brazil	Canada	Chile	Colombia	Czech Rep.	Hungary	Iceland	Israel	South Korea	Mexico
Title	Statement on Monetary Policy	Inflation Report	Monetary Policy Report	Monetary Policy Report	Report to the Congress	Inflation Report	Quarterly Report on Inflation	Monetary Bulletin	Inflation Report	Monetary Policy Report	Inflation Report
Start of inflation targeting	Sep '94	Jun '99	Feb '91	Jan '91	Sep '99	Jan '98	Jul '01	Mar '01	Jan '92	Apr '98	Jan '99
First IR	May '97	Jul '99	May '95	May '00	Mar '97	Apr '98	Nov '98	Nov '99	Feb '98	1998	Mar '99
Frequency	Quarterly	Quarterly	Quarterly(b)	3 per year	Semi-annual	Quarterly	Quarterly	Quarterly	Semi-annual	Annual	Quarterly(a)
Length of report (approximate)	50	150	30	100	100	50	50-100	50	50	150	100

	New Zealand	Norway	Peru	Philippines	Poland	South Africa	Sweden	Switzerland	Thailand	United Kingdom
Title	Monetary Policy Statement	Inflation Report	Inflation Report	Inflation Report	Inflation Report	Monetary Policy Review	Inflation Report	Quarterly Bulletin	Inflation Report	Inflation Report
Start of inflation targeting	Apr '88	Mar '01	Jan '02	Jan '02	Oct '98	Feb '00	Jan '93	Jan '00	May '00	Oct '92
First IR	Apr '90	Dec '96	Jun '02	Mar '02	1995	Mar '01	Oct '93	1983	Jul '00	Feb '93
Frequency	Quarterly	3 per year	3 per year	Quarterly	Quarterly	Semi-annual	Quarterly	Quarterly	Quarterly	Quarterly
Length of report (approximate)	50	50	35	50	100	30	100	100	100	60-70

Notes: There is some debate about the date when IT was introduced in some countries. We have followed Mishkin and Schmidt-Hebbel (2001) except where some central banks suggested other starting dates.
(a) Semi-annual before 2000. (b) Two MPRs and two Updates since February 2000.

Table 1.2. Main elements of inflation targeting practices

	Australia	Brazil	Canada	Chile	Colombia	Czech Republic	Hungary
MPC	Board	MPC	Governing Council(a)	Board of Directors	Board of Directors	Bank Board	Central Bank Council
Size of the MPC	9	9	6	5	7	7	at most 6
Decision process	Concsnsus	Voting(b)	Concsnsus	Voting(b)	Voting	Voting(b)	Voting(b)
Publication of minutes	No	Yes	No	Yes (extracts)	No	Yes (delay 12 days)	No
Inflation Target	2-3% 'central tendancy' of headline CPI inflation	Headline CPI (tolerance band of +/- 2.5%)	2% target range 1-3%	Headline CPI 3% (target range 2-4%)	Headline CPI 6% (2002)	Headline CPI 2-4%	4.5% (2002) and 3.5% (2003) (+/- 1%)
Inflation Forecast	Staff	Staff and private	Governing Council	Staff	Staff	Staff and private	Staff

	Iceland	Israel	South Korea	Mexico	New Zealand	Norway	Peru
MPC	Board of Governers	Senior Monetary Forum(e)	MPC	Governing Board	MPC	Executive Board	Board of Directors
Size of the MPC	3	5	7	5	variable number	7	7
Decision process	Voting(d)	Governor	Majority	Majority vote	Governor(c)	Voting (consensus)	Voting
Publication of minutes	No	No	Yes	No	No	No	No
Inflation Target	CPI 2.5% (+/- 1.5%)	CPI 2-3% (2002) , 1-3% subsequently	3% (+/- 1%)	Headline CPI 4.5% (2002), 3% (2003)	Headline CPI 1-3%	2.5%	2.5% +/-1
Inflation Forecast	Staff	Staff	Staff	Private	Governor	Staff	Staff

	Philippines	Poland	South Africa	Sweden	Switzerland	Thailand	United Kingdom
MPC	Monetary Board	MPC	MPC	Executive Board	Gov. B	MPC	MPC
Size of the MPC	7	10	8	6	3	7	9
Decision process	Voting	Voting	Voting(b)	Voting(b)	Consensus	Consensus	Voting(b)
Publication of minutes	Highlights	Votes	No	Yes (2 weeks delay)	No	No	Yes (2 weeks delay + individuals votes)
Inflation Target	Headline CPI 4.5-5.5%	Headline <4%	CPIX 3-6% (2002), 3-6% (2004 and 2005)	CPIX 2% (+/- 1%)	Headline CPI <2%	Core 0-3.5%	RPIX: 2.5% (deviations in excess of +/- 1% require a formal explanation)
Inflation Forecast	Private sector(e)	Staff	Staff and MPC	Executive Board	Governing Board	MPC	MPC

Notes: (a) The Minister of Finance has the authority to direct the governor to follow a specific policy course. This override authority has never been used so far. (b) The governor can break a tie. Dissenting votes are reported in the minutes. (c) The chairman can break a tie. (d) The MPC is an internal advisory committee which does have formal voting rights. (e) The Bank 'signals its expectations' and quotes private-sector forecasts 'as an indication of expectations'. (e) The decisions are taken by the governor. The SMF is composed of staff and has no independent status.

to rely on a process that involves the confrontation of diverse viewpoints. Of course, the decision could be taken by the governor alone, as is the case in New Zealand, but even so the governor would almost surely always want to take advice. Collective decision-making makes this process of advice-taking formal, in effect enhancing the accountability of those who may be called upon to influence the final decisions.

When decisions are taken following formal deliberations, it is natural to ask whether the minutes of these meetings should be made public. Out of the 21 central banks examined in Table 1.2, eight publish some form of minutes, sometimes reporting vote outcomes, sometimes even how individual MPC members voted. When individual votes are reported, the decision process is individual instead of being collective, shifting accountability from the committee as a whole to each of its members.[4] In all cases, however, accountability requires that the central bank explains and justifies its actions.

In order to justify its actions, an IT central bank needs to refer to its mission and to the strategy adopted to fulfil the mission. The mission is defined by the inflation target, which must therefore be precise and publicly stated. This is indeed the practice adopted by all IT central banks, as indicated in Table 1.2.

The bank's strategy is more difficult to formulate and present. IT is not a mechanical rule. While it implies that the interest rate be raised whenever the inflation forecast exceeds the target at the relevant horizon, this can be done in many ways, for example, by a sharp instantaneous adjustment or several smaller steps. The desirable course of action depends on a wide array of considerations, including the impact of policy actions on a range of economic variables (growth, unemployment, the exchange rate, the current account, etc.), and therefore on prevailing broad economic conditions. A precise strategy statement would have to specify how policy actions are adapted to circumstances. Since the list of potential circumstances is unbounded, the strategy cannot be fully contingent.[5] The strategy is unavoidably imprecise, and the MPC will have to make it happen gradually as changing circumstances elicit new reactions. This characteristic increases the need for regular communication and explanations.

In addition, the inflation forecast itself is subject to uncertainty. An implication is that policy reactions to a given gap between the forecast and the target may sharply differ depending on how confident the MPC is about the forecast. Typically, the less confident it is, the more restrained will be its action.[6] Another implication is that the forecasts will often turn out to have been inaccurate, which immediately raises the suspicion that the MPC may have deliberately misled the public. Hence the importance of providing detailed information on how the inflation forecast is prepared.

In most IT central banks, the inflation forecast is the responsibility of the professional staff, although sometimes the central bank adopts forecasts produced by the private sector (banks or research organizations). In some cases, such as the Bank of England, the Bank of Canada, the Reserve Bank of New Zealand and the Riksbank, it is the MPC or the governor who takes responsibility for the inflation forecast. Many IT central banks also provide an indication of the degree of confidence in the inflation forecast in the form of fan charts. In all cases, the central bank must explain how it goes about producing the forecast, reassuring the public that it relies on state-of-the-art techniques. In brief, an IT central bank must earn a reputation as an expert in forecasting inflation.

All in all, an IT central bank's need for communication is highly demanding. Every ingredient that goes into decision-making, from the decision process itself to the underlying reasoning and to the technical preparation of decisions, is potentially important in assessing how the bank discharges its mandate. The burden of the proof squarely lies on the MPC and the staff. It is natural, therefore, that IT central banks have felt the need to produce a detailed document, the IR.

In addition, as unelected officials with a legal mandate to deliver price stability, central banks must gather support for their actions, even if these actions may occasionally have unpleasant consequences, and particularly when some segments of society are called upon to bear a larger portion of the burden than others. An IT central bank cannot succeed in its mission unless it has built a strong constituency for price stability. IRs, along with all other channels of communication, thus have an important role to play in explaining to the public at large the importance of price stability. This is what central banks often refer to as their pedagogical role.

Finally, and more generally, all central banks – irrespective of their strategy – stand to benefit from being transparent enough to be fully predictable.[7] Central banks only control directly the very short-term end of the interest rate maturity spectrum. Yet in most countries monetary policy operates through longer-term interest rates, the exchange rate and asset prices, all of which are set by the markets and predominantly shaped by expectations. Effectiveness, therefore, is enhanced when the central bank can affect market expectations at long horizons. Since the central bank cannot commit itself to a course of action over several years, the best that it can do is to ensure that the markets clearly perceive its logic and the strategic implications. When they do, based on available infor-

4 For a discussion of these two forms of responsibility, see Blinder *et al.* (2001).

5 It cannot be described in such simple terms as: 'in this situation this is the procedure to be followed'.

6 The rationale dates back to Brainard (1967).

7 The point is made in Blinder (1998) and Blinder *et al.* (2001).

mation, they (markets) will endeavour to formulate educated guesses of what is the most likely course of action of the central bank. In that way, by being transparent and perceived as fully trustworthy, central banks may orient market thinking and indirectly affect long-term interest rates, the exchange rate and asset prices.

Section 2 develops our views on what role the IR should play in an IT framework and what it must contain to attain maximum effectiveness. Section 3 reports on a survey we conducted to evaluate the content of IRs from 20 IT countries. The results from that survey are used in Section 4, which contains an empirical study of the relationship between the characteristics of IRs and the predictability of monetary policy. A final section presents our conclusions.

2 The Communication Role of Inflation Reports in an Inflation Targeting Framework

We have argued that IT requires substantial transparency on the part of the central bank in order for it to establish and maintain legitimacy on the one hand, and in order for the public to monitor its action and enforce accountability, on the other. In addition, policy efficiency requires that the central bank's actions should be predictable by actors in the financial markets. Communication with many segments of the public is necessary to achieve these aims. Here we discuss what the communication must convey to different audiences, what form the communication should take and who should communicate, before we draw some implications for the form of an effective IR.

2.1 What needs to be communicated to whom?

To achieve legitimacy as the manager of monetary policy the central bank must convince the public that its objectives are compatible with the objectives of the population as a whole, and that it has the expertise required to achieve these goals. If legislators can grant central banks independence, they can also take that independence away if they deem that the actions of the central bank do not serve the interests of the public at large. The central bank must therefore not only communicate clearly what its objectives are, but also justify why these objectives are reasonable and worth pursuing. The target audience here is wide, ranging from opinion-makers in the media to politicians and ultimately to the whole electorate. The style and form of communication must be adapted in consequence.

Legitimacy as the manager of economic policy also requires that the central bank is perceived as competent and fully able to achieve its objectives effectively and efficiently. It must therefore communicate its strategy, explain why this is appropriate, and show how its staff and decision makers are up to the task of executing it. This in turn requires spelling out the analytical framework that the staff is using to produce forecasts of inflation and other crucial variables, the information used as inputs in these forecasts, and the technical aspects of preparing them. The audience here is narrow, consisting of analysts in financial institutions and specialists in the media who regularly scrutinize and comment on monetary policy in newspapers and on television. This audience can either do great harm to a central bank's legitimacy by exposing inadequate analysis or, on the contrary, it can provide a boost by acknowledging the competence of the central bank.

For efficient monitoring and accountability, the public needs to see clearly what objectives the central bank is trying to achieve and who is ultimately responsible for the policy decisions. This calls for the publication of inflation forecasts as well as for continuous and comprehensive assessment of the accuracy of past forecasts. Releasing forecasts is crucial for the comprehensibility of policy decisions and for the ability of observers to evaluate the performance of the information-processing performance of the central bank staff.

Finally, policy actions can be predictable only if the central bank reveals its analytical framework, sources of information and method of aggregating this information. Market participants should be able to come up with roughly the same inflation forecast as the central bank. They might not agree with the underlying model used for this forecast, but they should know how it is produced and what information goes into it. Predictability of policy responses further requires an understanding of the reaction of MPC members to deviations of the forecast from the target. This understanding will never be perfect because the reactions always incorporate a certain amount of individual judgement, but publication of the deliberations of the MPC including the individual voting records (when decisions are taken by vote) is useful. Careful analysis of the sources of past forecast errors is also important in this context.

2.2 What form should communication take?

Central banks communicate in many ways: speeches by the governor and MPC members, minutes of MPC meetings, an internet website, pamphlets of various kinds describing the role and operations of the central bank, IRs, quarterly bulletins, annual reports, press releases and research papers produced by the staff. Each of these has its intended audience and specific purpose, and as such they have all an important role to play in the overall communication strategy of the bank. Indeed, Andersson *et al.* (2001) suggest that speeches of the governor of the Swedish Riksbank have been as important a determinant of movements in the term structure of interest rates in Sweden as changes in the repo rate.

Different aspects of the process leading to monetary policy decisions need to be communicated through different channels. To convey details of the analytical framework that the central bank is using to prepare inflation forecasts and other material that forms the basis of policy decisions, there is probably no efficient alternative to written forms of communication. For example, most central banks publish research working papers which study the analytical issues that have been raised in connection with the implementation of IT. Is our focus on IRs too limited, then?

