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No. 3188

**HOW TRANSPARENT ARE
CENTRAL BANKS?**

Sylvester C W Eijffinger
and Petra M Geraats

INTERNATIONAL MACROECONOMICS



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ABSTRACT

How Transparent are Central Banks?*

Bank transparency has become the topic of a lively public and debate on monetary policy. Unfortunately, it has been complicated that transparency is a qualitative concept that is hard to measure. We propose a comprehensive index for central bank transparency which covers the political, economic, procedural, policy and operational aspects of central banking. The index is compiled for nine major central banks and is based on an analysis of information disclosure practices and the rich variety in the degree of central bank transparency.

JEL classification: E52 and E58

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1 Introduction

Central bank transparency has become the topic of a lively public and academic debate on monetary policy. The public demands transparency to achieve accountability of central banks that have increasingly become independent. In addition, a burgeoning academic literature analyzes the economic consequences of greater transparency of monetary policy. The debate on transparency has been complicated by the fact that it is a qualitative concept for which few measures exist. This paper proposes a comprehensive index for central bank transparency that comprises the political, economic, procedural, policy and operational aspects of central banking. The index is compiled for nine major central banks and is based on a scrutiny of actual information disclosure. It reveals the various ways in which central banks have become transparent and provides valuable data for the evaluation of the theoretical literature on this issue.

To give a sneak preview of our findings, the most transparent central banks in our sample are the Reserve Bank of New Zealand, the Bank of England and the Swedish Riksbank. The subtop is formed by the Bank of Canada, the European Central Bank and the Federal Reserve. The least transparent central banks are the Reserve Bank of Australia, the Bank of Japan and the Swiss National Bank. Although the most transparent central banks are all inflation targeters, this monetary policy framework appears neither a necessary nor a sufficient condition for transparency.

An important advantage of our transparency index is that it distinguishes various aspects of transparency based on their role in the monetary decision making process. It allows us to identify how central banks differ in their emphasis of various aspects, independent of their monetary policy framework, and how greater transparency manifests itself over time.

There are several other papers that provide useful descriptions of central bank transparency in practice, but none can rival the comprehensive and structured approach underlying our index. Bermanke, Laubach, Mishkin and Posen (1999) provide a well structured description in the form of case studies but focus their analysis on inflation targeting. An elaborate informal discussion and review of central bank transparency is presented by Blinder, Goodhart, Hildebrand, Lipton and Wyplosz (2001). They give a detailed account of transparency at the Federal Reserve, the European Central Bank, the Bank of Japan, the Bank of England and the Reserve Bank of New Zealand, but do not provide objective criteria to measure the degree of transparency.

In their comprehensive survey of 94 central banks, Fry, Julius, Mahadeva,

Roger and Sterne (2000) construct an index of ‘policy explanations’ that consists of three components: (i) explanations of policy decisions, (ii) explanations in forecasts and forward-looking analysis, and (iii) explanations in published assessments and research. Their index captures many transparency issues, but does not highlight the role that different kinds of transparency play in the decision-making process.¹ In addition, their index is constructed using survey responses from central banks, whereas our results stem from an objective, independent analysis of information disclosure practices.

The remainder of the paper is organized as follows. Section 2 discusses a conceptual framework for transparency. Subsequently, we review the theoretical literature on the desirability of central bank transparency in section 3. Then, we present the main contribution of this paper, an index of central bank transparency, in section 4, and discuss how transparent central banks are in section 5. Finally, section 6 concludes.

2 Conceptual Framework For Transparency

Transparency of monetary policy can be defined as the extent to which central banks disclose information that is related to the policymaking process. It is a multifaceted concept that could pertain to any aspect of economic policy-making. Thus, it seems natural to use a conceptual framework for transparency that reflects the different stages of the decision-making process. Following Geraats (2000), one can distinguish five aspects of transparency: political, economic, procedural, policy and operational transparency. Each of these aspects may give rise to different motives for transparency. Their relationship to the policy process is illustrated in figure 1.²

- **Political transparency** refers to openness about policy objectives. This comprises a statement of the *formal objectives* of monetary policy, including an explicit prioritization in case of potentially conflicting goals, and *quantitative targets*. Political transparency is enhanced by *institutional arrangements*, like central bank independence, central bank contracts and explicit override mechanisms, because they ensure that there is no undue influence or political pressure to deviate from stated objectives.³

¹de Haan, Amtenbrink and Eijffinger (1999) provide an index of central bank accountability that includes some elements that pertain to transparency.

²This conceptual framework for transparency could also be applied to other forms of economic policy-making, or decision-making more generally.

³Note that political transparency need not be under control of the central bank, but is often

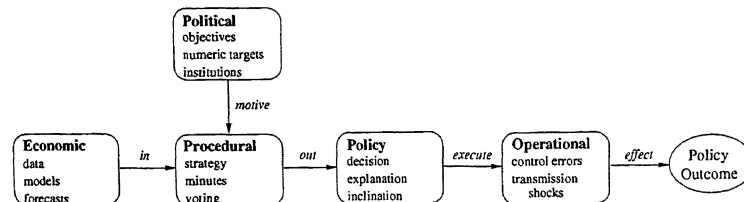


Figure 1: A conceptual framework for transparency.

- **Economic transparency** focuses on the economic information that is used for monetary policy. This includes the *economic data* the central bank uses, the *policy models* it employs to construct economic forecasts or evaluate the impact of its decisions, and the *internal forecasts* the central bank relies on. The latter are particularly important since monetary policy actions are known to take effect only after substantial lags. So, the central bank's actions are likely to reflect anticipated developments.
- **Procedural transparency** is about the way monetary policy decisions are taken. It involves an explicit monetary policy rule or *strategy* that describes the monetary policy framework, and an account of the actual policy deliberations and how the policy decision was reached, which is achieved by the release of *minutes* and *voting records*.
- **Policy transparency** means a *prompt announcement* of policy decisions. In addition, it includes an *explanation* of the decision and a *policy inclination* or indication of likely future policy actions. The latter is relevant because monetary policy actions are typically made in discrete steps; a central bank may be inclined to change the policy instrument, but decide to wait until further evidence warrants moving a full step.
- **Operational transparency** concerns the implementation of the central bank's policy actions. It involves a discussion of *control errors* in achieving the operating targets of monetary policy and (unanticipated) macroeconomic disturbances that affect the *transmission* of monetary policy.

determined by political authorities (government or legislature). For instance, Anglo-Saxon central banks typically do not have goal independence and lack the ability to set their own quantitative targets.

The index for central bank transparency presented in section 4 attempts to quantify each of these five aspects. The concept of transparency is closely related to accountability. In fact, some degree of transparency is a necessary condition for accountability. Whereas transparency refers to mere information disclosure, accountability concerns the explanation of one's actions and the possible repercussions when the policy outcomes fall short of the objectives.

3 Is Central Bank Transparency Desirable?

Although there seems to be an unambiguous trend towards greater transparency in monetary policy, the theoretical literature on the desirability of central bank transparency is less equivocal. Since the motives and consequences of transparency may differ by aspect, we use the conceptual framework described in section 2 to provide an overview of the theoretical findings.⁴

It is useful to illustrate the different aspects of transparency and interpret the theoretical results in the context of a canonical model. Consider a monetary policy game in which the central bank maximizes its objective function

$$W = \alpha (\pi - \pi^*)^2 + \beta (y - y^*)^2 \quad (1)$$

where π is inflation and y is output. In the presence of political transparency, this description of the motives of the central bank is known to the private sector. This includes the targets for inflation and output, π^* and y^* , the preference parameters α and β , the functional forms (in this case quadratic), and possibly other terms that reflect additional objectives or incentive schemes.

The structure of the economy could be represented by the aggregate demand and supply equations

$$y = \bar{y} + a(i - \pi^e - \bar{r}) + d \quad (2)$$

$$\pi = \pi^e + b(y - \bar{y}) + s \quad (3)$$

where i is the nominal interest rate and π^e denote inflation expectations.⁵ The natural rate of output is \bar{y} and the long-run real interest rate equals \bar{r} . In addition,

⁴For a comprehensive survey, see Geraats (2001a). In addition, there are some interesting informal discussions on central bank transparency, see for instance Goodfriend (1986) and Winkler (2000).

⁵The assumptions on the economy reflect the transmission mechanism. Cukierman (2001) provides a comparison of three popular models: neo-monetarist Lucas-type transmission, the neo-Keynesian model with backward-looking pricing, and the new-Keynesian model with forward-looking pricing.

there are aggregate demand shocks d and aggregate supply shocks s . Economic transparency means that the private sector has the same knowledge about the economy as the central bank. This includes both the structure of the economy and the part of the disturbances d and s that are anticipated by the central bank.

