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Does Central Bank Transparency Reduce Interest Rates?*

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Abstract

Central banks have become increasingly transparent during the last decade. One of the main benefits of transparency predicted by theoretical models is that it enhances the credibility, reputation, and flexibility of monetary policy, which suggests that increased transparency should result in lower nominal interest rates. This paper exploits a detailed transparency data set to investigate this relationship for eight major central banks. It appears that for all central banks, the level of interest rates is affected by the degree of central bank transparency. In particular, the majority of the improvements in transparency are associated with significant effects on interest rates, controlling for economic conditions. In most of these cases, interest rates are lower, often by around 50 basis points, although in some instances transparency appears to have had a detrimental effect on interest rates.

Keywords: central bank transparency, monetary policy, interest rates
JEL classification: E52, E58

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1 Introduction

Central banks have become increasingly transparent and consider transparency a key feature of their monetary policy framework. Since central banks tend to be far more forthcoming than is needed to meet statutory accountability requirements, it is widely believed that transparency has considerable economic benefits. Theoretical models show that transparency has the potential to enhance the credibility, reputation and flexibility of monetary policy, which should enable central banks to set lower interest rates. The contribution of this paper is to investigate this theoretical prediction using a unique data set of transparency measures for major central banks from 1998 to 2002. We find that improvements in transparency indeed tend to be associated with significantly lower interest rates when controlling for economic conditions.

Intuitively, the advantages of transparency in the form of greater credibility, reputation and flexibility derive from the fact that transparency makes it easier for the private sector to infer the central bank's intentions from monetary policy decisions and outcomes. This allows a central bank to improve its credibility. It also gives the central bank a greater incentive to build reputation as private sector inflation expectations become more sensitive to monetary policy actions and outcomes that are not attributed to economic shocks. At the same time, transparency makes it clear when monetary policy decisions are intended to offset economic shocks, so it gives the central bank greater flexibility to stabilize the economy without affecting private sector inflation expectations.

These effects of transparency should influence the level of interest rates. In particular, enhanced flexibility would allow a reduction in policy and short term interest rates without increasing long term nominal interest rates, and improved reputation would reduce inflation expectations and thereby long term nominal interest rates. This paper tests empirically for the presence of such flexibility and reputation effects on interest rates, exploiting changes in the degree of central bank transparency over time based on an index by Eijffinger and Geraats (2004).

In many instances, improvements in transparency tend to coincide with lower interest rates, when controlled for the economic situation using inflation and output. The empirical results show significant reductions in interest rates for all countries in our sample: the Reserve Bank of Australia (RBA), 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 Federal Reserve (Fed). But there are some transparency increases that did not significantly influence interest rates, or had detrimental flexibility or reputation effects. In some cases there appears to be a trade-off between flexibility and reputation.

There is an increasing number of empirical studies suggesting that central bank transparency is beneficial. The move towards greater transparency appears to have reduced

the effect of monetary policy actions on financial markets in the UK ((Haldane and Read 2000); (Clare and Courtenay 2001)) and Canada (Muller and Zelmer 1999). In Australia interest rate volatility at the short end has decreased, and anticipation of changes in monetary policy has improved since the increase in transparency that took place in the late 1980s (Coppel and Connolly 2003). US bond markets have become more efficient and less volatile since the Fed introduced policy transparency in 1994 (Rafferty and Tomljanovich 2002). These beneficial findings for the US are confirmed by several other papers. Poole and Rasche (2003) show that the increase in the level of transparency of the Fed led to improved understanding of what the Federal Open Market Committee (FOMC) is doing, indicated by the smaller average size of market surprises. Swanson (2004) demonstrates that since the late 1980s it has become easier for US financial markets and private sector forecasters to forecast the future monetary policy of the Fed, which is most likely partly a result of more transparency. Kohn and Sack (2003) present results that indicate that market interest rates are affected both by the statements released by the FOMC and by the congressional testimony by Greenspan. Besides the information about short term policy inclination, the economic outlook that is presented contains important information for the market.

In contrast to this finding for the US, Reeves and Sawicki (2005) show that market reactions in response to the speeches and testimony to parliamentary committees are more difficult to find in the UK. Instead, significant reactions to MPC minutes and the inflation report, which are more collective forms of communication, can be found, and therefore the latter form of communication seems to contain more significant new information about the policy and economic outlook. Based on data from 20 countries, Fracasso, Genberg and Wyplosz (2003) find that higher quality inflation reports are associated with smaller market interest rate surprises from monetary policy decisions. Siklos (2000) analyses the effect of the adoption of inflation targeting and the publication of an inflation report by applying 1988-1999 panel data on 12 countries and finds some evidence that both forms of transparency appear to be beneficial, in the sense of reducing inflation forecasts. Furthermore, there is cross-section evidence that the publication of forward-looking analysis by central banks reduces average inflation and diminishes the sacrifice ratio (Chortareas, Stasavage and Sterne (2002a), (2002b), (2003)). The publication of MPC voting records in the UK has made it easier to predict future monetary policy decisions (Gerlach-Kristen 2004).

A potential downside of more transparency is pointed out by the empirical research of Meade and Stasavage (2004). They show that the decision in 1993 to release the full transcripts of meetings of the Federal Reserve´s FOMC, made its members more reluctant to offer dissenting opinions about the short term interest rates and on the bias for future policy.

Ehrman and Fratcher (2005a) find that for the Federal Reserve and the ECB, which have different communication strategies (individual accountability versus a more collegiate communication approach), the predictability of policy decisions and the responsiveness of financial markets are equally good. Their results suggests that there may not be a single best approach, the most effective way of communication depends on the particular circumstances and the environment a central bank faces. Wilhelmsen and Zaghini (2005) argue as well that the predictability of monetary policy conducted by the ECB is comparable to that of the central banks of the US and the UK. Ehrman and Fratcher (2005b) show that the ability of the market to anticipate monetary policy decisions and the future path of interest rates is influenced by the manner in which and on what the central bank communicates. When analysing the effects of communication by the Bank of England, the Federal Reserve, and the ECB, they find that communicating the disagreement between committee members about the monetary policy explains, on average, one third to one half of the prediction errors of FOMC policy decisions of the market. In contrast, based on US findings, communicating different points of views about the economic outlook seems to be beneficial because it makes it easier to anticipate the future interest rate path.

Van der Cruijsen and Demertzis (2006) use detailed time-series data on the transparency of nine major central banks to analyse the effect of central bank transparency on the degree to which private sector inflation expectations are anchored. They find some evidence that central bank transparency can help pin down inflation expectations. The present paper uses detailed time-series data on transparency as well, but is the first one to use it to investigate the effects of various transparency changes on the level of the short and long term nominal interest rates.

In the next section a simple model that captures the flexibility and reputation effects of transparency on short and long nominal interest rates is presented. Then, section 3 describes the data used in the empirical analysis, including the transparency measures. The empirical results are presented in section 4, and conclusions are drawn in section 5.

2 Stylized Model

We use a highly stylized model to illustrate the flexibility and reputation effects of central bank transparency on interest rates. Geraats (2000) shows how transparency enhances flexibility and reputation in a more sophisticated, dynamic model.[1] For a comprehensive

[1]It should be noted that some theoretical papers, including Cukierman (2001) and Jensen (2002), find that transparency reduces flexibility. This occurs when the private sector learns about supply shocks before it forms its inflation expectations that affect the contemporaneous Phillips curve. This induces a worsening of the inflation-output tradeoff.

survey of the literature on transparency of monetary policy, see Geraats (2002).