We could have evaluated the entire set. But too much information may kill information. Our basic approach is that different documents are indeed needed to deal with the heterogeneous audiences of central banks but that a reasonably compact and synthetic document is needed, and that is precisely what IRs have been invented for. In addition, by multiplying the information, a central bank may send subtly different messages to different constituencies, thus using communication to obfuscate not to enhance transparency. In our view, the IR serves the essential role of bringing together what the policy-makers themselves see as crucial information, leaving important details to other forms of communication.[8] The evidence presented in Section 4 below shows that those central banks that devote the necessary effort to producing high-quality and thoughtful IRs are indeed more predictable.

2.3 Who communicates? Ownership of the Inflation Report

An important and difficult question concerns whose pen is drafting the IR. Two logics are possible. In the first one, the IR is meant to convey the policy-makers' views, their analysis and interpretation of the facts, their doubts and assumptions. In the second logic, the IR is the bank's way of sharing with the public all the ingredients – prepared by the staff – that go into the policy-making pot. In the first case, the IR is an authoritative statement that needs to be signed by the MPC; in the second case the MPC keeps its distance and leaves the pen in the hands of the staff.

This distinction is too stark, of course. Obviously all the data collection and treatment are carried out exclusively by the staff, so most sections of the IR do not need the MPC's endorsement. On the other side, the policy discussion section obviously belongs to the MPC. It is therefore possible to envision different sections with different ownerships. Still, even that approach is too stark. For example, the choice of topics, and the space and importance accorded to specific issues, must reflect the policy-makers' preoccupations. Similarly, in many central banks, the MPC is presented with the staff's analysis of the situation and of policy options (such as simulated effects of several interest-rate paths) that serve to frame the policy deliberations.

The situation is even more complicated than meets the eye. The nature of decision-making also matters. Incollegial committees, the MPC must in the end agree on a common view, possibly with minority opinions. In individual committees, each MPC member is personally accountable and should have his or her view aired in the relevant IR sections. In addition, in many countries, some MPC members are appointed by political parties or meant to represents the interest of particular segments of society. Yet, for the central bank to be independent, these members ought to be freed from their opinions. Too much openness might occasionally pit them against their natural constituencies, ultimately reducing their effective independence. Furthermore, in many cases, the MPC includes full-time internal members and part-time external members, with varying degrees of information and expertise.

Finally, there is the issue of the relationship between the date of publication of the IR and the meeting and decisions of the MPC. In many countries these two dates do not coincide, effectively preventing any discussion of current monetary policy decisions in the IR.[9] In these cases there is no choice but to communicate the precise policy decision separately from the IR, and restrict the latter to a presentation of the background material for the decision.

In the end, there probably is no best solution. Different institutional arrangements call for different situations.

8 For example, the Bank of Sweden has explicitly decided not to include press releases and minutes of the deliberations of the Executive Board in the IR.

9 Ideally, the frequency and timing of the publication of IRs should be tied to the frequency and timing of MPC meetings. MPCs typically meet about once a month. Most central banks consider that frequent IRs would be highly repetitive and impose an excessive burden on the staff. A solution, adopted by the Bank of Canada, is to produce brief updates.

The more professional the MPC is, the more it will want to be seen as the author of the policy section of the IR. Given the amount of work that goes into the information sections, the staff's hand is likely to always be prevalent there.

2.4 Implications for Inflation Reports

What does this discussion tell us about what constitutes 'best practice' in terms of the content of IRs? We believe that the logic of IT requires that three broad themes must be particularly well-treated for an IR to have the intended effect: first, a discussion of the objectives of policy, the decision-making process and how conflicting objectives are treated; second, an account of the analytical framework and information on which policies are based; and third, a presentation of inflation forecasts and an evaluation of past forecasts and policy performance. While there is no unique order and manner in which these themes need to be dealt with, clarity of presentation and consistency over time are crucial.

2.4.1 Objectives and the decision-making process

IT is explicitly built on the definition of a target inflation rate (or range). It is obvious that the IR should be forthright about the target and the tolerance margin. This is the case for most IT central banks, although four (Colombia, Norway, Poland and Switzerland) are somewhat imprecise.[10] It is equally obvious that the Report must be clear about who is responsible for taking the policy decisions that are required to achieve the stated objective.

It is more difficult to be specific about how best to convey the decision-making process in the face of policy trade-offs. There will be times when the concern for inflation will require tightening policy while apprehension about employment and output developments would call for the opposite. Some discussion of how the MPC views such conflicts is necessary for reason of both legitimacy and predictability. Although the publication of the weights attached to inflation and output in some notional objective function of the MPC members is clearly unrealistic, some sense of how policy decisions take into account potential conflicts between these two goals needs to be communicated.

There are compelling reasons for a central bank to communicate the content of the discussions of its MPC, including, when relevant, the voting of individual members. Since the number of MPC meetings is always larger than the number of IRs, some arrangement has to be found. A similar issue concerns the preparation of MPC meetings. IRs are usually derived from the preparatory work leading to policy decisions. As MPC meetings occur in between the publication of IRs, some information that is relevant for these meetings is not provided to the public, at least in the increasingly familiar form of an IR.

A good solution, adopted by the Bank of England, is to issue a separate document (for instance posted on the website) when minutes or summaries of the MPC's deliberations are released and republish these, possibly in an abridged form, in the subsequent IR. Another solution, adopted by the Bank of Canada, is to publish a short update which includes in a standard abridged form the information considered by its MPC (the Governing Council) and the conclusions reached in the three months since the last full report. Yet another solution, also adopted by the Bank of Canada, is to link the press releases announcing interest-rate decisions back to the most recent IR (or update).

The IR should also contain a comment on how past decisions have responded to changes in the economic environment, in order to convey a sense of the implicit objective function of the MPC members.

2.4.2 Analytical framework

Ensuring that the central bank's inflation forecast is viewed as objective and not simply a justification for policy decisions taken according to other criteria requires a credible and consistent analytical framework. Communicating the nature of this framework represents an important challenge.

The standard practice is to use one or more models to generate forecasts on the basis of available information and a number of assumptions such as the future evolution of interest and exchange rates, asset prices, and domestic and foreign economic conditions. The forecasts generated in this way are then adjusted by the staff and, in some instances, by the MPC or the governor. This adjustment incorporates the sense of reality that formal models lack (or, more precisely, relegate to the error term).

10 The Bank of England states that it does not strictly have a target band: 'We have a point target for inflation rather than a target range. The 1.5% and 3.5% points merely trigger an Open Letter to the Chancellor from the Governor explaining the reasons for the under/overshoot and what the Committee plans to do about it. But this is really part of the accountability process, not part of the definition of the target.' (private communication)

The central bank ought to communicate these steps fully. Publishing the forecasting model(s) can be the object of a separate, suitably updated publication. The predictions generated by such model(s) can well be published in the IR which would then focus on the reasoning behind the subsequent adjustment. This implies laying out in some detail what the main sources of inflationary impulses in the economy are, and what the nature of the transmission mechanism is from these shocks to prices. Of course, this does not need to be done for every single variable in every report, but there must be a continuity of approach and explanations that over time give a repeat reader a clear idea of the thinking behind the analysis of the bank staff.

Similar remarks apply to the description of the economic environment and other information that serve as a basis for inflation and growth forecasts. The presentation of a comprehensive set of underlying data is essential, but it is important to guard against information overload. Emphasis should be placed only on those factors that the MPC (or the staff) consider to be most important in the determination of inflation (and growth) in the economy. Put differently, devoting space to a discussion of only marginally relevant factors may be as harmful as passing only cursorily over more relevant ones.

Countries differ in their structure. Hence it is not possible to define a unique set of variables and transmission mechanisms that all countries need to focus on. Oil prices and the exchange rate are particularly important in Norway, whereas economic activity in the United States may be crucial in Mexico. Similarly, as the economy and the external environment changes, the IR needs to adjust. In addition, the central bank's own analysis needs to pay attention to the concerns of other analysts and observers in the economy. A good example is the fact that sections on asset prices have appeared in several recent IRs. Many central bank officials had until recently tended to disregard the importance of these prices for monetary policy, but frequent reference to them in academic writings and the specialized press created a need to articulate the banks' view more carefully.

2.4.3 Inflation forecast and performance evaluation

The main indicator of the need for policy adjustment in an IT country is the deviation of a medium-term inflation forecast from the target. The success of the whole monetary policy strategy and the credibility of the central bank therefore hinge on the quality of its inflation forecast. A central feature of all IRs must therefore be the presentation of the MPC's (or the staff's as may be the case) current inflation forecast both in terms of a central tendency and some measure of uncertainty, such as a fan chart.

As forecast errors will always be made, however, candour requires that the central bank acknowledges them and comments on their sources. An analysis of past forecast performance should therefore be a regular feature of IRs.

2.4.4 Additional do's and don'ts

For users of IRs a number of additional characteristics help to make them attractive and functional. Features that are particularly important, both in our own judgement and in that of financial journalists and analysts in Norway and Sweden that we have consulted as part of the background work for this paper, include the following:

- A concise but complete executive summary. This is often what financial analysts in banks base their initial impression on, and it is therefore essential that it conveys the main message of the entire report as accurately as possible.
- Continuity. Repeat users of IRs can save a lot of valuable time if presentations of inflation forecasts, central data tables, executive summaries, policy conclusions and so on are always presented in comparable formats and placed in the same position from report to report. Over time, the IR becomes an important reference tool for journalists and market participants, and continuity of presentation then takes on a particular importance.
- Excessive length should be avoided, because it puts off readers that have many other demands on their time, and it almost invariably leads to a dilution of the information content to the point of making it difficult to find the trees for the woods.
- Boxes on special topics can be an effective means to communicate new ideas that are incorporated into the analysis or decisions of the central bank. They can thus have an important educational function. In addition, they are frequently used by journalists as source material for their own articles, which helps to make the IR more visible.

There probably is no best way of putting this vast amount of information together. The precise structure of the IR matters relatively little provided it is clear and all the relevant information is logically presented.

3 Evaluating Inflation Reports

This section provides an analysis of IRs around the world. Our sample consists of 20 countries: the 19 countries identified as inflation targeters by Mishkin and Schmidt-Hebbel (2001) to which we added the four recent adopters (Hungary, Iceland, Norway and the Philippines). But we excluded Finland and Spain, now members of the euro area, as well as Colombia, because of limited information.[11] The list of IRs is shown in Appendix A.

In order to evaluate the IRs, we asked five readers to read the 20 IRs and rate a number of characteristics.[12] The readers were given 85 questions and each read the IRs in a different order from the others. The results of this procedure are presented in this section. In each case, we report the average rating and the standard deviation. Obviously, the small number of readers requires great caution in interpreting the results. In addition, only one report per country was evaluated – the latest one available when the collection was compiled. This may miss out special features that are regularly examined in some issues but not in every single one.[13] It may also be the case that in some countries economic conditions may be unique to the period under consideration. Ideally, the evaluation should be based on a large number of readers, drawn from the various audiences that central banks aim at, each of them considering several IRs for each IT central bank, a massive undertaking. An understandable budget constraint forced us to take a short cut.

3.1 Quality of information

We first examine the ability to convey key information to the reader: past decisions, current challenges, the strategy, ease of the recent decision-making and an indication of future decisions. The results appear in Table 3.1 which reports the average rating across readers, as well as the standard deviation, in order to provide an idea of differences in perceptions.

In general, it takes on average two hours to read an IR with quite some variability both across reports and across readers. Most reports achieve high ratings on their discussion of the challenges faced by the central bank, which is indeed the most crucial information since it allows readers to understand the MPC's current thinking. The IRs also generally communicate the strategy well.

Present and future decisions are less well explained or envisioned.[14] Central banks are understandably reluctant to commit themselves to a particular course of action. Yet the markets need to form a view of possible future moves, if only to price longer-term interest rates. Since in most countries, these are the rates through which monetary policy is transmitted, a key challenge for central banks is to affect expectations. This is why some MPCs routinely comment on their likely biases or evaluate the balance of their inclinations. It is also important that central banks share any reactions that they may have had about their own past decisions, since this is how observers can understand the monetary policy strategy. This applies to past mistaken decisions. *Errare humanum est*, so observers are willing to concede to central banks the right to make mistakes, but it requires some ingenuity to admit that this has happened. These results suggest that, with few exceptions, progress remains to be made in both dimensions.

11 The Swiss National Bank does not consider itself as pursuing an inflation targeting strategy, a distinction described as follows by the IMF: 'Despite similarities with inflation targeting, the new framework differs from it in one important respect, namely it does not contain an institutional commitment to an inflation target as an overriding objective' (Article IV Consultation Report, 2000); see also the OECD Annual Reports. We decided to keep it in our sample, though, because our criterion for inclusion is the Mishkin and Schmidt-Hebbel classification which may be imperfect but offers an independent benchmark.

12 The readers are graduate students in economics familiar with broad principles but not necessarily central bank watchers. Only one author of the paper was part of the reading group. The IRs were read in their English versions, which may result in some loss from the original version. But as IRs are widely read in English, for instance by financial analysts around the world, each central bank must feel responsible for the quality of the translation.