Assume that the central bank controls the nominal interest rate i . The central bank could set its policy instrument using a Taylor-type instrument rule, or it could maximize (1) subject to (2) and (3), adopting a Svensson-type targeting framework that allows for judgement. Alternatively, the central bank could use different procedures and formulate its own monetary policy strategy. In the case of procedural transparency, the central bank's strategy and other procedural aspects like minutes and voting records are shared with the private sector.

Policy transparency means that the central bank promptly announces the outcome of its proceedings: the decision about the policy instrument i .

Finally, the implementation of monetary policy could be complicated by control errors for the policy instrument, or transmission disturbances in the form of unanticipated aggregate demand and supply shocks d and s . Operational transparency means that these control errors and transmission disturbances are communicated to the public.

This stylized theoretical framework allows us to summarize the effects of transparency that have been reported in the literature.

3.1 Political Transparency

Formal objectives and quantitative targets are likely to reduce the uncertainty about policymakers' preferences. This could be beneficial. Nolan and Schaling (1996) show that a reduction in uncertainty about the central bank's preference parameter for inflation stabilization α reduces the inflation bias that is present when the target for output exceeds the natural rate ($y^* > \bar{y}$). On the other hand, Eijffinger, Hoerichts and Schaling (2000) find that greater transparency about α could amplify the volatility of output in response to supply shocks s .⁶

Although greater transparency about the inflation and output targets π^* and y^* leads to a beneficial reduction in uncertainty in a static framework, it could be detrimental in a dynamic context when there are other information asymmetries, like economic or operational opacity. Greater preference transparency could increase the inflation bias and give rise to greater output variance (see Geraats

⁶However, these results are sensitive to the specification of uncertainty, as Beetsma and Jensen (2001) point out. When uncertainty is modeled consistently about the relative preference weight on inflation stabilization versus output stimulation, these benefits disappear and preference uncertainty is detrimental.

(2000)). On the other hand, it typically also makes greater transparency in other respects more advantageous.

An added benefit of a quantitative target is that it could induce additional losses to monetary policy makers when the target is missed. In this way, an explicit inflation target π^* could reduce the inflation bias. Interestingly, this even holds for an imperfectly credible target announced by the central bank; Walsh (1999) shows this is actually more desirable than a fixed target because it gives the central bank greater flexibility to respond to economic disturbances.

Institutional arrangements like central bank independence, central bank contracts and explicit override mechanisms also contribute to political transparency because they clarify the relationship between the government and the central bank. The theoretical motivation for central bank independence often refers to the benefits of the appointment of ‘conservative’ central bankers. The seminal paper by Rogoff (1985) shows that central bankers that attach a greater weight to inflation stabilization α than socially optimal, reduce the inflation bias albeit at the cost of greater output fluctuations. The latter side-effect could be overcome by the appointment of central bankers with a conservative inflation target π^* (Svensson 1997), or ‘responsible’ central bankers that do not attempt to stimulate output beyond the natural rate so that $y^* = \bar{y}$ (Blinder 1997).

Central bank contracts could not only provide quantitative targets but also direct penalties for missing them, like fines or dismissal of the central banker. Walsh (1995) shows that central bank contracts could eliminate the inflation bias without compromising output stabilization. However, when there is uncertainty about the central bank’s preferences, Beetsma and Jensen (1998) and Muscatelli (1998) find that the optimal institutional setting in the form of inflation targets and contracts may involve a trade-off between credibility in the form of a reduction of the inflation bias, and flexibility to stabilize output in response to supply shocks. Such a credibility-flexibility trade-off is also present in the optimal override mechanism derived by Lohmann (1992).

3.2 Economic Transparency

Most of the literature on economic transparency focuses on the disclosure of economic shocks and/or central bank forecasts. When there is (mutual) uncertainty about expectations of the private sector and the central bank, Tarkka and Mayes (1999) argue that the release of central bank forecasts could help and make monetary policy more predictable. Furthermore, Geraats (2000) shows that the publication of central bank forecasts reduces the inflation bias and facilitates reputation

building when there exists uncertainty about the preferences of the central bank. It also provides the central bank greater flexibility to stabilize economic shocks. She finds that inflation forecasts typically do not suffice to reap these benefits. When a central bank uses the interest rate as its policy instrument, central bank forecasts for both inflation and output are needed. In addition, she finds that similar benefits could be obtained when the central bank releases the economic model(s) it uses for policy analysis.

On the other hand, when there is no preference uncertainty, Gersbach (1998) and Cukierman (1999) show that the premature disclosure of economic disturbances could hamper their stabilization in case of a neo-monetarist Lucas-type transmission mechanism. Jensen (2000) also finds a negative stabilization effect using a New-Keynesian Phillips curve and assuming preference uncertainty. Another reason against economic transparency is that it could lead to greater political pressures when the central bank lacks independence or a clear political mandate (Geraats 2001b).

3.3 Procedural Transparency

The only formal models that analyze procedural transparency pertain to the release of individual voting records when central bankers face reelection. Gersbach and Hahn (2001b) show that voting transparency is beneficial when central bankers' preferences may differ from the socially optimal objectives. On the other hand, Gersbach and Hahn (2001a) argue that the disclosure of attributed voting records could be harmful when central bankers differ in their degree of competency.⁷

To the best of our knowledge, there are no models on the desirability of an explicit monetary policy strategy or the publication of minutes. In defence of the latter, Buiters (1999) strongly argues in favor of a "culture of openness and accountability" such that "all information is automatically in the public domain, unless there are overriding public interest reasons for not releasing a particular item". In this light, he promotes the release of non-attributed minutes since attributed, verbatim transcripts are likely to discourage open discussion during the monetary policy meetings.

⁷This result requires that central bankers abstain from voting under secrecy, but perturb the decision by random votes to get reelected under transparency, which is a debatable feature of the model.

3.4 Policy Transparency

There are several papers that analyze the effects of a prompt announcement of the policy decision, and they all focus on (nonborrowed) reserves targeting. Tabellini (1987) shows that when there is uncertainty about the average reserves target, secrecy about the short-term reserves target increases volatility of the federal funds rate, which could be detrimental to the achievement of monetary objectives. On the other hand, Dotsey (1987) argues that secrecy about the short-term monetary target reduces variability of the federal funds rate when the average money target is perfectly known. In addition, Rudin (1988) finds that such policy secrecy could increase the predictability of the federal funds rate when some private sector agents engage in Fed watching. Finally, Cosimano and Van Huyck (1993) find that secrecy about policy directives for reserve targets is beneficial when the central bank's trading desk has an incentive to manipulate reserves to reduce the federal funds rate.

The consequences of immediate policy explanations and indications of policy inclination have not been formally modeled.

3.5 Operational Transparency

An influential precursor to the transparency literature is the paper by Cukierman and Meltzer (1986) on the optimal degree of ambiguity in monetary policy through control errors when the central bank's preferences are uncertain and change over time. Faust and Svensson (2001) extend their model and distinguish between imperfect monetary control and (operational) transparency. Their simulations reveal that operational transparency tends to reduce the inflation bias and improve social welfare. On the other hand, when the degree of transparency is a choice variable for the central bank, Faust and Svensson (2000) argue that minimum transparency is likely to occur in practice. In addition, Jensen (2001) finds that greater operational transparency could be beneficial when central banks suffer from low credibility, but that it limits the ability to stabilize economic disturbances in the case of a new-Keynesian Phillips curve.⁸

This leaves us with the question whether central bank transparency is desirable. Clearly, it depends on which aspect of transparency is considered. But

⁸Another kind of operational transparency that could potentially be considered is the publication of market interventions (see for instance Bhattacharya and Weller (1997) on the desirability of secrecy about the central bank's foreign exchange interventions). However, this issue of market transparency is not included in our transparency index which focuses more on macroeconomic aspects.

even then, there is a wide variety of theoretical arguments regarding the economic consequences, depending on the specific assumptions used. So, ultimately the answer may be that it depends on the type of transparency considered, the monetary framework and the structure of the economy.

Nevertheless, from the perspective of public accountability of monetary policy, which is especially desirable in the case of independent central banks, some degree of transparency is simply necessary. In this respect, possible economic drawbacks of transparency could be considered as the price that society may need to pay for accountability.

4 Index for Central Bank Transparency

To measure the degree of central bank transparency one could analyze the formal disclosure requirements for central banks or the actual disclosure practices. This paper embraces the latter approach because actual practice often goes beyond legal requirements. We present an index that captures the degree of transparency for the five aspects discussed in section 2: political, economic, procedural, policy and operational transparency. There is a subindex for each aspect, based on three questions that each have equal weight and a maximum score of one. A comprehensive measure of transparency is obtained by the sum of the five subindexes, so it has a maximum score of fifteen. A detailed description of our index for central bank transparency is in Appendix A.1.