Suppose the central bank has an inflation target τ, about which the public has imperfect information. In particular, the public has a Bayesian prior on the inflation target such that $\tau \sim N(\bar{\tau}, \sigma_\tau^2)$. Uncertainty about the target, or imperfect credibility, is reflected by $\sigma_\tau^2 > 0$. In addition, suppose that the central bank suffers from a reputation problem in the sense that the prior mean exceeds the actual inflation target: $\bar{\tau} > \tau$. The monetary policy instrument set by the central bank is the short term nominal interest rate s:

$$s = c - \tau + \varepsilon \tag{1}$$

where $c > 0$ is a constant reflecting the 'neutral' policy rate, and $\varepsilon \sim N(0, \sigma_\varepsilon^2)$ is an economic shock that the central bank decides to offset, which is independent of τ. In this short term model, a higher inflation target τ leads to expansionary monetary policy and reduces the short term interest rate s due to the liquidity effect. The long term nominal interest rate is determined by the long real interest rate r and private sector inflation expectations z, so

$$l = r + z \tag{2}$$

A higher level of inflation z anticipated by the public increases the long term nominal interest rate l due to the Fisher effect.[2] The public has rational expectations and uses the policy rate s as a signal of the central bank's inflation target τ, so that

$$z = \mathrm{E}_P[\tau|s] \tag{3}$$

where $\mathrm{E}_P[\tau|s]$ denotes the private sector's posterior mean of the inflation target.

In the case of transparency (denoted by superscript T), the central bank conveys to the private sector (e.g. by publishing forecasts, minutes or policy explanations) what economic shocks ε it is responding to. This means that the public can perfectly infer the central bank's intention τ from the policy instrument s, so that the long term nominal interest rate equals

$$l^T = r + \tau \tag{4}$$

In the case of opacity (denoted by superscript O), the economic disturbance ε is not observed by the private sector. As a consequence, the public engages in Bayesian updating, or equivalently, solves a signal-extraction problem when it tries to infer the central bank's inflation target τ from the policy instrument s. So, the long term nominal

[2]Note that over time, this also increases short term inflation expectations (which are fixed in the short term) and thereby raises the neutral policy rate c. Thus, the policy rate s would increase in the long run, which would make (1) and (2) consistent with the expectations theory of the term structure.

interest rate equals[3]

$$l^O = r + \frac{\sigma_\varepsilon^2}{\sigma_\tau^2 + \sigma_\varepsilon^2}\bar{\tau} - \frac{\sigma_\tau^2}{\sigma_\tau^2 + \sigma_\varepsilon^2}(s - c) \tag{5}$$

This shows that a change in the short interest rate affects the long interest rate in the opposite direction, thereby tilting the yield curve. Substituting (1) into (5) gives

$$l^O = r + \tau + \frac{\sigma_\varepsilon^2}{\sigma_\tau^2 + \sigma_\varepsilon^2}(\bar{\tau} - \tau) - \frac{\sigma_\tau^2}{\sigma_\tau^2 + \sigma_\varepsilon^2}\varepsilon \tag{6}$$

A comparison of the outcomes under transparency (4) and opacity (6) reveals two differences. First, under opacity, the stabilization of economic shocks is complicated by the effect on the long term interest rate. For instance, suppose the central bank would like to offset a negative demand shock $\varepsilon < 0$ by reducing the policy rate s. The lack of transparency causes the private sector to partly attribute the lower interest rate s to a high inflation target τ. This increases the long term nominal interest rate l, which hampers the central bank's ability to stimulate the economy. In contrast, in the presence of transparency, the long rate remains stable, thereby providing the central bank greater flexibility to offset economic disturbances without compromising its credibility.

Second, greater transparency allows the private sector to more accurately infer the central bank's inflation target τ from the policy rate s, which leads to lower inflation expectations z and reduces the long term nominal rate l (as $\bar{\tau} > \tau$). However, under opacity, private sector expectations are less responsive to policy actions, so the central bank finds it much more difficult to improve its reputation. Similar in spirit, transparency could make it easier for the private sector to infer the inflation target τ from inflation outcomes (e.g. by publishing unanticipated transmission disturbances). This would also reduce private sector inflation expectations z and thereby the long nominal rate l.

To summarize, transparency could generate two beneficial effects. It could provide the central bank greater flexibility to stabilize economic shocks by reducing the short term interest rate without risking a loss of reputation in the form of higher long term nominal rates. In addition, it could have a desirable reputation effect that lowers inflation expectations and the long term nominal interest rate. As a result, it is possible to distinguish between the flexibility and reputation effects of transparency.

3 Data

In this paper, the rich transparency database collected by Eijffinger and Geraats (2004) is exploited. In particular, changes in the Eijffinger and Geraats (2004) index are used to analyze the relation between transparency and interest rates over time. There are a

[3]Use the fact that for two jointly normal variables x and y, $\mathrm{E}[y|x] = \mathrm{E}[y] + \frac{\mathrm{Cov}\{y,x\}}{\mathrm{Var}[x]}(x - \mathrm{E}[x])$.

few other measures of transparency of monetary policy: Fry, Julius, Mahadeva, Roger and Sterne (2000) construct an index of 'policy explanations' based on a comprehensive survey of 94 central banks; Bini-Smaghi and Gros (2001) present an indicator of central bank transparency and accountability for six major central banks, and de Haan and Amtenbrink (2002) suggest a variation on this. However, these measures are all static, so they cannot be used for time series analysis.

The Eijffinger and Geraats (2004) index distinguishes five aspects of transparency relevant for monetary policymaking, each of which is quantified based on three criteria that refer to factual information disclosures.

1. Political (formal objectives, quantitative targets, and institutional arrangements).
2. Economic (data, models and internal forecasts used for policy decisions).
3. Procedural (strategy, minutes and voting records, capturing how policy decisions are made).
4. Policy (prompt announcement and explanation of policy actions, and policy inclination).
5. Operational (control errors, transmission disturbances, and formal evaluation of policy outcomes).

The index is constructed for nine major central banks (Reserve Bank of Australia, Bank of Canada, European Central Bank, Bank of Japan, Reserve Bank of New Zealand, Swedish Riksbank, Swiss National Bank, Bank of England, US Federal Reserve) for the period 1998-2002.

The Eijffinger and Geraats (2004) index shows a great variety in the degree of transparency, both across central banks and over time. The most transparent central banks are the Reserve Bank of New Zealand, the Swedish Riksbank and the Bank of England, which are all inflation targeters. However, the adoption of inflation targeting does not guarantee a high degree of transparency, as is shown by the fact that the Reserve Bank of Australia gets one of the lowest scores in the sample. Furthermore, many central banks have experienced significant improvements in transparency over time. Sweden, which has been an inflation targeter since 1993, achieved the most impressive advance in the transparency index from 1998 to 2002. These examples also show that the adoption of inflation targeting can be a very poor proxy for the degree of central bank transparency.

The empirical analysis investigates how the level of interest rates is affected by changes in transparency over time, controlling for the macroeconomic situation in the form of inflation and output. Changes in the Eijffinger and Geraats (2004) index are used to construct transparency indicator variables $d_{MM/YY}$ for each central bank that switch

from 0 to 1 on the date (coded as MM/YY) at which the change in index took place. This leads to 15 indicators which are supplemented by 4 indicators that capture major transparency events that occurred before the sample of Eijffinger and Geraats (2004). Appendix A.1 contains a list of all the transparency indicator variables, including a detailed description of the corresponding change in transparency and the aspect(s) it pertains to. The Bank of Canada was the only central bank that did not change any of its transparency scores over the sample, so it was dropped.

Three different interest rates, policy, short and long, are used in the analysis. The policy rate i_p is the interest rate that the central bank employs as its policy instrument or target. The short interest rate i_s is the three-month deposit rate or the money market rate. And the long nominal rate i_l is the nominal yield on 10-year government bonds. End of the quarter, quarterly data is used.