13 For example, the Bank of Sweden includes an evaluation of past policy decisions in the first issue of each year.

14 The most notable exception is New Zealand, which maps out the future path of its interest rate.

Table 3.1 Quality of information provided (1=bad 10=good)

		Time to read entire report (minutes)	Discussion of past decisions	Discussion of current challenges	Presentation of the strategy	Disagreements within committee	Arguments for future decisions
Australia	mean	116	1.2	3.6	3.6	1.0	2.2
	s.d.	11.9	0.4	2.8	2.4	0.0	1.6
Brazil	mean	232	5.4	6.8	6.4	4.2	3.2
	s.d.	34.2	3.6	3.5	3.0	3.3	2.9
Canada	mean	90	4.8	6.8	7.4	1.0	6.0
	s.d.	27.6	1.9	0.4	0.5	0.0	1.2
Chile	mean	148	4.8	7.2	6.4	1.0	5.8
	s.d.	19.2	2.4	2.4	2.1	0.0	1.9
Czech Republic	mean	131	7.4	7.2	7.0	7.4	5.4
	s.d.	17.0	0.9	1.5	1.0	0.9	0.9
Hungary	mean	164	5.4	7.0	4.0	1.0	1.0
	s.d.	45.1	0.5	0.7	2.5	0.0	1.0
Iceland	mean	139	7.0	7.6	7.2	1.0	7.0
	s.d.	44.8	1.9	1.7	1.6	0.0	1.6
Israel	mean	135	8.0	7.8	7.0	1.0	4.0
	s.d.	25.5	0.7	1.1	1.2	0.0	3.0
Mexico	mean	178	5.0	5.4	6.4	1.0	3.4
	s.d.	39.0	1.9	2.1	2.1	0.0	2.3
New Zealand	mean	85	5.6	8.0	7.8	1.0	7.2
	s.d.	5.0	3.4	1.6	1.9	0.0	1.3
Norway	mean	80	1.8	6.2	5.0	1.0	3.0
	s.d.	7.9	1.1	2.0	2.9	0.0	3.2
Peru	mean	55	2.8	3.4	4.6	1.0	1.8
	s.d.	16.0	1.9	2.3	2.5	0.0	1.3
Philippines	mean	85	3.6	6.4	4.8	1.6	4.0
	s.d.	10.3	2.9	2.1	2.9	1.3	3.4
Poland	mean	151	4.4	5.0	4.0	3.6	1.2
	s.d.	48.8	2.6	2.6	2.9	2.5	0.8
South Africa	mean	82	4.8	7.2	6.0	1.0	4.0
	s.d.	19.2	2.5	1.1	1.2	0.0	2.8
South Korea	mean	144	9.0	5.8	7.0	1.0	5.0
	s.d.	5.5	0.0	1.3	0.7	0.0	1.6
Sweden	mean	157	1.0	6.6	3.8	1.0	2.0
	s.d.	44.1	0.7	3.0	3.0	0.0	3.4
Switzerland	mean	118	3.6	5.4	5.2	1.0	0.8
	s.d.	48.3	1.9	2.1	1.8	0.0	0.8
Thailand	mean	140	2.4	8.0	7.6	1.0	2.8
	s.d.	34.8	1.9	1.2	2.1	0.0	2.2
United Kingdom	mean	169	8.2	8.8	8.8	5.4	4.2
	s.d.	32.5	2.7	1.1	1.1	2.7	3.3

Table 3.2 Clarity on assumptions made at time of decision (1=bad 10=good)

			Domestic demand			Foreign financial	Financial markets	
		Exchange Rate	Private	Public	Foreign demand	conditions	Financial markets	Uncertainty
Australia	mean	4.4	6.8	3.6	7.4	7.2	7.2	6.8
	s.d.	3.0	2.0	3.0	2.0	3.0	2.0	2.0
Brazil	mean	8.0	7.4	6.4	8.5	7.8	7.6	5.6
	s.d.	2.0	2.0	2.0	1.0	2.0	2.0	3.0
Canada	mean	4.2	6.8	2.4	6.0	6.2	6.2	6.6
	s.d.	2.0	1.0	2.0	2.0	2.0	2.0	1.0
Chile	mean	8.2	8.2	5.8	8.6	8.0	7.8	8.2
	s.d.	1.0	1.0	2.0	1.0	0.0	1.0	1.0
Czech Republic	mean	7.8	8.0	8.0	7.0	5.2	5.0	5.4
	s.d.	1.0	1.0	1.0	1.0	1.0	1.0	2.0
Hungary	mean	6.0	6.6	5.8	5.6	4.8	6.4	5.6
	s.d.	1.0	2.0	2.0	2.0	1.0	2.0	2.0
Iceland	mean	8.0	8.0	8.0	7.0	5.6	8.2	8.2
	s.d.	0.0	1.0	1.0	1.0	3.0	1.0	1.0
Israel	mean	6.0	5.8	7.2	5.2	5.0	6.2	6.2
	s.d.	2.0	1.0	1.0	1.0	1.0	2.0	1.0
Mexico	mean	4.2	6.8	5.8	8.2	5.4	5.2	6.8
	s.d.	2.0	2.0	2.0	1.0	2.0	2.0	1.0
New Zealand	mean	5.4	7.4	4.4	7.6	6.2	4.4	7.4
	s.d.	3.0	1.0	3.0	1.0	2.0	2.0	2.0
Norway	mean	8.6	8.2	7.4	6.8	5.0	5.0	6.0
	s.d.	2.0	0.0	1.0	2.0	2.0	1.0	1.0
Peru	mean	5.6	5.6	4.6	5.0	2.8	4.0	3.8
	s.d.	3.0	3.0	4.0	2.0	1.0	3.0	2.0
Philippines	mean	6.6	6.8	5.4	6.6	6.4	6.2	6.0
	s.d.	2.0	2.0	3.0	1.0	2.0	1.0	2.0
Poland	mean	6.8	7.4	6.2	7.2	3.2	4.6	4.4
	s.d.	3.0	1.0	2.0	1.0	2.0	1.0	1.0
South Africa	mean	6.4	7.2	5.8	6.8	4.0	3.4	6.2
	s.d.	3.0	1.0	3.0	2.0	1.0	1.0	2.0
South Korea	mean	6.2	5.8	2.6	3.2	5.4	8.6	4.4
	s.d.	2.0	1.0	1.0	2.0	2.0	2.0	1.0
Sweden	mean	6.4	8.0	7.2	7.2	7.6	8.4	8.6
	s.d.	1.0	1.0	2.0	2.0	2.0	1.0	1.0
Switzerland	mean	6.4	7.0	4.0	6.6	6.2	7.0	6.2
	s.d.	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Thailand	mean	5.25	7.6	5.8	6.75	6.8	7.2	8.6
	s.d.	3.0	2.0	2.0	2.0	2.0	1.0	1.0
United Kingdom	mean	7.4	9.6	9.0	9.0	9.0	9.2	8.4
	s.d.	2.0	1.0	1.0	1.0	1.0	1.0	1.0

3.2 Clarity of assumptions

Table 3.2 looks at how precisely the assumptions about key macroeconomic variables are communicated. The reports usually provide adequate information, especially regarding the state of private domestic and foreign demand. Assumptions about public demand tend to be systematically less well formulated. A small number of central banks systematically score less well. It may be interesting to note that the central banks that achieve good ratings in Table 3.1 also do so in Table 3.2. The correlation across countries between these average measures is 0.60.

3.3 Quantity of information provided

Another set of questions concerns the quantity of information provided regarding three key variables (inflation, growth and detailed prices evolution), the risks to their assessment and the tenor of the policy debates within the policy-making committee. The questions asked whether information is optimal (a rating of 5), insufficient or excessive. The results appear in Table 3.3.

Most central banks achieve close to the ideal concerning inflation, with very little disagreement among the readers. The record is nearly as good regarding the evolution of detailed price series. Thus, at least through their IRs, the central banks have established themselves as specialists in the analysis of the inflation process, an objective that every IT bank ought to have high on its list of communication objectives.

The performance is less impressive regarding growth. Many outside observers consider that even IT central banks follow Taylor rules, a flexible form of IT in Svensson's terminology.[15] The amount of information provided on growth tends to be significantly less adequate than on inflation. This may reflect a genuine emphasis of the central bank on inflation. Alternatively, it may be a desire to underplay the role of growth in shaping monetary policy.

The presentation of the risks of policy choices is also felt to be somewhat insufficient. Flexible IT allows, indeed calls for, a significant degree of interpretation of the data and a complete assessment of uncertainty. This has led numerous central banks to adopt, among other devices, the use of fan charts to present forecasts, even though the width of the fans is rarely adjusted to reflect time-varying uncertainty.[16] Although many central banks are found to provide information that is close to ideal on how they perceive risks ahead, a number of others seem to be reluctant to share their views on this issue.

Finally, a last question concerned the quantity of information provided on policy discussions in the MPCs, this was a test of transparency. With few exceptions, IRs provide no, or very little, information on these discussions. It can be argued that transparency means, to begin with, a clear framework and the sharing of the relevant factual information, both of which are well communicated by most central banks. Central banks are loath to reject the idea that they blindly follow simple rules, however, and this must imply a significant degree of judgement in applying the framework to data. Disagreements are bound to surface among key policy-makers, even in central banks where the final decision is made by the governor. These disagreements are as informative as the other aspects (strategy, forecasts, data), for they allow the public to form views on the implicit models and preference parameters of policy-makers.

3.4 Overall trade-off

The ideal IR is concise, yet it includes all but only the relevant information, and is of high quality. Figures 3.1 and 3.2 provide a simple summary of the performance of the IT countries under study. Figure 3.1 displays the relationship between the time needed to read a report and the quantity of information provided. The latter is measured as the unweighted average of the columns displayed in Table 3.3, excluding the last column on MPC discussions which refers to transparency rather than to policy-making proper. The ideal position is around 5 for the quantity of information and as low as possible for the time to read. The figure also displays a simple regression which suggests a fixed cost of 40 minutes and an investment of 22 minutes to raise the quantity by 1 point on our 1-10 scale.[17]

Figure 3.2 examines the link between quantity (measured as previously indicated) and quality measured as the unweighted average of the columns on past decisions, current challenges and the strategy, as shown in Table 3.1 (the two other criteria, ease of the recent decision-making and indications of future decisions are left out since they refer to transparency rather than to the rationale of current decisions). The figure shows that in general quality and

15 On the distinction between IT and Taylor rules, see Svensson (2001).
16 The Swedish Riksbank appears to be in the forefront in this respect.
17 We are indebted to Akiva Offenbacher from the Bank of Israel for suggesting this analysis.

Table 3.3 Quantity of information provided (0=not enough 10= too much 5=ideal)

		Inflation	Detailed prices	Growth	Risks	Policy discussion in committee
	s.d.	0.4	1.1	0.8	0.4	0.0
Brazil	mean	6.2	6.4	5.6	4.4	3.0
	s.d.	2.3	2.3	2.7	1.1	2.4
Canada	mean	3.6	3.0	3.4	3.2	0.0
	s.d.	1.1	1.0	1.5	0.4	0.0
Chile	mean	5.2	3.4	5.2	4.6	0.2
	s.d.	1.1	1.7	1.1	0.5	0.4
Czech Republic	mean	6.4	6.0	4.2	2.8	4.0
	s.d.	1.3	2.0	1.1	0.4	2.2
Hungary	mean	5.0	6.2	5.6	4.8	1.0
	s.d.	1.9	1.8	1.8	1.3	2.2
Iceland	mean	5.0	4.4	5.0	4.2	0.2
	s.d.	0.7	1.1	1.2	1.1	0.4
Israel	mean	3.0	2.4	2.6	3.2	0.0
	s.d.	1.2	1.9	0.5	0.8	0.0
Mexico	mean	4.6	3.8	4.6	4.8	0.0
	s.d.	0.9	1.8	1.3	1.3	0.0
New Zealand	mean	5.0	4.4	4.2	4.2	0.6
	s.d.	0.7	0.5	1.1	0.8	0.5
Norway	mean	5.0	3.6	3.8	4.2	0.0
	s.d.	0.7	1.5	0.8	1.3	0.0
Peru	mean	3.2	5.0	3.0	2.4	0.0
	s.d.	1.3	3.2	1.2	1.5	0.0
Philippines	mean	4.4	3.6	3.6	5.2	0.4
	s.d.	1.3	2.6	1.3	1.8	0.9
Poland	mean	6.0	4.6	1.6	2.2	0.4
	s.d.	1.9	3.2	1.8	1.1	0.5
South Africa	mean	5.6	4.0	3.8	3.6	0.4
	s.d.	1.8	2.1	1.3	1.8	0.5
South Korea	mean	4.4	4.8	4.2	2.4	0.4
	mean	4.6	2.6	3.4	5.4	0.2
Sweden						
	s.d.	2.2	1.3	1.1	0.9	0.4
Switzerland	mean	1.6	2.4	2.6	1.8	0.0
	s.d.	0.5	1.5	0.9	1.6	0.0
Thailand	mean	4.6	3.8	4.4	4.8	0.0
	s.d.	1.1	2.2	0.9	1.3	0.0
United Kingdom	mean	4.8	6.2	4.8	4.6	2.4
	s.d.	0.8	0.8	0.4	0.5	1.7

Figure 3.1. Time to read the IR and quantity of information provided

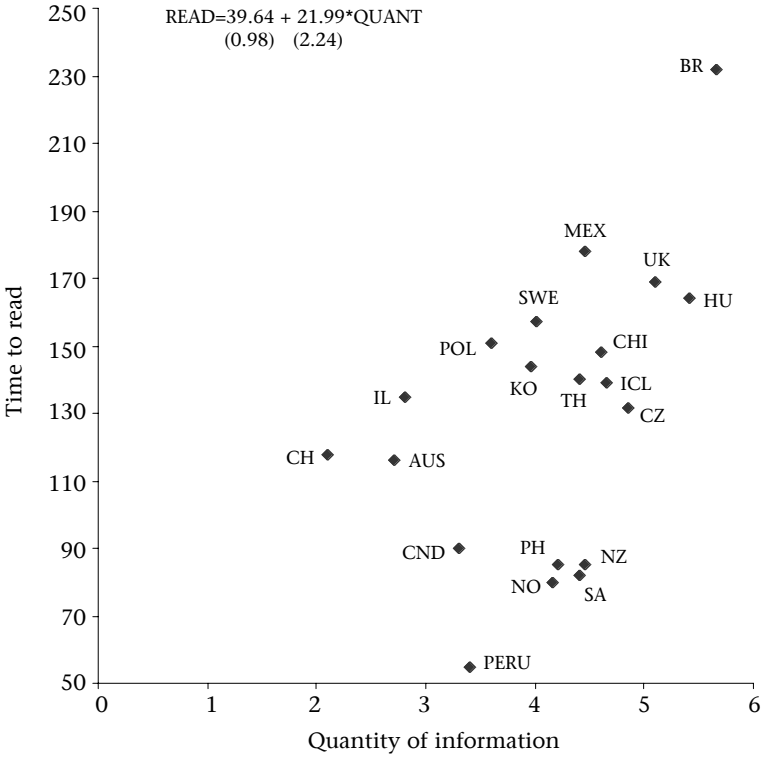


Figure 3.2 Quality and quantity of information

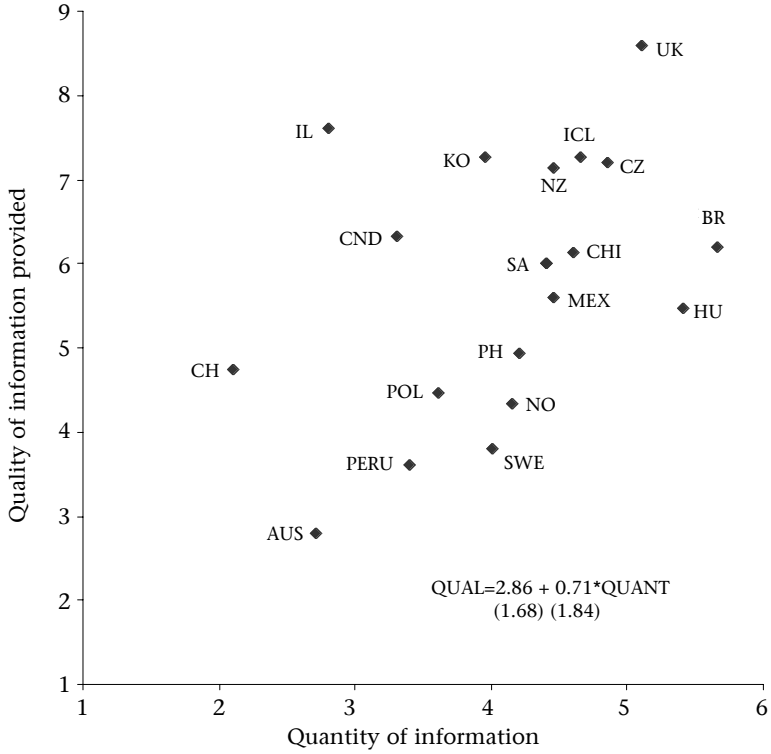


Table 3.4 How demanding is it to find information? (1=difficult 10=very easy)