The index is constructed for nine major central banks: the Reserve Bank of Australia (RBA), the Bank of Canada (BoC), the European Central Bank (ECB), the Bank of Japan (BoJ), the Reserve Bank of New Zealand (RBNZ), the Swedish Riksbank (SRB), the Swiss National Bank (SNB), the Bank of England (BoE), and the U.S. Federal Reserve (Fed).

Our methodology was as follows. First, we sifted through all information published by central banks and other relevant government sources, that was freely available in English as of June 2001.⁹ Second, for each central bank, we sent the scores we had obtained for that central bank together with the detailed description of the transparency index to a senior official at that central bank (chief economist, or comparable) with the request to review the scores.¹⁰ Third, we used the responses to reassess our scores and made a few modifications.¹¹ This methodology

⁹Appendix A.2 contains the complete list of sources used.

¹⁰All central banks responded. Interestingly, all suggested their overall score should be higher, and three central banks argued they deserved the maximum score!

¹¹We adjusted only 4 out of 135 scores, three of which concerned item (2.a) for which publicly

has the advantage that it combines an independent scrutiny of information sources with the expert feedback from central banks, leading to accurate and objective scores.

The final results are presented in Table 1. The results are first briefly discussed by aspect before we turn to an analysis of transparency by central bank in section 5.

4.1 Political Transparency

All central banks in our sample have *formal objectives* for monetary policy (1.a). However, Japan, Switzerland and the United States do not achieve the full score of one on this item because they have multiple objectives without a prioritization. The latter is important because objectives can be conflicting. The other central banks identify price stability as their main objective.

The specification of a *quantitative target* for the main objective(s) of monetary policy (1.b) is popular. Only the Bank of Japan and the Federal Reserve do not have one. All other central banks in our sample have an inflation target, which could be set by the central bank (ECB, SRB), the government (BoE), or be based on a joint agreement (RBA, BoC, RBNZ).

Even more prevalent are *institutional arrangements* between the monetary authorities and the government (1.c), mostly in the form of explicit instrument independence. For several central banks (RBA, BoC, RBZN, BoE) independence is subject to an explicit override procedure. Although it is sometimes argued that this reduces central bank independence, it greatly enhances transparency about the institutional setting. The United States are the only country for which we could not detect formal instrument independence, so it was not awarded the full score of one.¹²

Many central banks get the maximum score of three on political transparency, including the Reserve Bank of Australia, the Bank of Canada, the European Central Bank, the Reserve Bank of New Zealand, the Riksbank and the Bank of England. These are all central banks that have adopted 'inflation targeting', with the exception of the ECB. A particularly interesting case is New Zealand, which clarifies institutional arrangements in the form of a central bank contract (Policy Targets Agreement). It even allows the government to fire the Reserve Bank

available information in English appeared hard to find for Japan, Sweden and Switzerland. In addition, we found information relevant for item (5.a) at a regional Federal Reserve Bank.

¹²Nevertheless, the Fed is often thought to enjoy effective independence from the government and Congress. Although this is not based on formal instrument independence, it could be induced by the anticipation of negative reactions from Wall Street if the Fed is put under political pressure.

Governor if the inflation target is not met.

4.2 Economic Transparency

The economic information that is used for monetary policy includes timely *economic data* (2.a). We looked for quarterly time-series of variables that the academic literature considers important for monetary policy: money supply, inflation, GDP, unemployment rate and capacity utilization. It appears that data on capacity utilization is not always publicly available, which explains why Australia, New Zealand and the United Kingdom do not get the full score.¹³

To interpret the central bank's policy actions it is important to know what kind of *policy models* it employs (2.b). Several central banks (BoC, ECB, RBNZ, BoE, Fed) have published a structural macroeconomic model that is used for policy analysis.

All central banks release numerical *internal forecasts* for inflation and/or output (2.c). However, only the Reserve Bank of New Zealand, the Riksbank and the Bank of England publish medium term forecasts for both inflation and output at quarterly frequency and specify the underlying assumptions about the policy instrument, which we require for the maximum score.¹⁴ This is motivated by the fact that inflation and output tend to be the ultimate objectives of monetary policy and can only be affected in the medium term (one to two years ahead). In addition, the availability of quarterly data for most macroeconomic data suggests that quarterly updates of forecasts are appropriate.

Not a single central bank manages to achieve the maximum score of 3 on economic transparency, although many come close with a score of 2.5 (BoC, ECB, RBNZ, BoE, Fed). The Bank of England deserves special mention on economic transparency. It provides extensive documentation on its economic models, including the computer code for its macroeconometric model. Furthermore, it was the first central bank to introduce colorful fan charts for its internal forecasts of inflation and output, which has set the example for several other central banks.

¹³Interestingly, a few central banks claimed they do not use data on capacity utilization, which is surprising given the prominence of the output gap in theoretical models.

¹⁴We do not discriminate between conditional and unconditional forecasts, although we recognize that they may serve different purposes in terms of communication strategy. In addition, we acknowledge that inflation and output forecasts are suitable for transparency of central banks that adopt an interest rate as the policy instrument, but do not suffice for central banks that use the money supply as instrument.

4.3 Procedural Transparency

Most of the central banks in our sample provide a description of their monetary policy framework in the form of an *explicit monetary policy strategy* (3.a). Typically, the strategy is some form of inflation targeting, although the ECB's "two pillar strategy" is a notable exception. Only the Bank of Japan and the Federal Reserve do not have an explicit monetary policy framework.

Several central banks, in particular the Bank of Japan, the Riksbank, the Bank of England and the Federal Reserve, release a comprehensive account of policy deliberations within a reasonable amount of time (eight weeks) in the form of *minutes* (3.b) that also include a discussion of the forward-looking arguments that are so critical for monetary policy.

These central banks are also the ones that publish individual *voting records* (3.c), except for the Riksbank which does not systematically provide information on voting behavior.^{15,16}

Two central banks stand out for their procedural transparency, the Reserve Bank of New Zealand and the Bank of England. The Reserve Bank of New Zealand is special in the sense that its policy decisions are solely made by its Governor. This means that voting records are immaterial. In addition, minutes are substituted by comprehensive explanations of its decisions, including forward-looking analysis. Although decision-making by committee makes it harder to achieve procedural transparency, the Bank of England shows that this need not be an insurmountable problem, scoring full marks in this respect.

4.4 Policy Transparency

All central banks make a *prompt announcement* of their policy decisions (4.a); their operating instrument or target is a short-term nominal interest rate, with the exception of the Bank of Japan which currently has a monetary target. However, there has not always been openness about policy decisions. The Federal Reserve, for instance, has only adopted this practice since 1994.

In addition, most central banks provide an *explanation* when they announce their policy decisions (4.b). The Reserve Bank of Australia, the European Central Bank, the Bank of Japan and the Bank of England do not get the full score because

¹⁵Although the minutes of the Riksbank sometimes include attributed reservations, these need not coincide with voting dissents.

¹⁶A few central banks told us they decide 'by consensus'. However, this term is ambiguous and need not mean unanimity. In fact, decision making by unanimity would be at odds with legal requirements which typically stipulate decisions be taken by majority voting.

they do not give an explanation after all policy decisions, although they do provide one whenever policy decisions change.

The publication of a *policy inclination* or indication of likely future policy actions (4.c) is unusual. The Federal Reserve includes a statement in its policy announcements that reflects its policy tilt, but only since 1999. The Reserve Bank of New Zealand adopts a different approach and provides short-run quarterly forecasts of short-term nominal interest rates, which essentially convey its likely future policy actions. Both central banks score full marks on policy transparency.¹⁷

4.5 Operational Transparency

The implementation of monetary policy could be complicated by two kinds of disturbances, *control errors* in achieving operating targets (5.a) and unanticipated macroeconomic disturbances that affect the transmission of monetary policy. Most central banks in our sample account for significant deviations from the operating target (if any), or have (nearly) perfect control over their main operating instrument or target. The only exceptions are the Bank of Japan and the Swiss National Bank. The Bank of Japan has an operating target for the outstanding balance of current accounts at the Bank, whereas the Swiss National Bank has an operating range of 100 basis points for the three-month LIBOR rate. Both fall short because they do not provide explanations for significant fluctuations, thereby getting a score of one-half.

Most central banks regularly publish an analysis of current macroeconomic developments or short-term forecasts, which implicitly provide information on *transmission disturbances* (5.b). Nevertheless, two central banks get a score of zero: the Federal Reserve releases its short-run forecasts and macroeconomic analysis only semiannually; and the Swiss National Bank only has a brief abstract of macroeconomic analysis in English. The Riksbank and the Bank of England both obtain the full score as they explain the importance of unanticipated factors by providing an annual discussion of past forecast errors.