Two variables are used to control for macroeconomic conditions, inflation and the output gap. Inflation is measured as the annual percentage change in the Consumer Price Index (CPI). The measure for the output gap is the percentage deviation from the trend in Gross Domestic Product (GDP) computed using the Hodrick-Prescott (HP) filter. Further details about the data are available in the Appendix A.2.1.

To test whether the results still hold when monthly data are used, monthly regressions have been estimated as well. Monthly production data is available for five out of the eight central banks: the ECB, BoJ, SRB, BoE and the Fed. In several cases average data is used instead of end of the month data. Since changes in the interest rate take longer to affect average values, regressions with average rates use the one-month lagged value of the transparency indicator to facilitate comparability of the results across rates. So, for average rates, transparency changes in the first month of the year lead to a change in the indicator in the next month. See Appendix A.2.2 for more detailed information about the applied monthly data.

4 Empirical Results

This section starts with a detailed explanation of the empirical methods that we used to analyze the effect of central bank transparency on the flexibility and reputation of central banks. Thereafter, we discuss the results for each country.

4.1 Method

The empirical analysis of the effect of central bank transparency on the level of interest rates is complicated by two stylized facts: (i) interest rates tend to vary substantially over the business cycle by about 200-400 basis points; (ii) the degree of central bank

transparency has increased significantly over time but not uniformly across countries, as documented by Eijffinger and Geraats (2004). As a result, cross-section correlations between the (level or average of the) interest rate and transparency could be very misleading. Instead, we investigate how the level of the interest rate is affected by changes in transparency over time. Since the interest rate i depends on macroeconomic conditions, we include inflation (π) and the output gap (y) as control variables, as well as lagged interest rates to absorb serial correlation. The changes in transparency are captured by the indicator(s) $d_{MM/YY}$. This gives rise to the following backward looking specification:

$$i_t = c_0 + \sum_{l=1}^{L_\pi} c_{\pi,l}\pi_{t-l} + \sum_{l=1}^{L_y} c_{y,l}y_{t-l} + \sum_{l=1}^{L_i} c_{i,l}i_{t-l} + \sum\nolimits_{MM/YY} c_{MM/YY}d_{MM/YY,t} + \varepsilon_t \qquad (7)$$

where $i \in \{i_p, i_s, i_l\}$. Although this resembles the so-called Taylor rule, which has a structural interpretation as a policy reaction function, we focus on the conditional expectations interpretation of (7). We focus in particular on the question whether improvements in transparency are associated with a reduction in interest rates, controlling for macroeconomic conditions.

To control for expected future conditions as well, an additional specification is considered that also includes forward looking elements, in particular expected future values of inflation and output.

$$\begin{aligned} i_t \;=\; & c_0 + \sum_{l=1}^{L_\pi} c_{\pi,l}\pi_{t-l} + \sum_{l=1}^{L_y} c_{y,l}y_{t-l} + \sum_{l=1}^{L_i} c_{i,l}i_{t-l} \\ & + \sum_{k=0}^{K_\pi} c_{\pi,k}\pi_{t+k} + \sum_{n=0}^{K_y} c_{y,k}y_{t+n} + \sum\nolimits_{MM/YY} c_{MM/YY}d_{MM/YY,t} + \eta_t \end{aligned} \qquad (8)$$

where $\eta_t \equiv \varepsilon_t + \sum_{k=0}^{K_\pi} c_{\pi,k}\left(\mathrm{E}_t\left[\pi_{t+k}\right] - \pi_{t+k}\right) + \sum_{k=0}^{K_y} c_{y,k}\left(\mathrm{E}_t\left[y_{t+k}\right] - y_{t+k}\right)$ is white noise.

The main challenge in the estimation of (7) and (8) is to obtain results that pass the usual diagnostic tests (especially for autocorrelation). Instead of using a trial-and-error approach to try to find a suitable specification for each country and interest rate, we decided to adopt a more systematic method and used the automatic econometric model selection program PcGets, which is based on the *general-to-specific* methodology (Hendry 1995). For all countries and interest rates, (7) and (8) are used as the so-called 'General Unrestricted Models' (GUMs), which are starting point of the automatic selection of an undominated, congruent model based on the results of diagnostic tests.[4]

[4] *"Monte Carlo experiments demonstrate that PcGets recovers the correct specification from a general model with size and power close to commencing from the data-generating process (DGP) itself."* (Hendry and Krolzig (2001), p.3)

The sample period runs from 1993 through 2002, covering the decade in which some of the most interesting changes in transparency practices have taken place. Ending the sample in 2002 allows for the inclusion of forward looking explanatory variables based on more recent data (2002-2004). For the backward looking regressions with quarterly data (7), the number of lags in the GUM was set to $L_\pi = L_y = L_i = 5$. The same lags were used in the forward looking regressions with quarterly data (8), which also include several forward looking terms. A selection of forward looking terms had to be made because of the limited number of observations at our disposal. In that light, we included the current, one year ahead, and two years ahead inflation rate, $k \in \{0, 4, 8\}$, and the current and one year ahead output gap, $n \in \{0, 4\}$.

For the forward-looking regressions, several instruments are used to experiment with; lags up to two years of i_p, i_s, i_l, and if available of i_m (medium term interest rate), y and π. We experimented both with the lag length as well as with the combination of instruments (under the precondition that i_p and i_s were not used together because of multicollinearity). The selection of the set of instrument eventually depended on several factors: (i) whether the number of instruments was not too large, in the sense that they cause run time errors; (ii) whether the instruments were valid according to the Sargan test; (iii) whether the instruments have significant explanatory power for the explanatory endogenous variables; (iv) whether the p-values of the diagnostic tests of the specific model were, if possible, at least 0.025 (which is in line with our initial settings). The null hypothesis of the Sargan test is that the instrumental variables are valid, uncorrelated to some set of residuals, and therefore the instruments appear to be healthy. This test is asymptotically distributed as $\chi^2(q)$ when the q over-identifying instruments are independent of the regression error. The selection criteria we used is whether the p-value of this test is $\geqq 0.10$.

The backward looking regressions are estimated by Ordinary Least Squares (using GETS), whereas the forward looking regressions with endogenous explanatory variables π_{t+k} and y_{t+n}, for $k \in \{0, 4, 8\}$ and $n \in \{0, 4\}$, are estimated with Instrumental Variables (using GETSIVE). In our baseline scenario all transparency dummies are forced to be included in the selected specific model. The selection strategy that is chosen is the built-in sample size adjusted liberal strategy. This strategy focuses on minimizing the non-selection probability of variables that are relevant.[5]

[5]Only two adjustments were made to this setting. In light of the relatively limited sample size, the loosest significance level for the diagnostic tests was increased from 0.01 to 0.025. In addition, a heteroskedasticity test was activated (in addition to the standard tests in PcGets, namely Chow tests, normality test, autocorrelation test, and autoregressive conditional heteroskedasticity test). If a diagnostic test is violated for the GUM at the set significance level, then PcGets discards this test and no longer reports it, in which case any missing diagnostics tests were obtained separately for each selected specific model.

In addition to the regressions that were performed with quarterly data, regressions with monthly data were carried out as well. As mentioned before, monthly data is available for five out of eight central banks: the ECB, the BoJ, the SRB, the BoE and the Fed. To make the results, as much as possible, comparable with the quarterly regression results, the GUMs are constructed in a analogous manner. Therefore $L_\pi = L_y = L_i = 15$, and $k \in \{0, 12, 24\}$ and $n \in \{0, 12\}$. The instruments include lags up to 24 periods (so as before the instruments go two years back in time).