		Who decides?	When are decisions taken?	What are the objectives of policy?	What information is used as input?	How is the information processed?
Australia	mean	5.6	2.8	2.2	3.4	1.4
	s.d.	1.3	2.0	1.6	2.5	0.5
Brazil	mean	8.8	5.6	7.4	8.2	5.8
	s.d.	1.3	3.4	0.9	1.6	3.8
Canada	mean	8.2	10.0	7.6	6.8	3.6
	s.d.	2.0	0.0	1.8	1.3	1.8
Chile	mean	9.0	7.2	9.2	7.2	5.2
	s.d.	2.2	2.6	1.1	0.4	1.6
Czech Republic	mean	9.4	3.0	7.4	8.0	5.8
	s.d.	0.9	2.3	2.9	1.0	2.2
Hungary	mean	8.4	1.8	7.2	7.8	3.2
	s.d.	2.1	1.5	2.2	0.8	1.8
Iceland	mean	7.8	2.4	9.0	8.8	6.0
	s.d.	2.9	1.3	1.0	0.4	3.2
Israel	mean	9.4	4.4	8.0	6.8	3.6
	s.d.	0.9	2.7	1.0	1.3	1.1
Mexico	mean	8.2	3.2	7.4	7.8	5.4
	s.d.	1.9	3.2	1.1	1.8	2.9
New Zealand	mean	9.4	2.2	9.4	8.0	5.2
	s.d.	0.9	0.8	0.9	1.9	2.8
Norway	mean	5.2	1.2	9.2	8.4	5.2
	s.d.	2.7	0.4	1.1	0.9	3.0
Peru	mean	7.6	5.4	9.0	3.0	5.2
	s.d.	1.9	3.4	1.0	1.0	0.7
Philippines	mean	9.4	5.0	8.6	6.8	4.2
	s.d.	0.9	3.0	0.9	1.3	2.7
Poland	mean	9.8	2.0	5.8	5.2	3.2
	s.d.	0.4	1.0	3.1	3.0	1.8
South Africa	mean	8.4	7.2	7.4	7.4	5.4
	s.d.	2.3	3.1	1.9	1.9	3.6
South Korea	mean	5.6	8.8	8.4	6.6	3.0
	s.d.	1.7	1.1	0.9	1.1	1.6
Sweden	mean	7.6	2.0	9.2	6.4	2.2
	s.d.	2.1	2.2	1.3	4.1	1.1
Switzerland	mean	8.2	2.8	4.0	6.2	2.4
	s.d.	4.0	2.7	3.7	2.6	1.5
Thailand	mean	9.8	1.0	9.8	7.4	7.6
	s.d.	0.4	0.0	0.4	3.2	3.6
United Kingdom	mean	9.2	5.8	9.0	9.6	6.8
	s.d.	1.8	3.3	1.0	0.5	1.9

Table 3.5 Presentation of the policy-making process (1=bad 10=good)

		The section devoted to presenting how policy decisions are made:					
		Length (pages)	Time to read (minutes)	Provides efficient summary	Conveys rationale of policy decisions	Deals with objections	Generally convincing
Australia	mean	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	s.d.		n.a.	n.a.	n.a.	n.a.	n.a.
Brazil	mean	34.3	48.8	8.3	7.5	5.3	7.5
	s.d.		7.5	3.5	3.0	3.4	1.9
Canada	mean	1.0	3.6	5.2	5.6	1.0	4.8
	s.d.		2.3	1.6	1.1	0.0	0.8
Chile	mean	4.0	12.8	5.5	3.0	1.0	4.5
	s.d.		2.2	3.4	1.8	0.0	2.6
Czech Republic	mean	6.0	14.4	7.0	7.4	5.0	6.8
	s.d.		1.3	0.7	1.1	2.0	0.8
Hungary	mean	2.0	6.3	6.0	5.7	1.0	5.3
	s.d.		3.2	1.0	2.1	0.0	1.5
Iceland	mean	3.8	8.8	7.0	7.5	1.3	6.8
	s.d.		3.0	0.8	1.0	0.5	1.0
Israel	mean	7.4	21.0	8.0	8.0	1.2	7.2
	s.d.		8.9	1.2	0.7	0.4	0.8
Mexico	mean	5.0	8.7	6.3	7.7	1.0	6.0
	s.d.		2.9	2.5	1.2	0.0	1.7
New Zealand	mean	3.8	7.8	6.8	7.0	1.0	6.6
	s.d.		0.8	2.3	3.4	0.0	2.8
Norway	mean	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	s.d.		n.a.	n.a.	n.a.	n.a.	n.a.
Peru	mean	5.0	10.5	5.5	5.5	1.3	5.0
	s.d.		6.7	3.0	3.3	0.5	2.6
Philippines	mean	6.0	14.3	7.7	7.0	1.7	6.7
	s.d.		9.3	1.2	2.0	1.2	2.5
Poland	mean	2.0	4.4	5.4	4.6	1.0	4.6
	s.d.		2.2	3.3	3.4	0.0	2.7
South Africa	mean	4.5	9.0	8.3	8.0	2.0	7.3
	s.d.		1.0	0.6	1.0	1.7	0.6
South Korea	mean	4.0	5.4	4.8	5.4	1.0	5.0
	s.d.		1.7	1.9	1.5	0.0	1.6
Sweden	mean	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	s.d.		n.a.	n.a.	n.a.	n.a.	n.a.
Switzerland	mean	1.7	5.0	7.3	6.0	1.0	6.3
	s.d.		1.7	1.5	0.0	0.0	1.2
Thailand	mean	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	s.d.		n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom	mean	4.0	12.3	9.3	9.0	5.8	8.8
	s.d.		3.9	1.5	0.8	3.8	1.0

quantity move in tandem. But the regression indicates that adding more information does not result in an equal increase of quality, suggesting declining returns to packing in information.

3.5 The decision process

Many readers will not have the time or interest to read through the entire report. One task of an IR is to make it easy to quickly find the information of interest. This creates a trade-off between length and ease of use. This section looks at the decision process, that is, who decides what, when and how.

The evidence presented in Table 3.4 shows how easy it is to understand the broad process of decision-making. In general, (first-time) readers can relatively easily understand who decides and what the policy objectives are.[18] The timing of the decision is often difficult to gather from IRs. Nor do IRs always make it easy for readers to understand how policy decisions are related to the mass of information provided.

As shown in Table 3.5, most but not all IRs include a section that presents how policy is decided (the exceptions are Australia, Norway, Sweden and Thailand). These sections are typically short (5-6 pages) and can be quickly read, which receives high marks; the exception being the Brazilian report. In general the IRs provide efficient summaries of the process and the rationale of decisions, and they are seen as quite convincing. But they typically offer little discussion of the objections that can be raised to the decision.

3.6 Inflation forecasts

A key aspect of IT concerns the way the inflation forecast is prepared and used. To start with, Table 3.6 looks at the presentation of the inflation forecasts. Nearly all IRs (19 out of 20) report an inflation forecast, and half use the fan chart approach to communicate uncertainty of these forecasts. The horizon varies from one year to two years, with two countries (New Zealand and Switzerland) extending their forecasts to three years.[19] This indicates that IRs are indeed used as a companion tool to IT, with the puzzling exception of Poland, which does not report its forecasts.

A necessary condition for effective IT is that the forecasts be reliable and perceived as such. Over time, an IT central bank builds its track record. While it could leave to observers to assess the quality of the inflation forecasts, an IT central bank can hardly avoid reporting, and explaining its record. One approach is to compare the central bank's own forecast with those published by others (public and/or private institutions). This is done by only 11 of the 20 central banks in our sample. Another complementary approach is to document past forecast errors, which is done by eight central banks.

Even if IT central banks rely only on inflation forecasts to make policy decisions, they cannot overlook other macroeconomic developments. At least, they must indicate how they perceive the implications of their decisions on key variables. In several cases, as previously noted, they apply IT in a flexible manner, for example by scaling their actions to take these implications into account. For these reasons, it is important to know the central bank's view on macroeconomic developments. The last three columns of Table 3.6 deal with this question. Almost all the central banks that provide inflation forecasts also show their forecast of GDP growth. A minority only (five) also report forecasts of unemployment. The last column indicates whether other forecasts are also presented, a '1' indicating that this is the case for a wide and diverse array of variables. In some cases, a more precise succinct characterization is possible and reported. The table shows that such forecasts are not reported by five central banks, one of which does not report the inflation forecast anyway. Several central banks emphasize the external sector (current accounts, foreign developments).

How are these forecasts generated? Although most readers will not be interested in the details of the forecasting procedure, professional economists will want to understand the theoretical assumptions (the model) and ancillary assumptions used in the exercise. Table 3.7 shows that only two central banks report a formal model. With one exception, all central banks present their procedures informally.

Turning to the assumptions that underlie the forecasts, a key question is what is assumed about the interest rate. This is a vexing question for there is no obvious best solution. Assuming that the currently chosen interest rate will remain constant is obviously disingenuous over most forecasting horizons. As noted by Svensson (2001), if the inflation forecast is away from the target, the IT central bank is in effect committed to change the interest rate at some point. Most central banks argue that they do not form a view of what the interest rate will be in the future, so that an assumption of a constant interest rate is the only possibility, even if it is inconsistent. According to the reports, this is the solution chosen by 11 of the 20 central banks under review. Two central banks use market rates and six do not provide any indication.

18 Norway seems to be an exception, although with large differences of appreciation among the readers.

19 In some cases, the horizon is not presented clearly, so our readers presented different assessments and the table reports the average.

Table 3.6 Inflation forecasts (except for column 'Horizon' 1=yes 0=no)

	Inflation forecasts			Forecast errors		Other forecasts provided		
	Shown	Fan?	Horizon (months)(a)	Compared to others	Data on past errors	GDP growth	Unemployment	Others
Australia	1	0	16	1	0	1	0	0
Brazil	1	1	14	1	1	1	0	current account
Canada	1	0	13	0	0	1	0	1
Chile	1	1	24	1	0	1	0	1
Czech Republic	1	0	18	0	1	1	0	1
Hungary	1	1	17	1	1	1	0	1
Iceland	1	1	24	1	1	1	1	1
Israel	1	0(b)	14	1	0	1	1	current account
Mexico	1	0	12	1	0	1	0	1
New Zealand	1	0	36	1	1	1	1	1
Norway	1	1	25	1	1	1	1	1
Peru	1	1	19	0	0	1	0	1
Philippines	1	0	12	1	0	1	0	0
Poland	0	0	12	0	0	0	0	0
South Africa	1	1	15	0	0	0	0	0
South Korea	1	1	10	0	0	1	0	0
Sweden	1	1	24	0	1	1	1	labour market
Switzerland	1	0	16	0	0	1	0	1
Thailand	1	1	24	1	0	1	0	1
United Kingdom	1	1	24	0	1	1	0	1

Notes: (a) This is the horizon as of the time of publication of the IR. It may be shorter than the forecast horizon when the forecast has been prepared earlier. (b) The Bank of Israel does not report a fan chart in the IR examined, but this appears to be an exception.

Table 3.7 Presentation of the underpinnings of inflation forecasts (1=yes 0=no)

			Assumptions underlying forecasts				
			Interest rate		Exchange rate		
	Explicit model	Informal arguments	Constant	Other	UIP	PPP	Other
Australia	0	1	n.a.	n.a.	n.a.	n.a.	n.a.
Brazil	1	1	0	market expect.	0	0	constant
Canada	0	1	0	n.a.(a)	n.a.	n.a.	n.a.
Chile	0	1	1	0	0	0	real ex. rate path
Czech Republic	0	1	0	1	1	0	0
Hungary	0	1	1	0	0	0	constant
Iceland	0	1	1	0	0	0	constant
Israel	0	1	n.a.	n.a.	n.a.	n.a.	n.a.
Mexico	0	1	n.a.	n.a.	n.a.	n.a.	n.a.
New Zealand	0	1	0	1	0	0	return to equilib.
Norway	0	1	1	0	0	0	constant(b)
Peru	0	1	1	0	n.a.	n.a.	n.a.
Philippines	0	1	1	0	0	1	0
Poland	0	1	n.a.	n.a.	n.a.	n.a.	n.a.
South Africa	0	1	1(c)	0	n.a.	n.a.	n.a.
South Korea	0	1	1	0	n.a.	n.a.	n.a.
Sweden	0	1	1	alternative	0	0	assumed path
Switzerland	0	1	1	0	n.a.	n.a.	n.a.
Thailand	1	1	1	0	0	0	endogenous
United Kingdom	0	1	1	1	n.a.	n.a.	n.a.