Finally, we consider whether central banks regularly provide an *evaluation of the policy outcome* in light of macroeconomic objectives (5.c). Most central banks have some kind of evaluation without providing explanations for deviations from objectives. The Reserve Bank of Australia and the Swiss National Bank are exceptions in the sense that they do not have a regular evaluation.¹⁸ On the other

¹⁷A few central banks suggested that the risks to forecasts they publish indicate a policy inclination. However, it is not straightforward to map risks to inflation and output forecasts into a policy tilt, especially when they go in opposite directions.

¹⁸Interestingly, after asking each central bank for feedback on its scores in July 2001, the Re-

hand, the Riksbank sets a positive example with its explicit annual evaluation in which it accounts for deviations between policy outcomes and objectives, thereby earning the maximum score.

All in all, the Riksbank is the only central bank to achieve full marks on operational transparency. Perhaps, it could be a source of inspiration for other central banks, since the scores on operational transparency vary a lot, with the Swiss National Bank getting the lowest score (0.5) for any of the five aspects.

The comprehensive index that consists of the sum of the subscores for each of the five aspects reveals which central banks are the most transparent. The highest score is achieved by the Reserve Bank of New Zealand (13.5 out of 15), closely followed by the Bank of England (12.5) and the Riksbank (12). The subtop is formed by the Bank of Canada (10.5), the European Central Bank (10) and the Federal Reserve (10). The Reserve Bank of Australia (8), the Bank of Japan (8) and the Swiss National Bank (7.5) appear to be the least transparent central banks in our sample.

5 How Transparent Are Central Banks?

The previous section provided an analysis of the performance on each aspect of transparency across central banks. This section complements that view with a brief description of all the aspects of transparency for each central bank.

Reserve Bank of Australia

Although the Reserve Bank of Australia has adopted inflation targeting, it gets one of the lowest transparency scores (8) in our sample. The fact that the RBA is an inflation targeter is reflected in the maximum score (3) on political transparency. It has an inflation target of 2-3% and enjoys instrument independence subject to an explicit override mechanism. However, its openness on other aspects is much less. With a score of only 1 on economic transparency it misses two points for several reasons: it does not publish quarterly data on capacity utilization, there is no explicit policy model,¹⁹ and it only provides rough short term forecasts for inflation (quarterly) and output (semiannually). On procedural transparency the RBA scores only 1 because it does not release minutes and voting records. Its score for policy transparency (1.5) reflects the lack of an explicit

Reserve Bank of Australia suddenly started providing an implicit graphical evaluation of its inflation target in its quarterly *Statement on Monetary Policy*. We can only speculate on the reason for this.

¹⁹Although a structural macroeconomic model appears in one of its *Research Discussion Papers* (2000-05), it is not made clear whether the Bank uses it for policy analysis.

policy inclination and the fact that it only provides an explanation of decisions when policy changes. Regarding operational transparency, the RBA misses 1.5 points because the information on transmission disturbances does not include a discussion of past forecast errors, and because there is no evaluation of the policy outcome in light of its macroeconomic objectives.²⁰

The Reserve Bank of Australia shows that inflation targeting does not guarantee transparency in all aspects.

Bank of Canada

The Bank of Canada, another inflation targeter, secures a place in the subtop with a score of 10.5. It earns the full score (3) on political transparency, with an explicit inflation target of 1-3% and instrument independence subject to an explicit override mechanism. On economic transparency the BoC achieves a respectable score of 2.5 points, missing 0.5 points because it only publishes rough short-term projections for inflation and output, a practice which dates to November 1998. On procedural transparency, the BoC gets only 1 point because it does not disclose minutes and voting records. Concerning policy transparency it receives 2 points and just misses 1 point because it does not give an explicit indication of likely future policy actions. On operational transparency the BoC also receives 2 points. It misses credit for not discussing past forecast errors. In addition, although it publishes a graphical evaluation of the inflation outcome, it does not explicitly account for deviations from the target.²¹

All in all, the Bank of Canada performs quite well, although it displays some weakness in procedural transparency.

European Central Bank

With a score of 10, the European Central Bank is also in the subtop. Although it is not an inflation targeter, it achieves the maximum score (3) on political transparency. It has a quantitative definition of price stability of 0-2% inflation and its independence is firmly enshrined in an international treaty. For economic transparency the ECB earns high marks (2.5). This is entirely due to recent developments. In January 2001 it disclosed its structural macroeconomic model of the euro area, and since December 2000 it has published its semiannual medium term conditional projections for inflation and output. The ECB emphasizes that

²⁰However, as described in footnote 18, its performance in this regard has improved a bit recently.

²¹It should be mentioned that the BoC announced in May 2001 that it will explain significant deviations of inflation from the midpoint of the target, but this had not yet been implemented by June 2001, the deadline for our investigation.

these projections are made by ECB staff and not binding for the ECB Governing Council.²² On procedural transparency the ECB gets only 1 point because it does not provide comprehensive minutes and actual voting records. Concerning policy transparency, the ECB earns 1.5 points. Although it does provide an explanation of the policy decision including a forward-looking assessment at the monthly press conferences, this is only done after the first policy meeting of the month (out of two). In addition, it does not provide an explicit policy inclination. On operational transparency the ECB misses 1 point. The reason is that the ECB provides some information on unanticipated macroeconomic disturbances that affect the policy transmission through macroeconomic analysis in its Monthly Bulletin, but it does not (yet?) discuss past forecast errors. In addition, the ECB provides an informal evaluation of the policy outcomes in its Monthly Bulletin, but it does not explicitly account for deviations from its objectives.

In its early years of existence, the European Central Bank has already achieved quite some transparency in several respects, but it could use some improvement on procedural and policy transparency.²³

Bank of Japan

The Bank of Japan has one of the lowest transparency scores (8) in our sample. It only gets 1.5 points for political transparency because it has multiple objectives of monetary policy without explicit prioritization, and no precise definition or quantification of its objectives. On economic transparency the BoJ scores 1.5 points. It does not disclose a formal macroeconomic model for policy analysis. In addition, very recently (as of April 2001) it started publishing its forecasts for inflation and output, but only at semiannual frequency. Regarding procedural transparency, the BoJ does quite well with 2 points. It publishes elaborate minutes in a timely fashion, including individual voting records, and only misses 1 point because it lacks an explicit monetary policy strategy. On policy transparency the BoJ only scores 1.5 points. The reason is that it just provides an explanation of its policy decisions in case of a change and does not disclose an explicit policy inclination. On operational transparency the BoJ earns 1.5 points and misses some points on all counts. It does not provide explanations for significant deviations

²²It should be mentioned that the publication of projections has been triggered by the Committee on Economic and Monetary Affairs of the European Parliament in its quarterly Monetary Dialogue with the ECB based on Article 113(3) of the Treaty on European Union and on the advice of its Panel of Experts in their quarterly Briefing Paper (see: www.europarl.eu.int/committees/econ/home.htm and click on 'Monetary Dialogue with the ECB').

²³This also sheds light on the debate on ECB transparency between Buitert (1999) and Issing (1999), which is discussed by de Haan and Eijffinger (2000).

of its main policy operating target.²⁴ Also, the BoJ gives information on macroeconomic disturbances through a monthly analysis of the current macroeconomic situation, but not (yet?) through a discussion of past forecast errors. Finally, it does not account for deviations between the policy outcomes and the objectives.

The Bank of Japan has recently shown some improvement in transparency, but it still falls short in several respects, most noticeably political and policy transparency.

Reserve Bank of New Zealand

The Reserve Bank of New Zealand achieves the highest transparency score (13.5) in our sample. It engages in inflation targeting, with an inflation target of 0-3% and instrument independence subject to an explicit override mechanism, earning the full score (3) on political transparency. For economic transparency it receives a respectable 2.5 points, with only quarterly data for capacity utilization missing. On procedural transparency the RBNZ gains the maximum score (3), but this is only since December 2000 when it started giving explanations also for decisions not to change the policy instrument. Concerning operational transparency, it does quite well with a score of 2. It misses credit because the information on macroeconomic transmission disturbances it provides is only through an analysis of the current macroeconomic situation and short-term forecasts; it does not include a discussion of past forecast errors. In addition, the RBNZ gives an evaluation of the policy outcome, but provides no explicit account for deviations from its inflation target.

The performance of the Reserve Bank of New Zealand on transparency is outstanding. Nevertheless, significant improvement is still feasible on operational transparency.