Tables 1-13 with regression results show the coefficient estimates with p-values in brackets. The Wald statistic for the joint test that $d_{MM/YY} = 0$ for all k transparency indicators is reported, together with p-values in brackets. Indicator variables and Wald tests significant at the 10% level are presented in bold. The outcomes of several diagnostic test are reported in the result tables as well. Since the regressions include lagged dependent variables it is important to test for autocorrelation to ensure consistency of the coefficient estimates. The outcomes of the Lagrange-multiplier (LM) test for autocorrelation up to fourth order, that has a $\chi^2(4)$ distribution, including p-values in brackets are presented. The null hypothesis is that there is no autocorrelation; the errors are white noise. Another diagnostic test that is performed is a test for heteroskedasticity. The null hypothesis of this F-test is that there is unconditional homoskedasticity, see White (1980). In addition, it is tested for fourth-order autoregressive conditional heteroskedasticity in the residuals with a F-test, see Engle (1982). The normality test is a $\chi^2(2)$ test for whether the skewness and kurtosis of the residuals is in line with a normal distribution, which is the null hypothesis of the test, see Doornik and Hansen (1994). The final test presented is the Sargan test, which is explained before. The standard error of the regression (s.e.e.) and the R^2 give an indication of the goodness of fit of the regressions.

In addition to the baseline strategy that is applied in the regressions with quarterly data, two other settings are used to check for the robustness of the obtained results. In the first one, the transparency dummies are not forced to reappear in the selected model. In the second alternative specification, we use a conservative instead of a liberal selection strategy. This strategy is built-in as well but in contrast to the liberal strategy it focuses on minimizing the non-deletion probability of nuisance variables. The results of these two robustness checks are presented in Appendix A.3 (Tables 16-19).

The results for each of the eight central banks are now discussed in turn.

4.2 Country Specific Results

Reserve Bank of Australia

The Reserve Bank of Australia (RBA) only experienced one (minor) improvement to transparency. It clarified in October 2001 that it uses a particular macroeconometric

model for policy analysis. This model had already been published by the Bank as a research discussion paper without receiving its formal endorsement.

The regression results in Table 1 indicate that this transparency increase was beneficial. It went along with lower short term and policy rates which indicate increased flexibility. The reputation of the RBA did not change. These findings still hold when the forward looking GUM is used. The robustness checks, presented in Appendix A.3, support these findings. The effect that we found seems to be too strong for such a minor transparency increase. One reason for the larger than expected coefficients could be that we are picking up the 9/11 effect.

European Central Bank

The European Central Bank (ECB) has become more transparent in two respects. It started releasing semiannual medium term staff projections for inflation and output in December 2000 and it published its structural macroeconomic model of the euro zone.[6] In addition, in November 2001 the ECB started providing policy explanations after each monetary policy meeting by reducing the frequency of meetings from twice to once a month so that each monetary policy meeting is followed by a press conference.

Considering the major change that took place with the start of the European Monetary Union (EMU) in January 1999, we introduced an additional indicator variable EMU to investigate its effect.

The results in Table 2 show many significant coefficients for transparency. The increase in economic transparency, indicated by $d_{12/00}$, went along with lower interest rates. Only in one instance, the backward looking case with long term rates, the effect was significant. This gives some minor support for a beneficial reputation effect. The policy transparency increase, indicated with $d_{11/01}$, went along with significantly lower policy rates (for which we used Eonia to ensure comparability before and after EMU) in the backward looking specification. When the forward looking GUM is applied, the coefficient on the transparency indicator $d_{11/01}$ is significant and sizeable in all three kinds of interest rate regressions. These results indicate that increased policy transparency has been beneficial, both for the flexibility as well as for the reputation of the ECB. The backward looking regressions indicate that the start of the EMU was not beneficial for reputation and flexibility of the ECB but this finding disappears when the forward looking specification is used. The robustness checks presented in Appendix A.3 support all

[6]It 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').

findings.

The results of the regressions with monthly data are presented in Table 3. They point out as well that the economic transparency increase went along with lower interest rates, but now there is a significantly beneficial flexibility effect which holds in the backward looking case as well as in the forward looking case. No significant effect could be found for the increase in policy transparency. The detrimental effect of the start of EMU is confirmed by both the backward looking results and the forward looking results.

All in all, the results suggest that both the increase in policy and economic transparency were beneficial to the ECB. The results indicate that the start of the EMU was detrimental.

Bank of Japan

The Bank of Japan (BoJ) became significantly more transparent in January 1998 when a new monetary policy framework was implemented in anticipation of the entry into force of an amendment to the Bank of Japan Law on April 1, 1998. Since January 1998, monetary policy decisions have been made at regular meetings of the Policy Board, which became autonomous and started publishing minutes of the monetary policy meetings. The amendment also specified price stability as the explicit aim of monetary policy, increased the effective independence of the Bank and required a semi-annual report on monetary policy to the Diet (parliament).

The BoJ also increased its transparency in October 2000 when it started publishing semi-annual short term forecasts for inflation and output made by the Policy Board. Finally, the Bank actually suffered from a decrease in its transparency score in March 2001 when it abandoned its use of the uncollateralized overnight call rate, which has been virtually zero since February 1999, to adopt the outstanding balance of current accounts at the Bank as its main operating target. Unfortunately, this quantitative target is quite loose and there are wide fluctuations that are not explained, creating opacity about control errors.

Table 4 shows that the changes in transparency of the BoJ appeared to have had only small effects on interest rates. None of the dummy coefficients are significant in the backward looking specification. Not much changes when forward looking term are added. Only in two instances some evidence is found for increased flexibility of the BoJ. This holds for the political and procedural transparency increases, indicated by $d_{01/98}$, in the regression with short rate data and for the operational transparency increase, indicated by $d_{03/01}$, in the regression with policy rate data. The coefficient of the operational transparency indicator $d_{10/00}$ is insignificant in all regressions.

The monthly regression results are reported in Table 5. As in the quarterly regressions, the operational transparency change had no significant impact. Again significant effects of the other transparency changes on flexibility can be found but these are, at least partly,

contrasting with earlier findings.

On the whole, the effects of the transparency change of the Bank of Japan seem to be small and only influencing flexibility. Part of the regressions suffer from normality problems, which is understandably a problem because the policy rate lies around zero. If we substantiate from these regression results we find some support for increased flexibility after the political, procedural and economic transparency increases.

Reserve Bank of New Zealand

The Reserve Bank of New Zealand (RBNZ) accomplished a major improvement in transparency in March 1999 when it abandoned the use of a target for the Monetary Conditions Index (MCI), which is a weighted average of the trade-weighted exchange rate and the 90-day interest rate, to convey its monetary policy stance. Instead, it introduced the Official Cash Rate, which is perfectly controlled and thereby eliminates operational uncertainty. In addition, it started to provide explanations of policy changes as well as quarterly, three-year ahead, unconditional forecasts for the 90-day interest rate. In addition, there was an increase in policy transparency in December 2000 when the RBNZ started to provide an explanation of policy decisions even when there is no adjustment of the Official Cash Rate.

The backward looking results in Table 6 show that the most recent policy transparency increase, indicated by $d_{12/00}$, reduced both policy (for which we used the overnight interbank rate to ensure comparability before and after adoption of the Official Cash Rate), short (the money market rate, which equals the policy rate) and long term rates. The coefficient of $d_{12/00}$ is significant in the backward looking long term rate regression and in the forward looking policy and short term rate regressions. The policy and operational transparency increases, indicated by $d_{03/99}$, had no significant impact.

Overall, the results of the RNBZ regressions support the idea that transparency increases can be beneficial for both flexibility and reputation. Note that these results should be interpreted with some care, because some of the regressions suffer from normality problems.