Notes: (a) The Bank of Canada projects internally, but does not publish, the interest-rate path that would bring inflation to its target midpoint. (b) The IR presents two alternative exchange rate scenarios, one that assumes UIP and the other derived from market expectations. (c) The South African Reserve Bank assumes a constant repo rate over the forecast period, an information unintentionally omitted in the October 2002 IR.

Table 3.8 Executive summaries: size and readability (understandable by: 1=yes 0=no)

			Understandable by							
			Economists only			Non-economists				
	Length (pages)	Time to read (minutes)	PhDs only	Graduates only	Undergraduates	Highly educated	Educated	Non-educated	Journalists	Politicians
Australia	4.0	8.4	0.0	0.0	1.0	1.0	0.8	0.0	1.0	1.0
Brazil	3.0	6.2	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0
Canada	4.0	7.8	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0
Chile	6.0	14.2	0.0	0.2	0.8	1.0	0.8	0.0	1.0	1.0
Czech Republic	2.0	4.4	0.0	0.2	0.8	1.0	0.8	0.0	1.0	1.0
Hungary	1.2	3.2	0.0	0.0	1.0	1.0	0.8	0.0	1.0	1.0
Iceland	2.0	5.6	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0
Israel	2.0	6.8	0.0	0.2	0.8	1.0	1.0	0.0	1.0	1.0
Mexico	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
New Zealand	1.0	1.7	0.0	0.0	1.0	1.0	0.7	0.0	1.0	1.0
Norway	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Peru	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Philippines	1.0	1.7	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0
Poland	5.0	10.4	0.0	0.2	0.8	1.0	1.0	0.0	1.0	0.8
South Africa	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
South Korea	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sweden	2.0	6.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0
Switzerland	1.6	4.0	0.0	0.2	0.8	1.0	1.0	0.0	1.0	1.0
Thailand	6.0	10.5	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0
United Kingdom	3.0	9.4	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0

Table 3.9 Quality of the executive summary (1=bad 10=good)

		Effective summary	Conveys rationale of policy decisions	Deals with objections	Generally convincing
Australia	mean	5.4	4.0	1.0	4.8
	s.d.	1.8	2.8	0.0	1.8
Brazil	mean	7.0	4.2	1.0	5.6
	s.d.	1.4	3.0	0.0	1.1
Canada	mean	8.4	8.2	1.0	7.8
	s.d.	0.9	0.4	0.0	0.8
Chile	mean	7.8	5.6	1.0	6.6
	s.d.	0.8	3.0	0.0	0.5
Czech Republic	mean	7.8	5.6	1.0	6.8
	s.d.	1.8	2.1	0.0	1.3
Hungary	mean	5.8	5.0	1.0	4.6
	s.d.	1.3	2.0	0.0	1.1
Iceland	mean	8.0	8.6	1.2	7.8
	s.d.	1.0	1.1	0.4	0.8
Israel	mean	6.8	7.2	1.2	6.6
	s.d.	1.1	0.4	0.4	1.1
Mexico	mean	n.a.	n.a.	n.a.	n.a.
	s.d.	n.a.	n.a.	n.a.	n.a.
New Zealand	mean	7.3	6.0	1.0	6.0
	s.d.	1.5	3.6	0.0	2.0
Norway	mean	n.a.	n.a.	n.a.	n.a.
	s.d.	n.a.	n.a.	n.a.	n.a.
Peru	mean	n.a.	n.a.	n.a.	n.a.
	s.d.	n.a.	n.a.	n.a.	n.a.
Philippines	mean	6.3	5.3	1.0	5.7
	s.d.	2.3	1.5	0.0	1.2
Poland	mean	6.4	4.2	1.0	5.2
	s.d.	1.7	1.8	0.0	0.8
South Africa	mean	n.a.	n.a.	n.a.	n.a.
	s.d.	n.a.	n.a.	n.a.	n.a.
South Korea	mean	n.a.	n.a.	n.a.	n.a.
	s.d.	n.a.	n.a.	n.a.	n.a.
Sweden	mean	7.8	5.5	1.0	6.0
	s.d.	1.0	3.0	0.0	2.2
Switzerland	mean	6.8	6.6	1.0	6.8
	s.d.	0.8	1.1	0.0	1.1
Thailand	mean	8.0	7.0	1.0	7.0
	s.d.	1.8	1.4	0.0	1.8
United Kingdom	mean	9.6	8.8	2.0	8.0
	s.d.	0.9	1.1	2.2	0.7

Table 3.10 Overall assessment (1=bad 10=good)

		Convincing	Banks' expertise	Completeness of report	Writing style	Information provided	Not intimidating to	
							economists	non-economists
Australia	mean	4.4	4.4	3.2	7.6	4.2	8.2	7.0
	var	1.7	2.7	1.3	1.7	1.3	2.5	2.3
Brazil	mean	7.4	8.4	8.4	6.8	8.2	7.4	4.0
	var	1.7	0.9	1.1	1.1	0.4	1.3	1.9
Canada	mean	5.4	5.0	4.4	9.0	5.4	9.8	7.0
	var	1.3	1.0	1.1	0.7	0.9	0.4	1.9
Chile	mean	7.2	7.6	7.2	7.8	7.8	9.2	6.2
	var	0.8	1.3	0.8	1.3	0.4	0.0	0.5
Czech Republic	mean	7.2	7.4	7.2	7.6	8.0	6.4	4.8
	var	0.4	0.5	1.3	1.1	1.0	0.8	1.8
Hungary	mean	5.0	7.0	5.2	5.6	5.6	8.0	4.8
	var	3.2	1.4	2.2	2.3	2.3	1.0	2.0
Iceland	mean	7.8	7.0	7.2	7.4	7.6	8.8	5.8
	var	0.8	1.6	0.8	1.5	1.1	0.5	2.7
Israel	mean	6.6	6.2	5.0	7.4	5.6	8.8	5.8
	var	2.3	0.8	1.4	0.9	1.9	1.1	1.9
Mexico	mean	5.2	4.6	5.6	8.2	5.0	8.6	6.8
	var	2.9	1.7	2.7	0.4	2.2	0.5	1.6
New Zealand	mean	8.4	7.6	7.6	9.2	8.4	9.6	7.4
	var	0.5	1.3	0.5	0.8	0.5	0.5	1.9
Norway	mean	6.8	7.0	5.6	7.6	7.2	7.6	5.0
	var	1.1	1.7	1.5	0.9	0.4	1.5	2.3
Peru	mean	4.0	2.4	3.6	5.4	4.4	9.0	7.4
	var	2.3	1.5	1.8	1.7	2.7	1.4	1.9
Philippines	mean	6.0	6.4	6.2	6.8	6.0	9.6	7.6
	var	2.0	1.5	1.3	0.8	1.6	0.5	1.1
Poland	mean	5.2	5.8	4.2	7.0	5.8	7.6	4.6
	var	2.3	2.4	1.1	1.0	1.3	1.3	2.1
South Africa	mean	5.8	4.6	4.6	7.0	5.2	9.2	7.8
	var	0.8	0.9	1.3	0.7	1.3	1.1	1.6
South Korea	mean	6.4	6.2	5.8	7.8	6.4	9.2	7.6
	var	0.5	1.1	0.8	0.4	0.5	0.4	1.1
Sweden	mean	7.0	6.8	5.6	7.6	7.2	8.4	5.2
	var	1.7	1.3	1.9	1.1	1.3	1.7	2.6
Switzerland	mean	5.8	5.4	4.0	8.2	4.8	9.0	6.4
	var	1.3	1.7	2.3	1.1	2.8	0.7	1.1
Thailand	mean	7.6	8.2	7.8	7.0	7.6	8.6	5.8
	var	1.3	1.1	1.3	1.2	0.9	1.1	1.3
United Kingdom	mean	9.2	8.8	8.9	10.0	9.2	9.1	6.3
	var	0.4	1.6	0.2	0.0	0.4	0.7	0.8

A similarly vexing issue concerns the assumption about the exchange rate over the forecasting horizon. The future behavior of the exchange rate is obviously related to monetary policy, so that the same issue of consistency arises as in the case with the interest rate. The link from the interest rate to the exchange rate is usually impossible to predict, however, in part because it depends on interest rate developments elsewhere and, more generally, because we simply don't know how to forecast exchange rates. Unsurprisingly, therefore, 10 central banks do not identify the exchange rate assumption that goes into their inflation forecast at all. Several of these probably do account for exchange rates but that they assume as constant exchange rate, in the same way as four central banks which explicitly report this assumption. Two countries (Chile and New Zealand) present the expected path and two (the Philippines and Thailand) use explicit exchange-rate equations in their forecasting models.

For both the interest and the exchange rate, there is probably no ideal solution. But some assumptions must be made, which should not be innocuous since all the IT central banks belong to open-economy countries. Some assumption is better than none, and it is quite discomforting to observe that many central banks remain silent on the issue.

3.7 The executive summary

Most IRs are long and their detailed reading is time-consuming. Few specialists typically read every word with great care but the overwhelming majority of readers are likely to take a quick glance and try to extract some limited information. The usual response is the inclusion of an executive summary. With four exceptions, all central banks in the sample do so. Table 3.8 shows that these summaries are short, from one to six pages in length, and can be typically read in seven minutes.

Two questions arise: whether the summaries can be easily understood by the non-specialists and whether they succeed in conveying the essential information. Table 3.8 provides some answers to the first question. While ideally we would have liked to poll readers with diverse knowledge of economics, here we have to rely on an evaluation by our five well-trained readers. Clearly, all trained economists can read and understand the executive summaries. For non-economists, according to our readers, some higher education, such as a university degree, is needed. Finally, two crucial constituencies are journalists and politicians. Our evaluators consider that the executive summaries are accessible to these categories of readers.

The second question is examined in Table 3.9. Executive summaries usually get high marks – sometimes very high marks – for being effective. They are generally seen as conveying the rationale of policy decisions well and they are often convincing. The only let down concerns efforts in dealing with objections (Table 3.5).

3.8 Overall assessment

Finally, a broad assessment of the IRs' quality is presented in Table 3.10. Are the reports generally convincing? With few exceptions, they are, some highly so, with a small number of poor results. Next, in many ways the reports must display the central bank's expertise in discharging its mandated tasks. Most IRs achieve that aim. The performance in terms of completeness (does the reader find all the answers to the questions that come to mind?) is slightly less satisfactory on average, mostly because some central banks perform less well on this dimension.

As already noted, this could be due to a conscious decision by some banks not to include all information that is pertinent to monetary policy decisions in the IR but to spread it over different publications. Furthermore, to the extent that some important information is published only once per year, our ranking does not capture the total amount of information provided by the bank.[20]

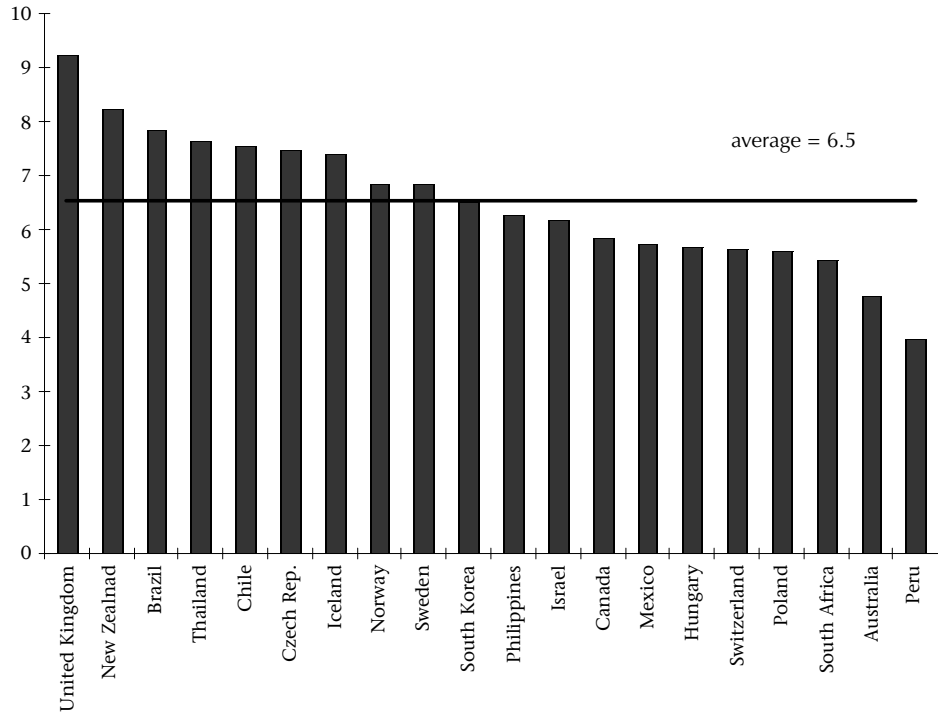
A related question concerns the quality of the information provided by the IRs. Here again the average performance is good, with some high marks and a limited number of failures. The writing style, which matters because it shows whether the message of the report is conveyed clearly, is also generally found to be of good to high quality with few exceptions (which may be related to the translation into English).

Finally, does the report turn off readers by being intimidating? Our results suggest that professional economists will be very much at ease with all the reports, and non-economists should generally not be deterred either.

Averaging over the first five characteristics provides a rough measure of the overall quality of reports. The results are shown in Figure 3.3. They mirror most of the detailed performance results presented earlier. The Bank of England's Inflation Report, the oldest IR, which has inspired many other central banks, remains the model in virtually every dimension. The Reserve Bank of New Zealand has pioneered IT and its Monetary Policy Statement comes next. The Bank of Chile is another central bank with a long tradition of IT according to Mishkin and

20 See footnote 13.

Figure 3.3 Overall assessment (1=bad 10=good)



Note: Unweighted average of ratings shown in Table 3.10.