Swedish Riksbank

The Swedish Riksbank ranks third in our overall transparency index with a score of 12. It is also an inflation targeter with a maximum score on political transparency. It has an inflation target of 2% and enjoys formal independence. On economic transparency the SRB earns 2 points and only misses 1 point because it does not disclose a formal macroeconomic model used for policy analysis. Regarding procedural transparency, the SRB does quite well with 2 points. It releases minutes, but does not disclose voting records. Although attributed reservations against the decision are sometimes mentioned in its minutes, it is not clear

²⁴The BoJ used to have a target for the uncollateralized overnight call rate. But with the call rate at essentially zero, it changed the operating target in March 2001 to the outstanding balance of current accounts at the Bank.

whether those are (the only) dissents. On policy transparency the SRB also earns 2 credits, only missing points because it does not disclose an explicit policy tilt. For operational transparency the SRB gains full marks. Since 1999, it provides an annual evaluation of the inflation outcome over the last three years, with a discussion of deviations from its inflation target.

The Swedish Riksbank is quite transparent. Its strengths are political and operational transparency, but there is still some room for improvement on other aspects.

Swiss National Bank

The Swiss National Bank receives the lowest transparency score in our sample with 7.5 points. It does not get full marks on political transparency; its quantitative definition of price stability is inflation below 2%, but it has multiple objectives without an explicit prioritization. On economic transparency the SNB scores 1.5 points. It does not disclose a formal policy model. In addition, although it has published a three-year forecast for inflation since 1999, these forecasts are only at semiannual frequency. On procedural transparency the SNB receives only 1 point because it releases neither minutes nor voting records. Concerning policy transparency the SNB gets 2 points, missing 1 point because it does not provide an explicit policy inclination. On operational transparency the SNB only has a score of 0.5 point. It has an operational target range for the LIBOR of 100 basis points, but it does not provide an explanation for significant fluctuations within that range. Although it provides an elaborate analysis of macroeconomic developments, only a brief abstract is available in English.²⁵ Finally, the SNB gives merely a review of the year, and it does not account for discrepancies between policy outcome and target.

The Swiss National Bank performs poorly on transparency when compared to the other central banks in our sample. There is a lot of scope for improvement, especially on economic and operational transparency.

Bank of England

The Bank of England achieves the second highest transparency score (12.5) in our sample. It is an inflation targeter with full marks for political transparency; it has an inflation target of 2.5% and since 1998, instrument independence subject to an explicit override mechanism. Regarding economic transparency, its score of 2.5 points is due to the fact that no quarterly time series is available for capacity utilization. On procedural transparency the BoE gains the maximum score (3). For

²⁵If information were not restricted to be in English, the SNB would gain 0.5 point on item (5.b).

policy transparency it only receives 1.5 points. The reason is that it only provides an explanation of changes in policy decisions at the time of announcement (since April 2001), but not when it is decided not to adjust the policy instrument. In addition, the BoE does not provide an explicit policy inclination. On operational transparency the BoE scores very high (2.5) and only misses 0.5 points because it does not account for deviations of inflation from its target.

The Bank of England is quite transparent. However, it still shows weakness in policy transparency, despite some recent improvements in that area.

Federal Reserve System

The total score for the Federal Reserve is 10, securing a place in the subtop. For political transparency it only receives 1 point. It has multiple objectives without an explicit prioritization. Also, there is no quantification of its objectives for monetary policy. Finally, the Federal Reserve has no explicit, formal instrument independence. On economic transparency the Fed does very well with 2.5 points, missing 0.5 points because it only publishes short-term economic projections for inflation and output at a semiannual frequency. Concerning procedural transparency, the Fed gets 2 points because it does not have an explicit policy strategy that describes its monetary policy framework. For policy transparency the Fed earns full marks (3). Its score for operational transparency is only 1.5 points. Although the Fed provides a macroeconomic analysis and short-term forecasts for inflation and output, this is only at semiannual frequency. In addition, it provides only an informal evaluation of policy outcomes.

The Federal Reserve has great strength in policy transparency, but displays noticeable weakness in political transparency.

It appears that the Federal Reserve System has exactly the same overall score as the European Central Bank. But there are important differences. It scores relatively better on procedural and policy transparency, but worse on political and operational transparency than the ECB.

6 Concluding Remarks

Our comprehensive analysis of central bank transparency gives rise to some interesting conclusions.

The most transparent central banks are the Reserve Bank of New Zealand, the Bank of England and the Swedish Riksbank. The subtop is formed by the Bank of Canada, the European Central Bank and the Federal Reserve. The least transparent central banks in our sample are the Reserve Bank of Australia, the

Bank of Japan and the Swiss National Bank.

Although the most transparent central banks in our sample are all inflation targeters, there is remarkable variation in overall transparency among central banks that have adopted inflation targeting. For instance, the Reserve Bank of Australia gets one of the lowest scores. It is striking that inflation targeters all achieve the maximum score on political transparency, which describes openness about objectives, quantitative targets and institutional arrangements. However, inflation targeting is not a necessary condition for political transparency, as is exemplified by the European Central Bank.

It should be noted that our analysis of the various aspects of central bank transparency is designed to be independent of the monetary policy framework and does not seem to be biased towards inflation targeters, given the large variation within this category. In principle, other monetary policy strategies, like monetary targeting or the ECB's two-pillar strategy, could all obtain the maximum score for any aspect of transparency.

It is interesting to see that central banks put different emphasis on the various aspects of transparency. For instance, the European Central Bank and the Federal Reserve both achieve the same overall score on transparency. But the ECB has its strength in political transparency, whereas the Fed excels in transparency about its policy decisions in the form of a prompt announcement, explanation and policy inclination.

Finally, it is intriguing to see that central bank transparency also has a dynamic aspect. The scores for several central banks have increased significantly because of recent changes, and for some there are signs that they are about to increase. In either case, the trend appears to be towards greater central bank transparency.

A Appendix

This appendix contains the exact formulation of the central bank transparency index and the sources used to construct the scores reported in Table 1.

A.1 Central Bank Transparency Index

The central bank transparency index is the sum of the scores for the answers to all questions below (min = 0, max = 15). Note that all questions pertain to published information that is freely available in English.

1. Political Transparency

Political transparency refers to openness about policy objectives. This comprises a formal statement of objectives, including an explicit prioritization in case of multiple goals, a quantification of the primary objective(s), and explicit institutional arrangements.

- (a) Is there a formal statement of the objective(s) of monetary policy, with an explicit prioritization in case of multiple objectives?

No formal objective(s) = 0.

Multiple objectives without prioritization = 1/2.

One objective, or multiple objectives with explicit priority = 1.

- (b) Is there a quantification of the primary objective(s)?

No = 0.

Yes = 1.

- (c) Are there explicit institutional arrangements or contracts between the monetary authorities and the government?

No central bank, contracts or other institutional arrangements = 0.

Central bank without explicit instrument independence or contract = 1/2.

Central bank with explicit instrument independence or central bank contract (although possibly subject to an explicit override procedure) = 1.

2. Economic Transparency

Economic transparency focuses on the economic information that is used for monetary policy. This includes economic data, the model of the economy that the central bank employs to construct forecasts or evaluate the impact

of its decisions, and the internal forecasts (model based or judgmental) that the central bank relies on.

- (a) Is the basic economic data relevant for the conduct of monetary policy publicly available?

The focus is on the following five variables: money supply, inflation, GDP, unemployment rate and capacity utilization.

Quarterly time series for at most two out of the five variables = 0.

Quarterly time series for three or four out of the five variables = 1/2.

Quarterly time series for all five variables = 1.

- (b) Does the central bank disclose the formal macroeconomic model(s) it uses for policy analysis?

No = 0.

Yes = 1.

- (c) Does the central bank regularly publish its own macroeconomic forecasts?

No numerical central bank forecasts for inflation and output = 0.

Numerical central bank forecasts for inflation and/or output published at less than quarterly frequency = 1/2.

Quarterly numerical central bank forecasts for inflation and output for the medium term (one to two years ahead), specifying the assumptions about the policy instrument (conditional or unconditional forecasts) = 1.

3. Procedural Transparency

Procedural transparency is about the way monetary policy decisions are taken. It involves an explicit monetary policy rule or strategy that describes the monetary policy framework, an account of policy deliberations and how the policy decision was reached.

- (a) Does the central bank provide an explicit policy rule or strategy that describes its monetary policy framework?

No = 0.

Yes = 1.

- (b) Does the central bank give a comprehensive account of policy deliberations (or explanations in case of a single central banker) within a reasonable amount of time?

No, or only after a substantial lag (more than eight weeks) = 0.

Yes, comprehensive minutes (although not necessarily verbatim or attributed) or explanations (in case of a single central banker), including a discussion of backward- and forward-looking arguments = 1.

- (c) Does the central bank disclose how each decision on the level of its main operating instrument or target was reached?