Swedish Riksbank

The Swedish Riksbank (SRB) experienced the greatest number of transparency events in our sample. The Riksbank started publishing its inflation forecasts in the quarterly Inflation Report in March 1997, enhancing economic transparency. Amendments to the Constitution Act and Sveriges Riksbank Act, which entered into force in January 1999, clarified the Riksbank's institutional independence and main objective. This was followed by policy explanations in the case of no-change decisions and the release of data on capacity utilization in the last quarter of 1999, which contributed to policy and economic transparency. Operational transparency was improved by an annual evaluation

of past inflation forecast errors, which started in March 2000. Finally, a policy inclination was first provided in March 2002, quickly followed by the disclosure of attributed votes in the minutes of the monetary policy meetings of the Executive Board.

The results of all the changes in transparency are shown in Table 7. Three out of five transparency changes seem to have had a significant impact on the flexibility and reputation of the SRB. The political transparency increase, indicated by $d_{01/99}$, is associated with higher flexibility at the cost of reputation. This finding holds both based on the backward looking and on the forward looking specification. Some evidence is found that the opposite holds for the procedural and policy increases which are indicated by $d_{03/02}$. The economic transparency increase, indicated by $d_{03/97}$, seems to have had a detrimental effect. These findings are robust in the sense that the regressions based on two other selection procedures, of which the results are presented in Appendix A.3, are in line with these findings. The only exception is the flexibility effect of the transparency changes indicated by $d_{03/02}$, for which the results do not give a clear picture.

In contrast, when monthly data is applied the results, presented in Table 8, differ on some points. The results suggest that transparency changes indicated by $d_{10/99}$ go along with decreased flexibility, whereas the operational transparency increase is followed with increased flexibility. The 1997 transparency increase was, again, followed by increased reputation but according to these results not at the cost of flexibility. In contrast to earlier findings, the political transparency increase, indicated by $d_{01/99}$, seems to have had a detrimental effect. Again some evidence is found that the most recent transparency increases, indicated by $d_{03/02}$, went along with lower long term interest rates, but the evidence on short term rates is again unclear.

All in all, the results of the SRB are mixed. Results that can be found both with quarterly as well as with monthly data are the increase in reputation after the 1997 transparency increase and the most recent transparency increases. In contrast, the 1999 political transparency increase was followed by lower long term rates. The Wald tests values are in almost all regressions significant, indicating that multicollinearity could be a problem. Therefore these results should be interpreted with some care.

Swiss National Bank

The Swiss National Bank (SNB) experienced a significant change in its monetary policy framework in December 1999, with the announcement of a quantitative definition of price stability, quickly followed by the entry into force of a constitutional amendment that enshrined the Bank's independence. In addition, the SNB started to release three-year ahead inflation forecasts at semiannual frequency. On the downside, it introduced an operational target range for the LIBOR of 100 basis points, without accounting for significant fluctuations, thereby reducing operational transparency.

The backward looking and forward looking regression results in Table 9 indicate that

the transparency increases went along with increased reputation. However, the flexibility effect is less clear. From the backward looking regressions flexibility seems to be reduced after the transparency increases, but when a more complete GUM with forward looking terms is used this is only supported by the regressions with short term interest rates, whereas the regressions with policy rate data contradict these findings. These findings are supported by the findings of the robustness check.

Overall, the results indicate that the transparency change by the SNB went along with increased reputation, whereas the effect on flexibility is less clear.

Bank of England

The Bank of England (BoE) was granted operational independence in 1997 and the first interest rate decision by the independent Monetary Policy Committee (MPC) was made in June 1997. This greatly reduced uncertainty about potential political influences in monetary policy. In addition, in April 1999 the Bank became remarkably open about the economic information it uses for policy decisions by publishing extensive documentation about its policy models and even the computer code of its macroeconometric model. In August 1999, operational transparency was enhanced by the introduction of an annual evaluation of the MPC's forecasting record for inflation and output.

The regression results reported in Table 10 show that the increase in political transparency, indicated by $d_{06/97}$, has had a beneficial reputation effect. It was followed by a reduction in the long nominal interest rate of about at least 100 basis points but this came at the cost of flexibility. Note that this transparency event was truly exogenous as it resulted from the surprising move by the new Labor government in 1997 to grant the Bank of England independence. The coefficients of the economic transparency increase, indicated by $d_{04/99}$, and the operational transparency increase in August 1999, indicated by $d_{08/99}$, are not significant in the backward looking regression. The forward looking regressions indicate a detrimental flexibility effect of the operational transparency increase.

It is checked whether these results can be confirmed by monthly data. Based on these regressions, of which the results are presented in Table 11, it is again found that the operational independence was followed by lower long term rates at the cost of flexibility. It is now possible to find a significant effect of the economic transparency increase, in the forward looking regressions this increase was followed by significantly higher long term rates. In contrast, the operational transparency increase seems to have been beneficial for the reputation of the Bank of England and its suggested detrimental effect on the flexibility of the BoE is not confirmed.

Overall, we find that operational independence was beneficial for the reputation of the BoE, but at the cost of flexibility. In contrast, some support is found that the economic transparency increase was followed by higher long term rates. The evidence on the effect

of the operational transparency increase is not obvious and too scarce to put much weight on.

Federal Reserve

The Federal Reserve (Fed) first provided a prompt announcement of its Federal Funds rate decision in February 1994, thereby contributing to greater policy transparency. In addition, it became more forthcoming about its policy stance in May 1999 when it started to provide a brief explanation of every policy decision at the time of announcement, as well as an explicit policy inclination.

Table 12 shows that the first transparency event was followed by higher interest rates which is significant in part of the regressions. Although this may sound detrimental, it was actually the intended purpose of the Fed. In fact, after a long 1.5 year spell of a constant Federal Funds rate target, the Fed decided to promptly announce a 50 basis point increase to have the maximum effect. So, this transparency event was clearly endogenous to the interest rate decision. An alternative interpretation of the significant positive effects of $d_{02/94}$ is that interest rates in the first year of the sample were relatively low compared to economic conditions. The introduction of an explicit policy inclination in 1999, indicated by $d_{05/99}$, appeared to have enhanced the flexibility of the Fed as it is followed by a reduction of policy and short rates by about 50 basis points, controlling for inflation and output. In addition, it seems to have had an even larger beneficial reputation effect. The results found based on several other settings do not contradict these findings, as can be seen in Appendix A.3.

The regression results with monthly production data, see Table 13, support our findings but the magnitude of the effects seems to be smaller, about 20 basis points.

On the whole, we find evidence that supports the importance of central bank transparency.

An overview of the empirical findings of the estimations based on a backward looking GUM and quarterly data are provided in Table 14, the ones that result from the forward looking GUM with quarterly data can be found in Table 15. The regression results suggest that all Central Banks benefited at least once from increased transparency. Although central bank transparency seems to have been beneficial in a lot of cases, this statement does not always hold. In some cases, it went along with higher interest rates. Part of the transparency changes did not significantly affect any interest rates, which support the point of view that not all aspects of transparency are of the same relevance from an economic point of view.

5 Conclusion

Central bank transparency has become one of the key features of monetary policy frameworks during the last decade. Transparency is often alleged to provide monetary policymakers reputational advantages and greater flexibility to stabilize the economy. However, empirical evidence of such benefits has been sparse. This paper shows that increases in transparency over time often coincide with lower levels of policy, short and/or long nominal interest rates, controlling for macroeconomic conditions.