Table 3.11 Correlation of overall ratings

	Banks' expertise	Completeness of report	Not intimidating to economists	Not intimidating to non-economists	Writing style	Information provided
Convincing	0.862	0.892	0.550	0.936	0.129	-0.188
Banks' expertise		0.870	0.320	0.897	-0.163	-0.488
Completeness of report			0.339	0.930	0.044	-0.228
Not intimidating: economists			0.406	-0.025		0.826
Not intimidating: non-economists			0.232	-0.321		
Writing style				0.404		

Schmidt-Hebbel (2001) (although formal IT is more recent), and its Monetary Policy Report ranks high as well. Some more recent adopters of IT, the Bank of Brazil, the Bank of Thailand, the Czech National Bank and the Central Bank of Iceland, also score high in our ratings, suggesting that the methodology of IR is spreading.

At the lower end comes Peru, clearly an outlier. The IR evaluated here is the first ever published by the Central Bank of Peru soon after it adopted IT. It is designed to be a continuation of previous documents issued by the bank before IT. It must also be noted that, like Mexico, Peru pursues a different approach, not using the interest rate as an instrument, but rather a credit aggregate (banking reserves), which may have affected the evaluators' perceptions.

More surprising is the disappointing performance of two veteran and highly reputed IT central banks, Australia and Canada. In both, much information is provided through other means, including the websites. A fair conclusion could be that these central banks do not consider that their IRs should be an exhaustive document. Finally, it should be noted that the Swiss National Bank does not consider itself an inflation-targeter (see footnote 11) and does not publish a full-blown IR.

In general, central banks that do well on one dimension do well on the others. Table 3.11 reports the correlations of ratings displayed in Table 3.10. Correlation is indeed very high (almost 0.9) among four attributes: persuasiveness, display of expertise, completeness and adequacy of information provided. Interestingly, the correlation is negative between these four attributes, especially display of expertise, and how accessible the IR is to non-economists. This result suggests a trade-off, which may force central banks to decide what the main aim of IRs is. It may be that the IRs should not be seen as the main vehicle to address the broader public and that central banks ought to devote separate efforts – as many actually do – to reach this key constituency while making the IR the vehicle of choice to communicate with the economist profession.

3.9 Announcement of policy decisions

Table 3.12 provides information on how policy decisions are released by the IT central banks. The most frequently used approach, chosen by 13 central banks, is to issue a press release. These releases are likely to be a shortened version of the IR's executive summary and are unlikely to reach the broader public directly although, evidently, the aim is to work through the media. This is in fact how IRs most likely reach the broad public. The remaining central banks hold a press conference, with one (the Central Bank of Norway) doing both.

In most central banks, the members of the MPC and the governor spend much time travelling and giving speeches. The audiences are usually drawn from interested groups (bankers, businessmen, politicians). Television is the natural medium to reach the broad public but interviews of officials are typically rare, mostly limited to circumstances when monetary policy reaches front-page interest. While this is crucial, it leaves out the education process that IRs fulfil for more specialized audiences.

Table 3.12 Public announcement of policy decisions

Australia	Canada	Chile	Colombia	Czech Republic	Hungary	Iceland
Press release	Press release	Press release	Press release	Press conference	Press release	Press release

Israel	Mexico	New Zealand	Norway	Peru	Philippines	Poland
Press release	Release on internet	Speech given by Governor	Press release and conference	Press release	Press release and 'Highlights of the Meeting of the Monetary Board on Monetary Policy Issues'	Press conference

South Africa	South Korea	Sweden	Switzerland	Thailand	United Kingdom
Press conference and Monetary Policy Statement	Press conference	Press release	Two press conferences per year and quarterly internet and press releases	Press conference	Press release

4 Monetary Policy Surprises and the Quality of Inflation Reports: an Empirical Evaluation

The purpose of this section is to investigate whether the predictability of monetary policy is systematically related to the measures of the quality of IRs that we have discussed in previous sections. We construct a measure of the surprise in interest-rate movements associated with the meetings of the MPCs of our set of countries, and attempt to explain the cross-country variation in that measure with selected attributes of their IRs. The basic regression equation we use takes the form

$$SURPRISE_i = \alpha_0 + \sum_{j=1}^{n} \alpha_j CHARACTERISTIC_i^j + \sum_{k=1}^{m} \beta_k CONTROLS_i^k + u_i \quad (1)$$

where *SURPRISE* is our measure of surprise in the financial markets due to monetary policy decisions, and *CHARACTERISTIC* is intended to capture features of IRs that influence market participants' perception of how and by whom monetary policy decisions are taken. *CONTROLS* are variables of a macroeconomic nature that are likely to influence the difficulty of predicting interest-rate changes. Our hypothesis is that variables that increase the transparency of the policy decision process should reduce the surprise element in monetary policy.

To anticipate the main conclusions, we find that the predictability of monetary policy is positively associated with the overall quality of the IR even after controlling for several macroeconomic factors that may influence interest-rate volatility.

4.1 The data

4.1.1 Interest-rate surprises

To construct a measure of monetary policy surprises we proceeded as follows.[21] Let i_t^h denote a market interest rate of horizon *h* at date *t*. Let *t* = *D*, denoting the day an MPC meets to take a decision on whether to increase, decrease or leave unchanged its interest-rate instrument. The change in the market interest from just before to just after the policy announcement can be thought of as consisting of two components, one due to the surprise element in the policy announcement, and one due to other news that regularly arrives in the market. We use daily interest-rate data and therefore the closest we can get to 'just before' and 'just after' is *D* – 1 and *D* + 1 respectively. Hence our measure of surprise in monetary policy will be calculated from

$$\Delta_D^h \equiv i_{D+1}^h - i_{D-1}^h = SURPRISE_D + NEWS\{D-1, D+1\} \quad (2)$$

where *SURPRISE* will be our measure of monetary policy surprise and *NEWS* {D – 1,D + 1} will be a proxy for the interest-rate effects of other news that arrives at the same time. For the interest rate we use market interest rates with 1-, 3- and 12-month horizons.[22] [23] From these we calculated Δ_D^h for each country for all D dates from 1 January

21 In theory, expected interest rates can be retrieved from futures prices. Unfortunately, futures markets do not exist – or are not deep enough – in all our sample countries. Comparability across countries, an absolute requirement, precludes the use of such measures.

22 See the Appendix C for details of the interest rate used for each country. We are grateful to Amund Holmsen of the Bank of Norway for providing the majority of the data.

23 In comments on an earlier draft of the report Lars Heikensten of the Bank of Sweden conjectured that focusing on short-term interest rates may show systematically smaller surprises in countries where a single individual is responsible for the interest-rate decision, compared with countries with a collegial board. He therefore suggested that we also look at surprises in long-term interest rates. We shall attempt to investigate both of these ideas in future work.

2000 until the end of 2002.[24] For each country, we then averaged the absolute values[25] of the changes to create:

- ABS^h = the average absolute values of Δ_D^h
- ABS_POS^h = the average absolute values of Δ_D^h when the policy interest rate is increased
- ABS_NEG^h = the average absolute values of Δ_D^h when the policy interest rate is decreased
- ABS_NO^h = the average absolute values of Δ_D^h when there is no change in the policy interest rate

The choice of sample period was driven by the following considerations. The ratings of the IRs we obtained from the survey refer to the second half of 2002, which argues for measuring interest-rate surprises around the same period. In order to calculate meaningful averages, however, we clearly needed a longer time span. The compromise between these opposing influences determined our choice.

Two countries were excluded from the sample: Iceland, since the monetary policy meetings were not pre-announced, and Mexico for lack of adequate interest-rate data. (The Bank of Mexico does not use an interest rate but a reserve aggregate, the *corto*, as the instrument of monetary policy.) Thus the sample now includes 18 countries.

The cross-country variation in the surprise measures is not very sensitive to the horizon of the interest rate.[26] We therefore chose to focus on the 3-month rate that is available for the largest number of countries. Table 4.1 presents the corresponding data. Two features of the table are worth highlighting. First, the differences across countries are substantial. Of course, this is not necessarily due only to monetary policy surprises, since countries may differ with respect to 'normal' interest-rate volatility, so we will adjust for this possibility (see below). Secondly, the changes in interest rates are systematically larger when there has been a change in the policy interest rate compared with those days when the interest rate was left unchanged. This leads us to focus the rest of our analysis on the overall measure ABS for 3-month interest rates.

Equation (2) emphasizes that changes in the market interest rates at the time of monetary policy meetings are due in part to policy surprises and in part to regular news. Our indicator of the monetary policy surprises is obtained by subtracting the news component $NEWS\{D-1, D+1\}$ from the observed interest-rate change measure ABS. As a proxy for $NEWS\{D-1, D+1\}$, for each country, we use the median of the absolute value of $i_{t+1}^h - i_{t-1}^h$ for all days in the sample period.[27]

Figure 4.1 presents the resulting data ranked according to the size of monetary policy surprises at the time of monetary policy meetings. As implied by Equation (1) these surprises depend not only on the quality of the communication of the central bank but also on the general macroeconomic environment that influences the ability of market participants to predict monetary policy. When these factors are taken into account, we obtain the ranking shown in Figure 4.2.[28] Our hypothesis is that the 'purged' surprises in this latter figure are negatively related to the quality of the IR.

4.1.2 Characteristics of inflation reports

The variables we use to characterize the quality of the information in the IR are based on the survey results discussed above. As we are restricted to a limited number of observations (18), it is necessary to focus primarily on a relatively small number of variables. In addition, as we noted in our discussion of the ratings in Section 2, central banks that do well on one criterion tend to do well on others as well. For these reasons we have taken our core regressors are from the overall assessment reported in Table 3.10. Specifically we use:

- *CONVINCING* (how convincing the report is judged to be);
- *EXPERTISE* (how well the bank's expertise comes through in the report);
- *COMPLETE* (how complete the report is);
- *STYLE* (a measure of how clearly the message of the report is conveyed);[29]
- *INFORMATION* (the amount of information provided in the report).

---

24 Seven exceptions to this time period had to be made. For Chile the starting period is August 2001 to avoid complications associated with the indexation of interest rates before that date. Interbank interest rates in Hungary start only in July 2001, so this is the starting point for our calculations. IT started in January 2002 in the Philippines, in July 2000 in Thailand and in March 2001 in Norway. In Poland the meetings of the MPC were not pre-announced before July 2001.

25 Obviously, we average absolute changes, not actual changes which may be large but average to close to nil.

26 The correlation coefficients between (ABS^1,ABS^3), (ABS^1,ABS^{12}), (ABS^3,ABS^{12}) are .99, .94, and .98 respectively.

27 We prefer the median to the average since it is less sensitive to outliers due to special events. The differences are trivial, anyway.

28 The data in the figure are obtained by using the estimated coefficients on the control variables to purge the surprise variable of the effects of the macroeconomic environment. The estimates are drawn from Equation (6) in Table 4.2.

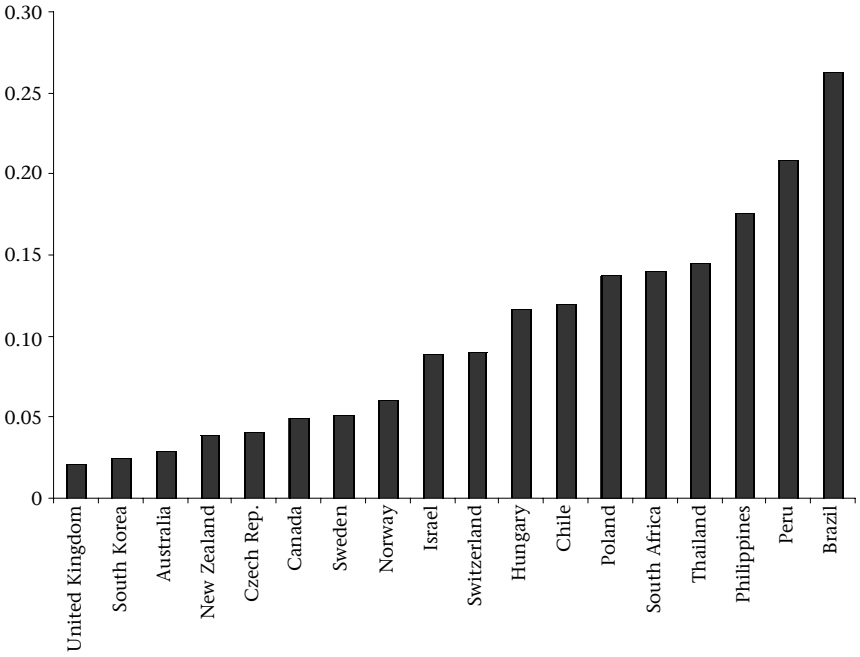
29 Note that this variable measures the clarity of the writing style and not only the grammatical and literary style.