No voting records, or only after substantial lag (more than eight weeks) = 0.

Non-attributed voting records = 1/2.

Individual voting records, or decision by single central banker = 1.

4. Policy Transparency

Policy transparency means prompt disclosure of policy decisions. In addition, it includes an explanation of the decision, and an explicit policy inclination or indication of likely future policy actions.

- (a) Are decisions about adjustments to the main operating instrument or target promptly announced?

No, or after a significant lag = 0.

Yes, at the latest on the day of implementation = 1.

- (b) Does the central bank provide an explanation when it announces policy decisions?

No = 0.

Yes, when policy decisions change, or only superficially = 1/2.

Yes, always and including forwarding-looking assessments = 1.

- (c) Does the central bank disclose an explicit policy inclination after every policy meeting or an explicit indication of likely future policy actions (at least quarterly)?

No = 0.

Yes = 1.

5. Operational Transparency

Operational transparency concerns the implementation of the central bank's policy actions. It involves a discussion of control errors in achieving operating targets and (unanticipated) macroeconomic disturbances that affect the transmission of monetary policy. Furthermore, the evaluation of the macroeconomic outcomes of monetary policy in light of its objectives is included here as well.

- (a) Does the central bank regularly evaluate to what extent its main policy operating targets (if any) have been achieved?
- No, or not very often (at less than annual frequency) = 0.
Yes, but without providing explanations for significant deviations = 1/2.
Yes, accounting for significant deviations from target (if any); or, (nearly) perfect control over main operating instrument/target = 1.
- (b) Does the central bank regularly provide information on (unanticipated) macroeconomic disturbances that affect the policy transmission process?
- No, or not very often = 0.
Yes, but only through short-term forecasts or analysis of current macroeconomic developments (at least quarterly) = 1/2.
Yes, including a discussion of past forecast errors (at least annually) = 1.
- (c) Does the central bank regularly provide an evaluation of the policy outcome in light of its macroeconomic objectives?
- No, or not very often (at less than annual frequency) = 0.
Yes, but without providing explanations for deviations = 1/2.
Yes, with an explicit account for deviations between policy outcomes and objectives = 1.

A.2 Sources

This section contains the detailed information and sources for each of the components of the index [with scores in bold in square brackets]. Nearly all information is available from central banks' web sites.

Reserve Bank of Australia (<http://www.rba.gov.au>)

1.a [1] Objectives: (a) the stability of the currency of Australia; (b) the maintenance of full employment in Australia; and (c) the economic prosperity and welfare of the people of Australia. *Reserve Bank Act 1959*, Part II 10(2), Functions of Reserve Bank Board.

Prioritization: "These objectives allow the Reserve Bank to focus on price (currency) stability while taking account of the implications of monetary policy for activity and, therefore, employment in the short term." *Statement on the Conduct of Monetary Policy*, by the Treasurer and the Reserve Bank Governor (designate), 14 August 1996.

1.b [1] "In pursuing the goal of medium term price stability the Reserve Bank has adopted the objective of keeping underlying inflation between 2 and 3 per cent, on average, over the cycle." *Statement on the Conduct of Monetary Policy*, by the Treasurer and the Reserve Bank Governor (designate), 14 August 1996.

1.c [1] Operational responsibility: *Reserve Bank Act 1959*, Part II 10(1).

Explicit override procedure: *Reserve Bank Act 1959*, Part II 11.

Instrument independence: "The Government recognises the independence of the Bank and its responsibility for monetary policy matters and intends to respect the Bank's independence as provided by statute. Section 11 of the Reserve Bank Act prescribes procedures for the resolution of policy differences between the Bank and the Government. The procedures, in effect, allow the Government to determine policy in the event of a material difference; but the procedures are politically demanding and their nature reinforces the Bank's independence. Safeguards like this ensure that monetary policy is subject to the checks and balances inherent and necessary in a democratic system." *Statement on the Conduct of Monetary Policy*, by the Treasurer and the Reserve Bank Governor (designate), August 14, 1996.

2.a [0.5] Money, price, output and unemployment data are available from web site under Statistics.

2.b [0] Although Meredith Beechey, Nargis Bharucha, Adam Cagliarini, David Gruen, Christopher Thompson, "A small model of the Australian macro economy", *Reserve Bank of Australia Research Discussion Paper 2000-05*, provide a macroeconomic model, it is not made clear whether this is used by the Reserve Bank for policy analysis.

2.c [0.5] Since November 2000, the Reserve Bank publishes a quarterly *Statement on Monetary Policy* (replacing the *Semi-Annual Statement on Monetary Policy* and the *Quarterly Report on the Economy and Financial Markets*, published since 1997), which contains a rough short-term inflation projection. In addition, the *Opening Statement to House of Representatives Standing Committee on Economics, Finance and Public Administration* of the semi-annual testimony by the Governor, which is held since 1997, contains a rough short-term output forecast.

3.a [1] The monetary policy framework of inflation targeting is outlined in the *Statement on the Conduct of Monetary Policy*, by the Treasurer and the Reserve Bank Governor (designate), 14 August 1996.
See also http://www.rba.gov.au/MonetaryPolicy/about_monetary_policy.html

3.b [0] No minutes available.

3.c [0] No voting records available.

4.a [1] Changes in policy decision are usually announced the day after the policy meeting at 9:30am, when the policy implementation starts (at least since 1990).

4.b [0.5] Policy explanations including forward-looking assessments released together with announcement of policy decision but only when policy changes (at least since 1990).

4.c [0] No explicit policy inclination.

5.a [1] Operating target for the cash rate (interest rate on overnight interbank loans in money market). Since 1998, a graphical evaluation of the cash rate target in the annual *Report and Financial Statements*, Operations in Financial Markets, shows nearly perfect control.

5.b [0.5] Analysis of macroeconomic developments and rough short-term inflation forecast in quarterly *Statement on Monetary Policy*.

5.c [0] Policy outcome not compared to objectives. [However, implicit graphical evaluation of inflation target since August 2001 *Statement on Monetary Policy*.]

Bank of Canada (<http://www.bankofcanada.ca/>)

1.a [1] Objectives: “to regulate credit and currency in the best interests of the economic life of the nation, to control and protect the external value of the national monetary unit and to mitigate by its influence fluctuations in the general level of production, trade, prices and employment, so far as may be possible within the scope of monetary action, and generally to promote the economic and financial welfare of Canada”. *Bank of Canada Act*, Preamble.

Prioritization: The “Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Inflation-Control Target” (May 17, 2001) clarifies that “The best contribution monetary policy can make to securing this outcome is

to preserve confidence in the value of money by providing individuals and businesses with the certainty of a stable, low-inflation environment for their economic decisions” and expresses the commitment of the Government and Bank to an explicit inflation-control target.”

1.b [1] Inflation-control target range (since 1991), currently equal to 1-3%, focused around the midpoint of 2% and using 12-month CPI inflation. See the press releases “Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Inflation-Control Target” (May 17, 2001) and “Renewal of the Inflation-Control Target: Background Information” (May 18, 2001).

1.c [1] Explicit override procedure: *Bank of Canada Act* 14(2)-(3).

2.a [1] Information available in the *Bank of Canada Review*, e.g. Spring 2001 issue, Table A2: Major Financial and Economic Indicators.

2.b [1] Policy model described by Richard Black and David Rose (1997), “Canadian Policy Analysis Model (CPAM)”, *Bank of Canada Working Paper* 97-16.

2.c [0.5] Rough short-term projections for inflation and output in quarterly *Monetary Policy Report (Update)*.

3.a [1] “Inflation-control targeting strategy” (since 1991) is described in the June 2000 *Monetary Policy Report*. See also “Renewal of the Inflation-Control Target: Background Information”, May 2001.

3.b [0] No minutes available.

3.c [0] No voting records available.

4.a [1] Policy decisions announced at 9am on fixed announcement days (which started only in December 2000; previously, same day announcement of changes in policy actions).

4.b [1] Press release with announcement of policy decision includes explanation with forward-looking assessments.

4.c [0] No explicit policy inclination.

5.a [1] Main operating instrument used to be the Bank rate, which is the interest rate the Bank of Canada charges on one-day loans to financial institutions and the ceiling of an operating target of 50 basis points for the overnight rate. Since May 2001, the Bank has focused on the Overnight Rate Target, which is the midpoint of the operating target, as the key policy rate.

5.b [0.5] Analysis of macroeconomic developments and rough short-term inflation and output forecast in quarterly *Monetary Policy Report (Update)*.

5.c [0.5] Graphical evaluation of policy outcome in quarterly *Monetary Policy Report (Update)*, but without explicitly accounting for deviations from objectives. [In “Renewal of the Inflation-Control Target: Background Information”, May 2001, the Bank announced that persistent deviations in inflation from the target

midpoint will be explained in the quarterly *Monetary Policy Report (Update)*, but this was not yet implemented by June 2001.]