Some of the changes in transparency appear to have been driven by external, political influences, which suggests these events can be treated as exogenous and used to estimate the effect of transparency on interest rates. The empirical results presented in this paper suggest that several aspects of transparency could indeed provide greater flexibility in the form of lower short term interest rates, without endangering credibility. In addition, there is evidence that transparency could enhance the central bank's reputation and reduce long term nominal interest rates. The paper demonstrates that these effects can be economically significant. The empirical results show economically significant reductions in interest rates for all eight central banks in our sample. Nevertheless, not all transparency increases seem to have been beneficial. Sometimes there seems to be a trade-off between reputation and flexibility. In addition, part of the changes in transparency did not have a significant effect at all. The findings show that only part of the central banks in our sample faced detrimental transparency effects. When it is looked at the results based on the more complete forward looking GUM, of which a summary of the results is presented in Table 15, detrimental unexpected effects were only found for the BoE and the SRB, while the results of the SRB should be interpreted with care because they suffer from multicollinearity.

On the other hand, it must be acknowledged that many of the increases in transparency are not entirely the central bank's initiative, but also carefully timed and induced by economic circumstances. In these instances, our results indicate that central banks often prefer to become more transparent when interest rates are low compared to the macroeconomic situation. This is not surprising given the evidence that transparency has the potential to significantly improve flexibility and reputation.

This paper establishes that controlling for macroeconomic conditions, central bank transparency matters. On the whole, the scale tips in favour of transparency.

Table 1: Reserve Bank of Australia (Q)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
c	2.04	[0.00]	1.81	[0.00]			3.41	[0.00]	2.40	[0.00]		
i_{-1}	0.89	[0.00]	1.45	[0.00]	1.28	[0.00]	0.46	[0.00]	1.05	[0.00]	1.11	[0.00]
i_{-2}			-0.74	[0.00]	-0.27	[0.08]			-0.40	[0.00]	-0.59	[0.02]
i_{-3}			0.35	[0.07]							0.39	[0.02]
i_{-5}	-0.32	[0.00]	-0.38	[0.00]								
y_{-1}	0.30	[0.00]										
y_{-2}							0.27	[0.00]	0.19	[0.02]		
y_{-5}	-0.32	[0.00]	-0.15	[0.02]			-0.42	[0.00]	-0.25	[0.00]		
π_{-1}					-0.22	[0.07]					-0.27	[0.02]
π_{-2}			-0.14	[0.01]	0.30	[0.02]					0.29	[0.01]
π_{-4}			0.18	[0.00]								
π_{-5}	0.20	[0.00]			-0.19	[0.04]						
y							0.33	[0.00]	0.21	[0.04]		
y_{+4}									-0.30	[0.03]		
π							0.16	[0.00]				
π_{+4}											0.20	[0.00]
π_{+8}							-0.29	[0.00]	-0.16	[0.00]		
$d_{10/01}$: eco.	**-0.94**	[0.01]	**-0.43**	[0.06]	0.46	[0.25]	**-0.83**	[0.00]	**-0.54**	[0.00]	-0.25	[0.38]
normality	3.17	[0.21]	1.18	[0.56]	1.49	[0.47]	4.39	[0.11]	0.09	[0.96]	1.19	[0.55]
AR	1.61	[0.20]	2.53	[0.06]	1.70	[0.18]	1.22	[0.32]	1.37	[0.27]	0.50	[0.74]
ARCH	0.52	[0.72]	0.67	[0.62]	0.66	[0.63]	0.32	[0.86]	0.52	[0.72]	0.51	[0.73]
hetero	12.00	[0.36]	13.08	[0.60]	11.97	[0.37]	1.71	[0.14]	16.45	[0.35]	22.88	[0.04]
wald	**8.02**	[0.00]	**3.75**	[0.05]	1.35	[0.25]	**16.84**	[0.00]	**9.95**	[0.00]	0.79	[0.37]
Sargan							16.51	[0.79]	10.76	[0.90]	17.96	[0.46]
s.e.e.	0.35		0.27		0.59		0.32		0.26		0.54	
R^2	0.91		0.94		0.87		0.93		0.95		0.89	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-8}^{t=-6}\pi_t$, $\sum_{t=-8}^{t=-6}y_t$, $\sum_{t=-8}^{t=-6}i_{p_t}$ and $\sum_{t=-8}^{t=-1}i_{m_t}$, in (5): $\sum_{t=-8}^{t=-6}i_{s_t}$ and $\sum_{t=-8}^{t=-1}il_t$, and in (6): $\sum_{t=-8}^{t=-6}\pi_t$, $\sum_{t=-8}^{t=-6}y_t$, and $\sum_{t=-8}^{t=-6}il_t$.

Source: Appendix A.2.1.

Table 2: European Central Bank (Q)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
i_{-1}	0.51	[0.00]	0.81	[0.00]	0.95	[0.00]	0.45	[0.00]				
y_{-1}	0.42	[0.00]	0.27	[0.05]								
y_{-2}							0.53	[0.00]				
y_{-4}							-0.64	[0.00]				
y_{-5}	-0.54	[0.00]	-0.21	[0.00]								
π_{-1}							-0.39	[0.06]				
π_{-3}	0.47	[0.00]										
π_{-4}	0.44	[0.03]					0.63	[0.02]				
π_{-5}			0.34	[0.08]								
y											-1.20	[0.00]
y_{+4}									-1.01	[0.00]	-1.69	[0.02]
π							0.62	[0.00]	0.75	[0.01]		
π_{+4}							0.33	[0.13]	1.18	[0.00]	3.32	[0.00]
π_{+8}									0.75	[0.00]		
$d_{12/00:\ \text{eco.}}$	-0.21	[0.44]	-0.40	[0.15]	**-0.31**	[0.07]	-0.02	[0.94]	-0.60	[0.14]	-0.51	[0.64]
$d_{11/01:\ \text{policy}}$	**-0.45**	[0.08]	-0.16	[0.58]	-0.03	[0.88]	**-0.57**	[0.05]	**-1.85**	[0.00]	**-2.81**	[0.00]
EMU	**0.49**	[0.00]	**0.36**	[0.01]	**0.48**	[0.00]	-0.04	[0.89]	-0.64	[0.14]	0.28	[0.83]
normality	0.85	[0.65]	1.77	[0.41]	0.48	[0.79]	0.37	[0.83]	2.64	[0.27]	1.97	[0.37]
AR	1.37	[0.28]	0.51	[0.73]	1.16	[0.35]	2.30	[0.10]	1.77	[0.16]	1.00	[0.43]
ARCH	0.72	[0.59]	0.69	[0.60]	0.90	[0.48]	0.21	[0.93]	0.43	[0.79]	0.62	[0.65]
hetero	0.23	[0.99]	0.57	[0.83]	0.29	[0.92]	16.60	[0.48]	13.91	[0.24]	2.00	[0.11]
Wald	**17.38**	[0.00]	**6.84**	[0.08]	**19.66**	[0.00]	4.66	[0.20]	**160.1**	[0.00]	**28.15**	[0.00]
Sargan							15.71	[0.15]	20.32	[0.32]	14.36	[0.50]
s.e.e.	0.24		0.31		0.26		0.23		0.48		1.05	
R^2	0.95		0.97		0.96		0.95		0.93		0.42	
Sample	1995(2)-2002(4)		1993(1)-2002(4)		1995(2)-2002(4)		1995(2)-2002(4)		1993(1)-2002(4)		1995(2)-2002(4)	

Note: P-values are in brackets. The indicator variable EMU takes on the value 1 as from 1999Q1. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-5}^{t=-1} i_{l_t}$, in (5): $\sum_{t=-8}^{t=-6} \pi_t$, $\sum_{t=-8}^{t=-6} y_t$, and $\sum_{t=-8}^{t=-6} i_{s_t}$, and in (6): $\sum_{t=-5}^{t=-1} i_{p_t}$.

Source: Appendix A.2.1.