Table 4.1 Changes in 3-month market interest rates associated with monetary policy meetings

	ABS	ABS_POS	ABS_NEG	ABS_NO
Australia	0.049	0.086	0.050	0.037
	32	*6*	*6*	*20*
Brazil	0.462	1.149	0.337	0.295
	38	*7*	*9*	*22*
Canada	0.065	0.011	0.103	0.023
	21	*6*	*10*	*5*
Chile	0.191		0.384	0.075
	16	*0*	*6*	*10*
Czech Republic	0.050	0.000	0.163	0.027
	36	*1*	*6*	*29*
Hungary	0.127	0.320	0.307	0.059
	37	*2*	*9*	*26*
Israel	0.119	0.432	0.086	0.025
	34	*5*	*19*	*10*
New Zealand	0.078	0.069	0.158	0.051
	25	*8*	*5*	*12*
Norway	0.090	0.120	0.270	0.074
	15	*1*	*1*	*13*
Peru	0.366	0.718	0.296	0.172
	11	*3*	*4*	*4*
Philippines	0.364		0.521	0.305
	11	*0*	*3*	*8*
Poland	0.207	0.000	0.224	0.180
	23	*0*	*14*	*9*
South Africa	0.149	0.278	0.529	0.011
	21	*4*	*3*	*14*
South Korea	0.035	0.057	0.160	0.016
	37	*3*	*4*	*30*
Sweden	0.063	0.062	0.239	0.032
	25	*5*	*3*	*17*
Switzerland	0.109	0.033	0.197	0.050
	16	*2*	*6*	*7*
Thailand	0.670	0.000	0.262	0.0738
	21	*0*	*3*	*18*
United Kingdom	0.033	0.037	0.075	0.021
	37	*2*	*7*	*28*
Average	0.179	0.211	0.242	0.122

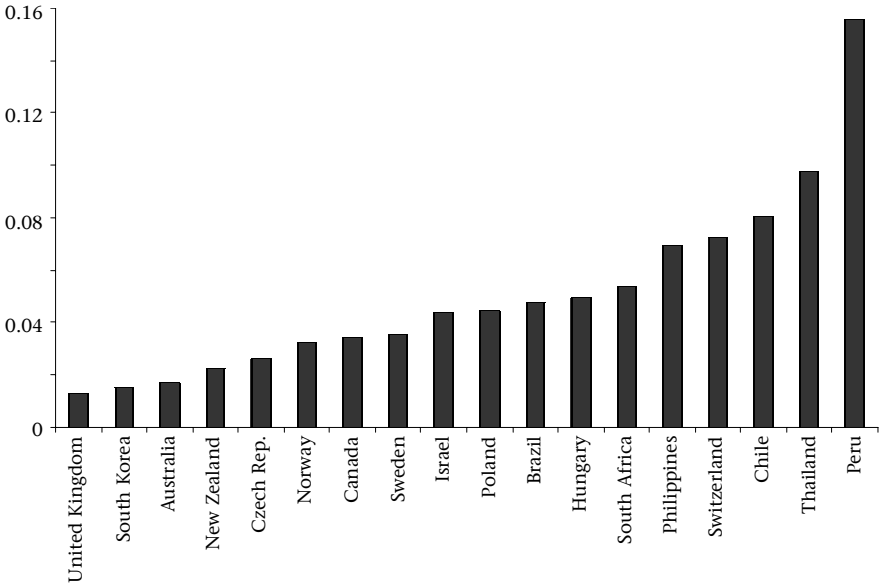
Note: The interest rate changes in the table are measured in percentage points. The number in italics refer to the number of observation in each category.

Figure 4.1 Interest-rate surprises at the time of monetary policy meetings



Source: See text for calculations. Data kindly provided by Norges Bank.

Figure 4.2 Adjusted interest-rate surprises at the time of monetary policy meetings.



Note: The size of the columns in the figure measure interest rate surpises that have been purged of the effects of the control variables *I-LEVEL* and *I-VOLATILE*. The calculations are based on the equation (6) in Table 4.2.

If IRs achieve the aim of improving the predictability of monetary policy, we expect these variables to reduce the interest-rate surprises associated with meetings of MPCs. As already suggested, however, many of the variables are highly correlated with each other, which severely limits the possibility of identifying their separate influences, especially as we work with a small sample of 18 observations. Accordingly we also use *COMBINED*, the unweighted average of these five ratings displayed in Figure 4.3.

4.1.3 Control variables

The predictability of monetary policy is likely to be influenced not only by the clarity of the monetary policy analysis and communication of the central bank, but also by the macroeconomic environment in which the policy decisions are taken. To capture the latter we introduce subsets of the following variables in each regression:

- *I_LEVEL* (the average level of the market interest rate during the sample period);
- *I_VOLATILE* (the median of the absolute value of all two-day changes in interest rates during the sample period);
- *INF_AVG* (the average inflation rate during the sample period);
- *INF_STDEV* (the standard deviation of the inflation rate during the sample).

Each of these measures is expected to render the predictability of monetary policy more difficult and should thus increase the surprise element in interest-rate movements.

4.2 Regression results: quality of the Inflation Reports

The regression results are displayed in Table 4.2. The dependent variable is, as defined in (2), the surprise associated with monetary policy meetings and announcements measured, as explained in Section 4.1.1. Since this variable is positive by definition, we transform it by taking natural logarithms to ensure that the predicted values of the regression equations will also be positive.

The control variables that best capture the macroeconomic environment are the average interest-rate level (*I_LEVEL*) and our measure of interest-rate volatility (*I_VOLATILE*). As noticeable in columns 1 and 2, both have the expected positive effect on interest-rate surprises and are highly significant. We interpret this as evidence that monetary policy decisions are inherently more complex, and therefore more difficult to predict, in a turbulent macroeconomic environment.

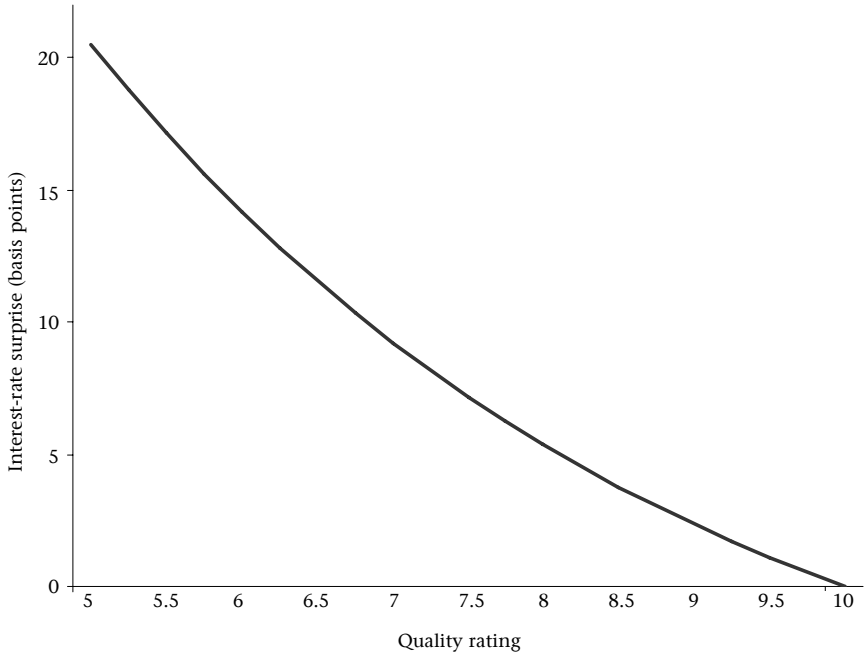
The first five equations in the table show the effects of variables capturing different aspects of the overall assessment of the IR. All of them have the expected negative influence on interest-rate surprises and three of them – how convincing the report is judged to be, how well it reflects the expertise of the staff and the quality of the writing style – are statistically significant at the 95% level or higher. The remaining two, how complete and well informed is the report, deal with less precise questions, corroborate the others, and are significant at the 90% confidence level. The combination of all five ratings, which are highly correlated, is also, significantly, at the 95% confidence level. Taken together, these results strongly support the view that the quality of the IR is associated with reduced uncertainty in financial markets.

Attempts to include more than one IR characteristic simultaneously in the regression proved unsuccessful due to their high mutual correlation. As a consequence, we cannot be more specific about the relative importance of the individual characteristics. All that can be said at this stage is that better reports are associated with smaller surprises in monetary policy. Figure 4.3 gives a sense of the quantitative importance of the quality ratings for the interest-rate surprise. Based on equation (6) in Table 4.2 it shows that an increase in the average rating (*COMBINED*) from 5 to 7.5 leads to a reduction in the interest-rate surprise by 13 basis points, and that a further increase to 10 would lead to an additional reduction of 7 basis points.

We also estimated equations including more specific variables from Table 3.4, capturing information about the policy-making process, or from Table 3.6 about the nature of inflation forecasts. The results were disappointing in that none of these additional variables obtained significant regression coefficients. The negative influence of the core variables remained, however.

Finally, an additional set of regressions were computed using the average inflation rate instead of the level of the interest rate as a control variable. The results for our best specifications were generally less successful in two respects. First and most importantly, both control variables were now less significant and the adjusted R^2 declined. Second, the variables capturing the characteristics of the IR had a less significant effect on interest-rate surprises, although the signs of the corresponding coefficients were still what we hypothesize. The details of these regressions can be found in Appendix B.

Figure 4.3 Reduction in interest-rate surprises due to the quality of the Inflation Report



Note: Calculated using the coefficient on the *COMBINED* variable in equation (6) in Table 4.2.

4.3 Regression results: divergent perceptions of Inflation Reports

Another way of evaluating IRs is to ask whether they reach different audiences equally well. A number of questions deal directly with this aspect: see Tables 3.8 and 3.10, which look at the background and profession of readers. Another question is whether different people have different perceptions of IRs. If so, this could be due to variations in mind-sets, as each individual has their own way of absorbing what they read. It could also be due to intended or unintended fuzziness in the IR, ambiguities that result in varying interpretations.

A desirable feature of IRs is that they should be structured and written in a way that removes diverse interpretations. It may be the case that the MPC itself is in more than one mind on a particular issue and does not wish to make it explicit for fear of suggesting deeper disagreements than is actually the case. The proper response, however, should not be diplomatic ambiguity but a clear statement of the debate and an indication of how serious the disagreements are. Early on, outside observers may draw excessive conclusions, but over time they will learn and reach more sober conclusions.[30] All in all, intended or unintended fuzziness is likely to reduce transparency and to make policy actions less predictable. We now test this conjecture.

As is clear from several previous tables, our five evaluators did not answer the questions put to them with identical ratings. For each evaluation question and for each IR, we can observe how they disagree among themselves. The corresponding standard deviation of the ratings can be seen as revealing intended or unintended fuzziness. This idea is exploited in Table 4.3, which replaces the quality ratings shown in Table 4.2 with their standard deviations across the five evaluators. We also show the standard deviation concerning the important question of the quality of the IR in presenting how the MPC evaluates the risks involved in its policy choices; see Table 3.3.[31] The average standard deviation over the six criteria is displayed in Figure 4.4, which can be interpreted as an indication of the IRs' fuzziness.

Our conjecture is confirmed. The quality rating and the standard deviations are often significantly negatively correlated with the quality rating. Central banks that achieve high average ratings tend to do so quite unanimously, while poor ratings are more controversial. Crucially, the results shown in Table 4.3 indicate that the interest rate

30 This learning process has been visible following the release of the minutes of MPC meetings by the Bank of England.

31 Needless to say, the small number of evaluators should be kept in mind when assessing these results.

Table 4.2 Determinants of surprises in monetary policy: quality of the Inflation Report

	col. 1	col. 2	col. 3	col. 4	col. 5	col. 6	col. 7	col. 8	
			OVERALL ASSESSMENT						
Equation no.	*I_LEVEL*	*I_VOLATILE*	*CONVINCING*	*EXPERTISE*	*COMPLETE*	*INFORMATION*	*STYLE*	*COMBINED*	R2-adj
1	0.08	3.12	-0.22						0.55
	4.18	*4.56*	*-2.12*						
2	0.10	3.28		-0.19					0.55
	5.10	*5.29*		*-2.34*					
3	0.10	3.55			-0.18				0.53
	4.55	*3.99*			*-1.84*				
4	0.09	3.16				-0.19			0.53
	4.67	*4.03*				*-1.85*			
5	0.05	1.91					-0.35		0.63
	2.74	*2.86*					*-5.05*		
6	0.09	3.18						-0.25	0.58
	4.82	*4.85*						*-2.46*	

Sources: The dependent variable in each regression is the natural logarithm of the variable *SURPRISE* as defined in the text.The right-hand side variables are presented in Table 3.10; the combined measure is displayed in Figure 3.3.
Notes: The constant is not reported. All regressions are pure cross-sections with 18 observations. *t*-values (in italics) have been calculated using standard errors corrected for possible heteroscedastitity using the White procedure. The regressions were computed in Eviews 4.0.

Table 4.3 Determinants of surprises in monetary policy: divergent perceptions of Inflation Reports

	col. 1	col. 2	col. 3	col. 4	col. 5	col. 6	col. 7	col. 8	
			STANDARD DEVIATIONS OF:						
Equation num-	*I_LEVEL*	*I_VOLATILE*	*CONVINCING*	*EXPERTISE*	*COMPLETE*	*INFORMATION*	*STYLE*	*RISK*	R2-adj
1	0.06	2.57	0.39						0.54
	2.24	*3.43*	*2.36*						
2	0.08	2.77		-0.08					0.37
	3.01	*2.77*		*-0.34*					
3	0.09	2.80			0.66				0.62
	4.24	*3.39*			*3.54*				
4	0.10	2.92				0.50			0.66
	5.17	*5.08*				*3.28*			
5	0.09	2.51					0.53		0.51
	3.47	*2.87*					*1.85*		
6	0.06	1.89						0.82	0.63
	3.13	*2.95*						*3.42*	

Sources: The dependent variable in each regression is the natural logarithm of the variable *SURPRISE* as defined in the text.The right-hand side variables are the standard deviations of across the evaluators' ratings presented in Table 3.10 for the first five columns and of the quality rating on risk assessment presented in Table 3.3.
Notes: The constant is not reported. All regressions are pure cross-sections with 18 observations. *t*-values (in italics) have been calculated using standard errors corrected for possible heteroscedastitity using the White procedure. The regressions were computed in Eviews 4.0.