[Note: Unfortunately, the Bank of Canada web site does not contain an archive of past issues of the *Monetary Policy Report (Update)*.]

European Central Bank (<http://www.ecb.int>)

1.a [1] Objectives and prioritization: “the primary objective of the ESCB shall be to maintain price stability. Without prejudice to the objective of price stability, it shall support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community as laid down in Article 2 of this Treaty” *Protocol on the Statute of the European System of Central Banks and of the European Central Bank*, Art. 2.

1.b [1] Quantitative definition of price stability: annual increase of the Harmonised Index of Consumer Prices (HICP) for the Euro area of less than 2 per cent. See ECB press release “A stability-oriented monetary policy strategy for the ESCB”, 13 October 1998.

1.c [1] Independence: “When exercising the powers and carrying out the tasks and duties conferred upon them by this Treaty and this Statute, neither the ECB, nor a national central bank, nor any member of their decision making bodies shall seek or take instructions from Community institutions or bodies, from any government of a Member State or from any other body.” *Protocol on the Statute of the ESCB and of the ECB*, Art. 7.

2.a [1] Information available in the *Monthly Bulletin*, section “Euro area statistics”.

2.b [1] Policy model described by G. Fagan, J. Henry and R. Metz, “An Area-Wide Model (AWM) for the Euro Area”, *European Central Bank Working Paper* 42, January 2001.

2.c [0.5] Since December 2000, medium term conditional inflation and output projections are published twice a year in the June and December *Monthly Bulletin*.

3.a [1] “Two Pillar Strategy” with (1) a prominent role for money, and (2) a broadly based assessment both of the outlook regarding price developments and of the risks to price stability in the Euro area as a whole. *Monthly Bulletin* January 1999.

3.b [0] No minutes available.

3.c [0] No voting records available. [It has been suggested that the ECB decides “by consensus”. However, according to the *Protocol on the Statute of the ESCB and of the ECB*, Art. 10(2), the Governing Council shall act by majority voting.]

4.a [1] Policy decisions are announced the same day.

4.b [0.5] The President provides an explanation of the policy decision including forward-looking assessment at a press conference after the first policy meeting of the month, but not for the second. [There are two scheduled meetings per month.]

4.c [0] No explicit policy inclination.

5.a [1] Main operating instruments are minimum bid rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility.

5.b [0.5] Analysis of current macro developments in *Monthly Bulletin*.

5.c [0.5] Informal evaluation of policy outcome in *Monthly Bulletin*, without explicitly accounting for deviations between outcomes and objectives.

Bank of Japan (<http://www.boj.or.jp>)

1.a [0.5] Multiple objectives without priority: to issue banknotes; to carry out currency and monetary control aimed at contributing to the sound development of the national economy through the pursuit of price stability; and, to ensure smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of an orderly financial system. *Bank of Japan Law* Art. 1 and 2.

1.b [0] No precise definition and/or quantification of the objectives could be found.

1.c [1] Independence: "The Bank of Japan's autonomy regarding currency and monetary control shall be respected." *Bank of Japan Law*, Art. 3.

2.a [1] Data is available at the following web sites: money at Bank of Japan; inflation and unemployment rate at Statistics Bureau and Statistics Center (www.stat.go.jp); GDP at Cabinet Office (www.esri.cao.go.jp); capacity utilization at Ministry of Economy, Trade and Industry (www.meti.go.jp).

2.b [0] No explicit policy model could be found.

2.c [0.5] Since April 2001, the semi-annual *Outlook and Risk Assessment of the Economy and Prices* contains short-term conditional forecasts for inflation and output by the Policy Board.

3.a [0] No explicit monetary strategy could be found.

3.b [1] Non-attributed minutes are released approximately six weeks after policy meeting, including summary of discussions, remarks by Government representative and individual votes.

3.c [1] Individual voting records are published together with minutes, approximately six weeks after the policy meeting.

4.a [1] Policy decisions are announced the same day.

4.b [0.5] Policy explanation at the time of announcement but only when policy decision changes.

4.c [0] No explicit policy inclination.

5.a [0.5] Main operating target: outstanding balance of the current accounts at the Bank (since March 19, 2001; previously, uncollateralized overnight call rate), but no evaluation of deviations from target.

5.b [0.5] Analysis of macroeconomic situation in *Monthly Report of Recent Economic and Financial Developments*.

5.c [0.5] Informal evaluation of policy outcome in *Monthly Report of Recent Economic and Financial Developments*, without explicitly accounting for deviations between outcomes and objectives.

[Unfortunately, the Bank of Japan web site appears quite hard to navigate, but for those who persist it provides very elaborate information.]

Reserve Bank of New Zealand (<http://www.rbnz.govt.nz/>)

1.a [1] Primary objective: “The primary function of the Bank is to formulate and implement monetary policy directed to the economic objective of achieving and maintaining stability in the general level of prices.” *Reserve Bank Act* 1989, Part II, Sec 8.

In addition: “Have regard to the efficiency and soundness of the financial system” *Reserve Bank Act* 1989, Part II, Sec 10; and “In pursuing its price stability objective, the Bank shall implement monetary policy in a sustainable, consistent and transparent manner and shall seek to avoid unnecessary instability in output, interest rates and the exchange rate.” *Policy Targets Agreement*, December 16, 1999.

1.b [1] Policy target: 12-monthly increase in the CPI between 0 and 3 %. *Policy Targets Agreement*, December 16, 1999.

1.c [1] Independence: operational independence subject to *Policy Targets Agreement* and override mechanism. See *Reserve Bank Act* 1989, Part II, Sec 13.

Explicit override mechanism: *Reserve Bank Act* 1989, Part II, Sec 12

2.a [0.5] All the time series except for capacity utilization can be found on the web site under Statistics.

2.b [1] The macroeconomic model used for medium term analysis is presented by Richard Black, Vincenzo Cassino, Aaron Drew, Eric Hansen, Benjamin Hunt, David Rose and Alasdair Scott (1997), “The Forecasting and Policy System”, *Reserve Bank of New Zealand Research Paper* 43.

2.c [1] The quarterly *Monetary Policy Statement* includes numerical, unconditional projections for inflation and output up to three years ahead.

3.a [1] Inflation targeting strategy described in “Independent review of the operation of monetary policy: Submission by the Reserve Bank of New Zealand”, September 2000, <http://www.rbnz.govt.nz/monpol/review/0096189.pdf>.

3.b [1] Comprehensive explanation of policy decisions by Reserve Bank Governor published in quarterly *Monetary Policy Statement* (including medium term macroeconomic projections) about six weeks after Official Cash Rate review dates.

3.c [1] Policy decisions are made by the Governor.

4.a [1] Policy decisions are promptly announced at Official Cash Rate review dates.

4.b [1] Explanation of policy decision at time of announcement, including forward-looking assessment. [Explanations for no-change decisions only since December 2000.]

4.c [1] The quarterly *Monetary Policy Statement* includes three-year ahead unconditional forecasts for the 90-day bank bill rate, which is very closely related to the Official Cash Rate.

5.a [1] Main operating instrument: Official Cash Rate, which is the midpoint of an operating band of 50 basis points for the interbank interest rate (since March 1999).

5.b [0.5] Analysis of macroeconomic developments and short-term forecasts for inflation in quarterly *Monetary Policy Statement*.

5.c [0.5] Graphical evaluation of policy outcome in quarterly *Monetary Policy Statement*, without explicitly accounting for deviations. See also "The Year in Review" in the *Annual Report*.

Swedish Riksbank (<http://www.riksbank.com/>)

1.a [1] "The objective of the Riksbank's operations shall be to maintain price stability. In addition, the Riksbank shall promote a safe and efficient payment system. *Sveriges Riksbank Act*, Chapter 1, Art. 2

1.b [1] Inflation target (since 1993) of 2 % with a margin of ± 1 percentage point. *Annual Report* 1998.

1.c [1] Independence: "The Riksbank is responsible for monetary policy. No authority may determine the decisions made by the Riksbank on issues relating to monetary policy." *Constitution Act*, Chapter 9, Art. 12 (1998 amendment). And "Members of the Executive Board may not seek nor take instructions when they are fulfilling their monetary policy duties." *Sveriges Riksbank Act*, Chapter 3, Art. 2.

2.a [1] All information is available from the Riksbank web site; data on money under the heading Statistics, and data on inflation, GDP, unemployment rate and capacity utilization (in the form of econometric estimates of the output gap) in Excel spreadsheets that are made available for downloading with each *Inflation Report*.