Table 3: European Central Bank (M)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
c							0.80	[0.00]	0.24	[0.03]		
i_{-1}	0.61	[0.00]	0.96	[0.00]	0.98	[0.00]	0.42	[0.00]	0.89	[0.00]	0.98	[0.00]
i_{-2}	0.34	[0.00]										
i_{-3}							0.27	[0.00]				
i_{-7}									0.09	[0.13]		
i_{-8}			-0.06	[0.03]								
i_{-10}	-0.16	[0.01]					-0.19	[0.00]	-0.22	[0.01]		
i_{-11}									0.11	[0.25]		
i_{-12}									0.22	[0.03]		
i_{-13}	0.19	[0.00]							-0.19	[0.01]		
i_{-14}							0.28	[0.00]				
y_{-2}	0.09	[0.00]					0.08	[0.00]				
y_{-3}									0.03	[0.14]		
y_{-4}							0.10	[0.00]	0.05	[0.06]		
y_{-6}									-0.03	[0.17]		
y_{-7}			-0.05	[0.02]					-0.10	[0.00]		
y_{-9}	-0.06	[0.00]	0.07	[0.00]			-0.08	[0.00]	0.05	[0.05]		
y_{-11}									0.03	[0.19]		
y_{-12}							0.06	[0.04]				
y_{-14}			-0.06	[0.00]					-0.05	[0.02]		
π_{-2}			0.19	[0.00]								
π_{-3}									0.41	[0.00]		
π_{-4}			-0.17	[0.02]			0.15	[0.02]	-0.36	[0.00]		
π_{-7}									-0.11	[0.12]		
π_{-10}	0.16	[0.03]	0.20	[0.02]			0.24	[0.00]	0.35	[0.00]		
π_{-11}			-0.31	[0.00]					-0.39	[0.00]		
π_{-13}									0.11	[0.08]		
π_{-14}			0.20	[0.00]								
π_{-15}	-0.17	[0.04]					-0.27	[0.00]				

Table 3: European Central Bank (M) (continued)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
y							0.10	[0.00]				
π_{+12}									0.20	[0.00]		
π_{+24}							-0.15	[0.02]	-0.08	[0.24]		
$d_{12/00}$: eco.	-0.12	[0.22]	**-0.22**	[0.00]	-0.09	[0.15]	**-0.26**	[0.01]	-0.11	[0.20]	-0.09	[0.15]
$d_{11/01}$: policy	-0.03	[0.77]	0.00	[0.96]	0.01	[0.84]	-0.08	[0.41]	0.10	[0.21]	0.01	[0.84]
EMU	**0.13**	[0.05]	**0.13**	[0.01]	**0.15**	[0.00]	**0.21**	[0.01]	-0.12	[0.16]	**0.15**	[0.00]
normality	0.99	[0.61]	36.21	[0.00]	1.02	[0.60]	5.02	[0.08]	5.07	[0.08]	1.02	[0.60]
AR	2.13	[0.08]	0.49	[0.75]	0.60	[0.66]	1.90	[0.12]	0.29	[0.88]	0.60	[0.66]
ARCH	0.69	[0.60]	0.20	[0.94]	0.31	[0.87]	1.77	[0.14]	0.70	[0.60]	0.31	[0.87]
hetero	18.47	[0.49]	12.42	[0.96]	4.30	[0.51]	33.17	[0.27]	51.34	[0.24]	4.30	[0.51]
Wald	4.79	[0.19]	**11.52**	[0.01]	**15.14**	[0.00]	**10.88**	[0.01]	**7.92**	[0.05]	**15.14**	[0.00]
Sargan							52.19	[0.51]	33.69	[0.71]	69.14	[0.37]
s.e.e.	0.16		0.15		0.17		0.14		0.14		0.17	
R^2	0.97		0.99		0.98		0.98		0.99		0.98	
Sample	1995(4)-2002(12)		1993(1)-2002(12)		1995(4)-2002(12)		1995(4)-2002(12)		1993(1)-2002(12)		1995(4)-2002(12)	

Note: P-values are in brackets. The indicator variable EMU takes on the value 1 from 1999M1. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, and $\sum_{t=-6}^{t=-1} i_{l_t}$, in (5): $\sum_{t=-24}^{t=-16} \pi_t$ and $\sum_{t=-24}^{t=-16} y_t$, and in (6): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, and $\sum_{t=-6}^{t=-1} i_{s_t}$.

Source: Appendix A.2.2.

Table 4: Bank of Japan (Q)

	backward looking						forward looking					
	i_p (1)		i_s (2)		il (3)		i_p(4)		i_s (5)		il (6)	
c									0.31	[0.10]		
i_{-1}			1.19	[0.00]	0.63	[0.00]			0.84	[0.00]	0.48	[0.00]
i_{-2}			-0.47	[0.00]					-0.32	[0.06]		
i_{-3}							0.53	[0.00]				
i_{-4}	0.57	[0.00]										
i_{-5}			0.14	[0.02]	0.23	[0.02]	0.25	[0.04]	0.21	[0.00]	0.39	[0.00]
y_{-1}							-0.57	[0.00]				
y_{-2}					-0.10	[0.04]	0.45	[0.00]				
y_{-3}							-0.66	[0.00]			-0.18	[0.00]
y_{-4}							0.65	[0.00]	-0.08	[0.04]		
y_{-5}							-0.30	[0.01]				
π_{-2}	0.27	[0.01]					0.24	[0.05]				
y							0.49	[0.00]				
y_{+4}									-0.13	[0.04]		
π_{+8}							-0.34	[0.01]	-0.10	[0.09]	-0.25	[0.02]
$d_{01/98}$: polit./proc.	-0.14	[0.50]	0.02	[0.85]	-0.05	[0.79]	-0.06	[0.78]	**-0.19**	[0.04]	-0.24	[0.23]
$d_{10/00}$: eco.	0.35	[0.19]	-0.03	[0.74]	0.07	[0.80]	0.32	[0.21]	-0.26	[0.14]	0.20	[0.47]
$d_{03/01}$: oper.	0.00	[0.98]	-0.01	[0.90]	0.18	[0.53]	**-0.31**	[0.09]	-0.17	[0.35]	0.11	[0.69]
normality	13.36	[0.00]	14.62	[0.00]	4.72	[0.09]	6.14	[0.05]	0.01	[0.99]	3.66	[0.16]
AR	3.23	[0.03]	0.62	[0.65]	0.88	[0.49]	1.80	[0.16]	1.99	[0.13]	1.03	[0.41]
ARCH	0.66	[0.63]	0.65	[0.63]	0.89	[0.48]	0.34	[0.84]	0.69	[0.61]	1.32	[0.29]
hetero	1.47	[0.22]	1.05	[0.44]	1.21	[0.33]	0.45	[0.89]	1.06	[0.46]	17.63	[0.09]
Wald	2.29	[0.51]	0.13	[0.99]	0.63	[0.89]	**11.51**	[0.01]	**9.56**	[0.02]	1.98	[0.58]
Sargan							13.50	[0.14]	12.54	[0.40]	23.74	[0.42]
s.e.e.	0.44		0.17		0.36		0.36		0.15		0.34	
R^2	0.88		0.97		0.92		0.94		0.98		0.93	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4) and (5): $\sum_{t=-8}^{t=-6} \pi_t$ and $\sum_{t=-8}^{t=-6} y_t$, and in (6): $\sum_{t=-8}^{t=-6} \pi_t$, $\sum_{t=-8}^{t=-6} y_t$, $\sum_{t=-8}^{t=-6} i_{l_t}$, and $\sum_{t=-5}^{t=-1} i_{s_t}$.

Source: Appendix A.2.1.