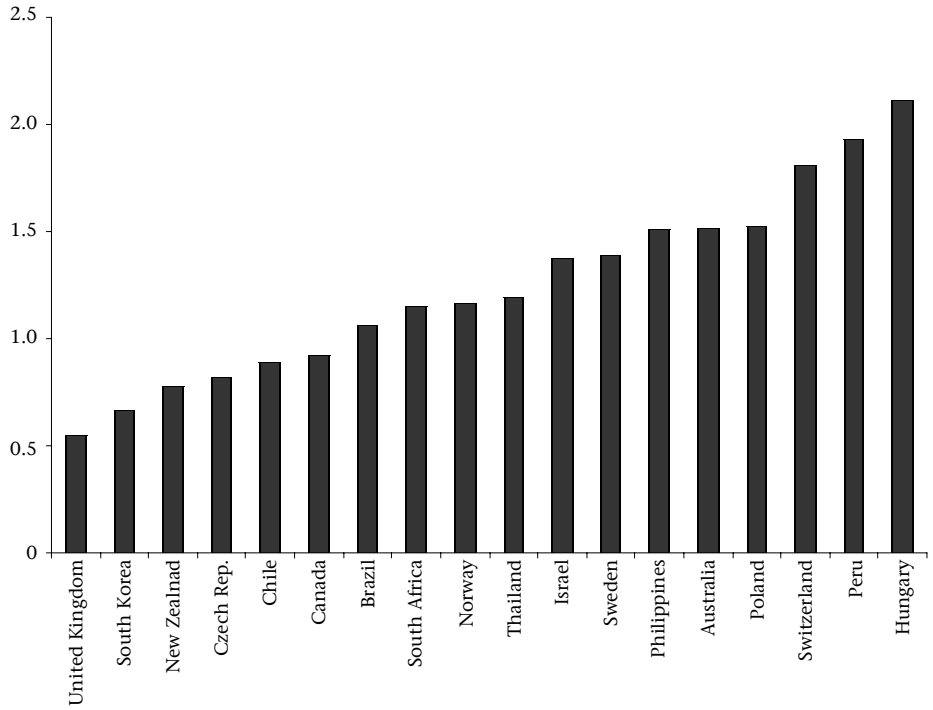
surprise tends to increase with the divergence in perceptions. Indeed, with one exception, which is not statis tically significant, all standard deviations enter with a positive, usually highly significant – at the 95% confidence level – coefficient.

4.4 Interpretation

We have found evidence of a significant statistical link between the quality of the IR, as seen in both the ratings and the degree of agreement among different readers, and central bank transparency measured by the predictability of its decisions. As is well known, however, such a statistical link does not imply causality. The evidence can in fact be interpreted in two ways. It can imply that, indeed, the higher the quality of the IR the better markets are able to foresee the central bank's actions. Alternatively it can mean that good central banks, that is, central banks which have a good professional staff, with high-quality management, and which are fully dedicated to fulfilling its mission, deliver both good and predictable policy and high-quality IRs. Both interpretations are plausible and they are not mutually exclusive. It would be desirable of course to disentangle these two interpretations, but this task is presently impossible for lack of adequate data.[32] At this stage, we can only attempt some conjectures on the basis of the available information.

A comparison of Figures 3.3 and 4.2 is interesting (the correlation is negative but insignificant). We have noted that some reputed central banks (Australia, Canada) achieve a modest overall quality rating, and we now find that their policy actions are among the most predictable ones. This contrast confirms our previous conjecture that some central banks use other means of communication to achieve a high degree of transparency. On the other side, predictability is found to be low for some highly-ranked IRs. This is the case for Chile and Thailand, for instance. These are countries that operate in a rather volatile environment. Although we attempt to control for this effect, it may be that we have not fully purged the surprise measure. Other idiosyncracies may further explain specific observations.[33]

Figure 4.4 Average standard deviations of evaluators ratings



Note: the figure displays the unweighted average of the standard deviations across evaluators of the six ratings used in Table 4.3.

32 The first limitation is the small number of central banks that have adopted IT, which results in too few degrees of freedom to enrich the statistical analysis. A second limitation is that we do not have measures of the quality of central banks, whether they have adopted IT or not.

33 South Korea is a case in point. We have already noted that the high predictability of South Korea's interest rate could be due to the surprisingly smooth pattern of the interest rate.

5 Conclusions

For two main reasons, IT requires from the central bank a high degree of transparency. To credibly commit to the target – regardless of who sets the target – the central bank must have full operational independence, which in turn requires accountability. In addition, monetary policy is more efficient the more the central bank can shape market expectations. Until quite recently, central banks were trying to determine how much information should be made public. Nowadays, central banks must not only provide all the relevant information but also convince the public that they do so. As a consequence, the communication challenge has been deeply transformed. Much as no one can convince others that they are telling the truth, a central bank can never convince the public that it is revealing all that it knows and does. And much as honest people can only keep telling the truth even if they are not believed, a central bank must keep being fully transparent even if scepticism remains. This too is part of a central bank's pedagogical efforts.

IRs provide one mean, among many others, to present the relevant information. Our review of both the principles of monetary policy-making and current practices among IT central banks suggests a number of conclusions. A good IR must cover three questions, in no particular order. First, it must include an analysis of the current situation. This includes output and the labour market (wages and employment), monetary and financial developments, and foreign conditions. Next, it must present a forecast of the inflation rate, along with the associated uncertainty. The inflation forecast is not enough, since policy actions will usually depend on the likely evolution of other key macroeconomic variables such as GDP growth, unemployment, the exchange rate, the current account and, in some countries, the situation in major economic sectors. Thus the IR must also present forecasts, or assumptions, concerning these key macroeconomic variables and an explanation of how these different forecasts logically fit together. The third issue is monetary policy. The IR needs to explain how the MPC interprets current evidence and the forecasts, including present and future uncertainties. Also needed is how the MPC views its past analyses, forecasts and decisions, which may occasionally call for an admission that mistakes were made.

While every central bank ought to strive to achieve the greatest possible transparency and to produce the best possible IR, a legitimate question is whether the IR is an essential component of the bank's overall communication strategy. We have some evidence that this is the case, but at this stage it is a matter of interpretation. Still, the logic is powerful.

As is often pointed out (Svensson, 2003), a key advantage of IT – as flexibly implemented by all central banks – is that it imposes a tight process and reasoning discipline inside the central bank. Simultaneously, we have argued that IT requires a very high degree of transparency. Taken together, these two requirements of IT establish the need for a detailed presentation of the data and procedures that go into the policy decision process. This can only be done through the regular publication of a document, the IR. Put differently, the IR is an inherent part of good monetary policy-making, and its public release is mandated on the grounds of both democratic accountability and policy effectiveness grounds.[34]

One can even go a step further and observe that IT considerably improves the quality of monetary policy-making. Once an IT central bank has improved its internal performance, it becomes fairly easy to share its handling of information and the substance of its MPC's deliberations. Indeed, one result of our investigation of IRs is the high degree of correlation between the various quality ratings. Good central banks do almost everything right, including policy-making and the writing of the IR. In the end, successful IT and publication of a high-quality IR are part and parcel of a virtuous circle.

34 It is interesting to note that the Federal Open Market Committee has long organized its deliberations around the Beige Book. When in the mid-1990s, the FOMC recognized the importance of transparency, it started to release the Beige Book.

Appendix A: List of Inflation Reports used for the evaluation

Bank of Brazil, *Inflation Report*, September 2002
Bank of Canada, *Monetary Policy Report*, October 2002
Bank of Chile, *Monetary Policy Report*, September 2002
Bank of England, *Inflation Report*, August 2002
Bank of Israel, *Inflation Report*, July 2002, no.10
Bank of Korea, *Monetary Policy Report*, September 2002
Bank of Mexico, *Inflation Report* (and *Monetary Program* for 2002), January 2002
Bank of Philippines, *Inflation Report*, Third Quarter 2002
Bank of Sweden, *Inflation Report*, 3rd Quarter 2002, October 2002
Bank of Thailand, *Inflation Report*, October 2002
Central Bank of Iceland, *Monetary Bulletin*, fourth Quarter 2002
Central Bank of Norway, *Inflation Report*, June 2002
Central Reserve Bank of Peru, *Inflation Report*, June 2002
Czech National Bank, *Inflation Report*, July 2002
National Bank of Hungary, *Quarterly Report on Inflation*, August 2002
National Bank of Poland, *Inflation Report*, June 2002
Reserve Bank of Australia, *Statement on Monetary Policy*, November 2002
Reserve Bank of New Zealand, *Monetary Policy Statement*, November 2002
South African Reserve Bank, *Monetary Policy Review*, October 2002
Swiss National Bank, *Quarterly Bulletin*, September 2002

Appendix B: Regression results with average inflation as a control variable

Table B1 Determinants of surprises in monetary policy: robustness checks

	col. 1	col. 2	col. 3	col. 4	col. 5	col. 6	col. 7	col. 8	
			OVERALL ASSESSMENT						
Equation	*INF_AVG*	*I_VOLATILE*	*CONVINCING*	*EXPERTISE*	*COMPLETE*	*INFORMATION*	*STYLE*	*COMBINED*	R2-adj
1	0.14	3.62	-0.16						0.47
	2.52	*3.71*	*-1.33*						
2	0.18	3.91		-0.16					0.51
	4.12	*4.56*		*-1.96*					
3	0.17	4.05			-0.14				0.48
	3.57	*3.78*			*-1.37*				
4	0.16	3.73				-0.15			0.48
	3.34	*3.71*				*-1.36*			
5	0.07	2.28					-0.34		0.57
	1.18	*2.29*					*-4.61*		
6	0.15	3.72						-0.19	0.51
	3.07	*3.95*						*-1.76*	

Sources: The dependent variable in each regression is the natural logarithm of the variable *SURPRISE* as defined in the text.The right-hand side variables are presented in Table 3.10; the combined measure is displayed in Figure 3.3.
Notes: The constant is not reported. All regressions are pure cross-sections with 18 observations. *t*-values (in italics) have been calculated using standard errors corrected for possible heteroscedastitity using the White procedure. The regressions were computed in Eviews 4.0.

Appendix C: Interest-rate data series

The definition of the interest-rate series used in Section 4 are given in Table C1. The inflation rates used in the same section were obtained from the IFS CD-ROM.

Table C1 Interest-rate data

	Interest rate	Sample
Australia	Interbank rates, BBA Libor rates, 1, 3, and 12 months, fixing	03/01/00–31/12/02
Brazil	Swap rates, 1, 3, and 12 months, closing	03/01/00–29/11/02
Canada	Interbank rates, BBA Libor rates, 1, 3, and 12 months, fixing	01/02/00–20/12/02
Chile	Average interest rates of the financial system, 30 to 89 days	09/08/01–20/11/02
Czech Republic	Interbank rates, Pribor, 1, 3, and 12 months, fixing	03/01/00–04/11/02
Hungary	Interbank rates, Bubor, 1, 3, and 12 months	29/06/01–31/12/02
Israel	Interbank rates, Telbor, 1, 3, and 12 months, fixing	03/01/00–01/11/02
New Zealand	Deposit rates, 1, 3, 12, months, closing	03/01/00–02/12/02
Norway	Interbank rates, Nibor, 1, 3, and 12 months, fixing	02/04/01–01/11/02
Peru	Interbank rate, average of very short term rates	02/01/02–31/12/02
Philippines	Interbank rates, Phibor, 1, 3, and 12 months, fixing	01/01/02–04/11/02
Poland	Interbank rates, Wibor, 1, 3, and 12 months, fixing	01/01/01–02/12/02
South Africa	Interbank rates, Safex Jibor, 1, 3, and 12 months, fixing	03/01/00–02/12/02
South Korea	CD rates, 3 months, closing	03/01/00–20/12/02
Sweden	Interbank rates, Stibor, 1, 3, and 12 months, fixing	03/01/00–20/12/02
Switzerland	Interbank rates, BBA Libor, 1, 3, and 12 months, fixing	03/01/00–20/12/02
Thailand	Deposit rates, 1, 3, 12, months, closing	01/07/00–02/12/02
United Kingdom	Interbank rates, BBA Libor rates, 1, 3, and 12 months, fixing	03/01/00–02/12/02

Sources: All data series except those for Chile, Hungary and Peru were provided by the Central Bank of Norway. The data for Chile was provided by the Central Bank of Chile, those for Hungary by the National Bank of Hungary and those for Peru by the Central Bank of Peru.

Bibliography

Andersson, M., H. Dillén and P. Sellin (2001) 'Monetary Policy Signaling and Movements in the Swedish Term Structure of Interest Rates', Working Paper No. 132, Sveriges Riksbank (December).

Bernanke, B.S., T. Laubach, F.S. Mishkin and A.S. Posen (1998) *Inflation Targeting: Lessons from the International Experience*, Princeton, NJ, Princeton University Press.

Blinder, A. (1998) *Central Banking in Theory and Monetary Policy Regimes*, Cambridge, MA, MIT Press.

Blinder, A., C. Goodhart, P. Hildebrand, D. Lipton and C. Wyplosz (2001) 'How Do Central Banks Talk?', *Geneva Report on the World Economy* No. 3, London, Centre for Economic Policy Research.

Brainard, W. (1967) 'Uncertainty and the Effectiveness of Policy', *American Economic Review Papers and Proceedings* 57(2), pp. 411-25.

Gjedrem, S. (2001) 'The Work of Setting Interest Rates', Oslo, Central Bank of Norway.

Kohn, D.L. (2000) 'Report to the Non-Executive Directors of the Court of the Bank of England on Monetary Policy Process and the Work of Monetary Analysis', Federal Reserve Board, 18 October. Reprinted in *Bank of England Quarterly Bulletin* 41, pp. 35-49.

Leiderman, L. and L.E.O. Svensson (eds.) (1995) *Inflation Targets*, London, Centre for Economic Policy Research.

Loayza, N. and R. Soto (eds.) (2001) *Ten Years of Inflation Targeting: Design, Performance, Challenges*, Santiago, Banco Central de Chile.

Mishkin, F. and K. Schmidt-Hebbel (2001) 'One Decade of Inflation Targeting in the World: What Do we Know and What Do We Need to Know', NBER Working Paper No. 8397.

Svensson, L.E.O. (1999) 'Inflation Targeting as a Monetary Policy Rule', *Journal of Monetary Economics* 43, pp. 607-54.

Svensson, L.E.O. (2001) 'Independent Review of the Operation of Monetary Policy in New Zealand: Report to the Minister of Finance', www.princeton.edu/

Svensson, L.E.O. (2002) 'Inflation Targeting: Should It Be Modeled as an Instrument Rule or a Targeting Rule?', *European Economic Review* 46(4-5), pp. 771-80.

Svensson, L.E.O. (2003) 'What Is Wrong with Taylor Rules? Using Judgment in Monetary Policy through Targeting Rules', *Journal of Economic Literature*, forthcoming.

Svensson, L.E.O., K. Houg, A. Berg, H.O. Aa. Solheim and E. Steigum (2002) *An Independent Review of Monetary Policy and Institutions in Norway*, Oslo, Centre for Monetary Economics.