- 2.b [0] No explicit policy model could be found.
- 2.c [1] Conditional inflation and output forecasts for a two-year horizon are published in the quarterly *Inflation Report*.
- 3.a [1] Monetary policy framework is explained as 'rule-of-thumb' adjustment of repo rate based deviation of inflation forecast from target, with two exceptions: (1) temporary inflation effects are disregarded, and (2) adjustment is gradual in case of costly real effects (*Annual Report* 2000, p. 10). [Essentially flexible inflation forecast targeting.]
- 3.b [1] Detailed non-attributed minutes including policy discussions, released 2-3 weeks after the meeting.
- 3.c [0] No actual voting records available, although attributed reservations against the decision are sometimes noted in the minutes.
- 4.a [1] Policy decisions are announced one day after the policy meeting, but before implementation.
- 4.b [1] Explanation of all policy decisions at time of announcement, including forward-looking assessment.
- 4.c [0] No explicit policy inclination.
- 5.a [1] Main operating instrument: Repo rate.
- 5.b [1] Analysis of macroeconomic developments and macroeconomic forecasts in quarterly *Inflation Report*. In addition, annual discussion of past inflation forecast errors in March *Inflation Report* (since 1999).
- 5.c [1] Annual evaluation of inflation outcome over last three years in March *Inflation Report* with a discussion of deviations between outcomes and objectives (since 1999).

Swiss National Bank <http://www.snb.ch>)

- 1.a [0.5] Objectives: "The principal task of the National Bank is to regulate the country's money circulation, to facilitate payment transactions, and to pursue a credit and monetary policy serving the interests of the country as a whole." *National Bank Law* Art. 2(1)
- 1.b [1] Quantitative definition of price stability: inflation rate as measured by the national consumer price index of less than 2 % per annum. *Annual Report* 2000.
- 1.c [1] "As an independent central bank, the Swiss National Bank shall pursue a monetary policy serving the interests of the country as a whole" *Federal Constitution* Art. 99(2) (since January 2000)
- 2.a [1] Money, inflation, output and unemployment data are available in the *Statistical Monthly Bulletin*. Other data is available via Swiss Statistics web site (www.statistics.admin.ch).

- 2.b [0] No policy model could be found.
- 2.c [0.5] Inflation forecast for the three ensuing years in the June and December *Quarterly Bulletin* (since December 1999); only December forecast available in English abstracts.
- 3.a [1] Monetary policy concept (effectively inflation targeting) described in *Annual Report 2000*, p. 33-36.
- 3.b [0] No minutes available.
- 3.c [0] No voting records available.
- 4.a [1] Policy decisions are announced the same day.
- 4.b [1] Explanation of all policy decisions at time of announcement with forward-looking assessment.
- 4.c [0] No explicit policy inclination.
- 5.a [0.5] Operational target range of 100 basis points for three-month LIBOR rate (since end of 1999) graphically evaluated in *Annual Report 2000* (p. 39). Significant fluctuations within target, but no explanations.
- 5.b [0] Analysis of macroeconomic developments in *Quarterly Bulletin*, but only brief abstract available in English. No analysis in *Monthly Statistical Bulletin*, merely graphs (again only brief abstract in English).
- 5.c [0] The Bank only gives a review of the year, but doesn't account for discrepancies between policy outcome and target.

Bank of England (<http://www.bankofengland.co.uk>)

- 1.a [1] "The objectives of the Bank of England are to maintain price stability and, subject to that, support the economic policy of Her Majesty's Government, including its objectives for growth and employment." *Bank of England Act 1998*, Ch 11 Part II, Sec 11
- 1.b [1] The price stability objective is to achieve underlying inflation (measured by the RPI excluding mortgage interest rates) of 2.5%.
- 1.c [1] Operational responsibility: *Bank of England Act 1998*, Ch 11, Part II, Sec 10.
Explicit override mechanism: *Bank of England Act 1998*, Ch 11, Part II, Sec 19.
- 2.a [0.5] Time series are available from the Office of National Statistics web site (www.statistics.gov.uk), with the exception of capacity utilization.
- 2.b [1] Extensive documentation on policy models in *Economic Models at the Bank of England: September 2000 Update*, and the computer code of the macroeconomic model is available on the web site.
- 2.c [1] Conditional inflation and output forecasts for a two-year horizon are published in the quarterly *Inflation Report*.

- 3.a [1] Monetary policy framework described on web site (www.bankofengland.co.uk/framework.htm)
- 3.b [1] Comprehensive non-attributed minutes released about two weeks after policy meeting, including summary of discussions and individual votes.
- 3.c [1] Individual voting records included together with minutes.
- 4.a [1] Policy decisions announced the same day.
- 4.b [0.5] Explanation of policy decisions at time of announcement, but only when policy changes (and only since April 2001).
- 4.c [0] No explicit policy inclination.
- 5.a [1] Main operating instrument: Repo rate.
- 5.b [1] Short-term forecasts for inflation and output, and analysis of macroeconomic developments in quarterly *Inflation Report*. In addition, discussion of the MPC's forecasting record in the August *Inflation Report* (since 1999).
- 5.c [0.5] Evaluation of policy outcome only casually in quarterly *Inflation Report*.

Federal Reserve (<http://www.federalreserve.gov/>)

- 1.a [0.5] Multiple objectives without priority: "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates." *Federal Reserve Act* Sec. 225a.
- 1.b [0] No explicit target for objectives.
- 1.c [0.5] No explicit instrument independence in *Federal Reserve Act*.
- 2.a [1] All data available from the FRED database at the Federal Reserve Bank of St Louis web site (www.stls.frb.org).
- 2.b [1] Policy model described by Flint Brayton and Peter A. Tinsley (1996) "A Guide to FRB/US: A Macroeconomic Model of the United States", *Federal Reserve Board Finance and Economics Discussion Paper* 96-42.
- 2.c [0.5] Short-term economic projections for inflation and output are published in the semiannual *Monetary Policy Report to the Congress*.
- 3.a [0] No explicit monetary policy strategy could be found.
- 3.b [1] Non-attributed minutes, including discussion of arguments and individual votes, released about six weeks after policy meeting.
- 3.c [1] Individual voting records included together with minutes
- 4.a [1] Policy decisions announced the same day.
- 4.b [1] Explanation of all policy decisions at time of announcement including some forward-looking assessment.
- 4.c [1] Explicit phrase in statement after every meeting that describes the policy

tilt, explained in Federal Reserve Board Press Release "FOMC announced modifications of its disclosure procedures", January 19, 2000.

5.a [1] Annual evaluation of target for Federal Funds reveals near perfect control. *Domestic Open Market Operations During 2000*, Federal Reserve Bank of New York, Markets Group, February 2001.

5.b [0] Macroeconomic analysis and short-term forecasts for inflation and output in the semiannual *Monetary Policy Report to the Congress*.

5.c [0.5] Only informal evaluation of policy outcomes in the semiannual *Monetary Policy Report to the Congress*.

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Table 1: Index of Central Bank Transparency

Central Bank Transparency	Australia	Canada	Euro zone	Japan	New Zealand	Sweden	Switzerland	UK	US
1. Political	3	3	3	1.5	3	3	2.5	3	1
a. Formal Objectives	1	1	1	0.5	1	1	0.5	1	0.5
b. Quantitative Targets	1	1	1	0	1	1	1	1	0
c. Institutional Arrangements	1	1	1	1	1	1	1	1	0.5
2. Economic	1	2.5	2.5	1.5	2.5	2	1.5	2.5	2.5
a. Economic Data	0.5	1	1	1	0.5	1	1	0.5	1
b. Policy Models	0	1	1	0	1	0	0	1	1
c. Central Bank Forecasts	0.5	0.5	0.5	0.5	1	1	0.5	1	0.5
3. Procedural	1	1	1	2	3	2	1	3	2
a. Explicit Strategy	1	1	1	0	1	1	1	1	0
b. Minutes	0	0	0	1	1	1	0	1	1
c. Voting Records	0	0	0	1	1	0	0	1	1
4. Policy	1.5	2	1.5	1.5	3	2	2	1.5	3
a. Prompt Announcement	1	1	1	1	1	1	1	1	1
b. Policy Explanation	0.5	1	0.5	0.5	1	1	1	0.5	1
c. Policy Inclination	0	0	0	0	1	0	0	0	1
5. Operational	1.5	2	2	1.5	2	3	0.5	2.5	1.5
a. Control Errors	1	1	1	0.5	1	1	0.5	1	1
b. Transmission Disturbances	0.5	0.5	0.5	0.5	0.5	1	0	1	0
c. Evaluation Policy Outcome	0	0.5	0.5	0.5	0.5	1	0	0.5	0.5
Total	8	10.5	10	8	13.5	12	7.5	12.5	10