Table 5: Bank of Japan (M)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p(4)		i_s (5)		i_l (6)	
c							-1.55	[0.00]	0.09	[0.15]		
i_{-1}	0.46	[0.00]	1.06	[0.00]	1.03	[0.00]	0.71	[0.00]	0.98	[0.00]	1.01	[0.00]
i_{-2}	0.17	[0.07]					0.36	[0.06]				
i_{-3}					-0.27	[0.00]	0.26	[0.18]			-0.29	[0.00]
i_{-4}			-0.17	[0.00]					-0.18	[0.09]		
i_{-5}					0.29	[0.00]			0.04	[0.78]	0.25	[0.00]
i_{-6}	0.26	[0.00]					0.44	[0.02]	0.12	[0.34]		
i_{-7}					-0.27	[0.00]	0.15	[0.39]	-0.03	[0.79]	-0.16	[0.01]
i_{-8}	-0.10	[0.21]					-0.15	[0.39]				
i_{-9}							-0.15	[0.41]	-0.21	[0.02]		
i_{-10}			0.20	[0.01]	0.24	[0.01]			0.30	[0.01]	0.19	[0.00]
i_{-11}			-0.27	[0.00]	-0.26	[0.03]	-0.09	[0.53]	-0.07	[0.33]		
i_{-12}	0.26	[0.00]			0.20	[0.02]	0.27	[0.09]				
i_{-13}	-0.28	[0.00]					-0.52	[0.00]				
i_{-14}	0.11	[0.18]	0.11	[0.01]								
y_{-1}									0.02	[0.01]	-0.05	[0.00]
y_{-2}							-0.03	[0.56]			0.06	[0.00]
y_{-5}			-0.01	[0.12]					-0.03	[0.00]		
y_{-6}									0.01	[0.19]		
y_{-7}					-0.04	[0.00]	-0.12	[0.01]			-0.04	[0.01]
y_{-8}												
y_{-9}							0.07	[0.12]				
y_{-10}			0.02	[0.01]			0.07	[0.12]	0.01	[0.44]	-0.04	[0.01]
y_{-11}					0.05	[0.00]					0.07	[0.00]
y_{-12}	-0.06	[0.00]	-0.02	[0.00]								
y_{-13}	0.05	[0.01]										
y_{-14}					-0.04	[0.00]						
π_{-1}	0.03	[0.59]			0.11	[0.04]						
π_{-2}					-0.11	[0.05]	0.10	[0.44]				
π_{-4}												
π_{-6}	0.06	[0.20]			-0.12	[0.04]					-0.08	[0.02]

Table 5: Bank of Japan (M) (continued)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p(4)		i_s (5)		i_l (6)	
π_{-7}					0.17	[0.02]			0.02	[0.53]		
π_{-8}			-0.05	[0.06]	-0.16	[0.02]			-0.05	[0.14]		
π_{-9}			0.07	[0.00]	0.16	[0.00]	-0.25	[0.04]	0.07	[0.01]		
π_{-11}							0.17	[0.27]				
π_{-12}							0.14	[0.47]				
π_{-13}	0.08	[0.27]					-0.13	[0.40]				
π_{-14}	-0.09	[0.17]			-0.07	[0.04]			0.00	[0.85]		
y							0.12	[0.05]				
y_{+12}							0.13	[0.00]	0.01	[0.05]		
π							0.45	[0.00]				
π_{+12}							0.26	[0.00]	-0.02	[0.19]	-0.06	[0.04]
π_{+24}							0.60	[0.00]	-0.07	[0.00]	-0.08	[0.02]
$d_{01/98}$: polit./proc.	-0.03	[0.77]	-0.03	[0.31]	-0.00	[0.98]	**1.64**	[0.00]	**-0.12**	[0.01]	-0.13	[0.13]
$d_{10/00}$: eco.	0.10	[0.45]	0.06	[0.17]	0.02	[0.85]	**0.69**	[0.06]	0.08	[0.21]	-0.06	[0.58]
$d_{03/01}$: oper.	0.00	[0.99]	0.01	[0.74]	0.04	[0.68]	0.45	[0.15]	-0.06	[0.29]	0.04	[0.67]
normality	74.87	[0.00]	47.40	[0.00]	6.62	[0.04]	6.96	[0.03]	29.79	[0.00]	2.49	[0.29]
AR	0.49	[0.75]	0.51	[0.73]	0.64	[0.64]	1.46	[0.22]	0.88	[0.48]	0.81	[0.52]
ARCH	0.16	[0.96]	0.11	[0.98]	0.66	[0.62]	0.67	[0.62]	0.68	[0.61]	1.21	[0.31]
hetero	45.59	[0.03]	35.02	[0.05]	46.75	[0.13]	61.94	[0.14]	60.38	[0.03]	42.20	[0.05]
Wald	0.75	[0.86]	2.06	[0.56]	0.52	[0.92]	**82.78**	[0.00]	**10.02**	[0.02]	**7.8**	[0.05]
Sargan							1.56	[1.00]	64.13	[0.21]	85.28	[0.14]
s.e.e.	0.26		0.09		0.19		0.49		0.09		0.20	
R^2	0.95		0.99		0.98		0.85		0.99		0.98	

Note: P-values are in brackets. Data period: 1993M1-2002M12. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-24}^{t=-16}\pi_t$ and $\sum_{t=-24}^{t=-16} i_{p_t}$, in (5): $\sum_{t=-24}^{t=-16} i_{s_t}$ and $\sum_{t=-24}^{t=-1} i_{l_t}$, and in (6): $\sum_{t=-24}^{t=-16}\pi_t$, $\sum_{t=-24}^{t=-16} y_t$, and $\sum_{t=-24}^{t=-1} i_{s_t}$.

Source: Appendix A.2.2.

Table 6: Reserve Bank of New Zealand (Q)

	backward looking						forward looking					
	$i_p(1)$		$i_s(2)$		$i_l(3)$		$i_p(4)$		$i_s(5)$		$i_l(6)$	
c	3.87	[0.00]	3.87	[0.00]	3.25	[0.00]	7.35	[0.00]	7.35	[0.00]	2.73	[0.01]
i_{-1}	0.85	[0.00]	0.85	[0.00]	0.84	[0.00]					0.66	[0.00]
i_{-2}	-0.38	[0.01]	-0.38	[0.01]	-0.36	[0.03]						
y_{-3}	0.37	[0.00]	0.37	[0.00]	0.12	[0.08]						
y_{-5}					-0.14	[0.04]						
π_{-2}					0.24	[0.02]						
y_{+4}											0.21	[0.06]
π							0.98	[0.00]	0.98	[0.00]		
π_{+4}							-0.52	[0.00]	-0.52	[0.00]	-0.21	[0.03]
π_{+8}							-0.56	[0.00]	-0.56	[0.00]		
$d_{03/99}$: policy/oper.	-0.63	[0.18]	-0.63	[0.18]	0.13	[0.63]	-0.05	[0.92]	-0.05	[0.92]	0.33	[0.24]
$d_{12/00}$: policy	-0.13	[0.76]	-0.13	[0.76]	**-0.69**	[0.04]	**-2.10**	[0.00]	**-2.11**	[0.00]	-0.40	[0.16]
normality	14.58	[0.00]	14.56	[0.00]	0.47	[0.79]	1.58	[0.45]	1.58	[0.45]	6.30	[0.04]
AR	0.30	[0.88]	0.30	[0.88]	2.71	[0.05]	2.83	[0.04]	2.83	[0.04]	1.59	[0.20]
ARCH	0.05	[1.00]	0.05	[1.00]	0.43	[0.78]	2.39	[0.08]	2.39	[0.08]	0.19	[0.94]
hetero	0.63	[0.75]	0.63	[0.75]	2.34	[0.05]	1.99	[0.09]	1.99	[0.09]	0.90	[0.53]
Wald	4.36	[0.11]	4.36	[0.11]	**6.39**	[0.04]	**26.95**	[0.00]	**26.97**	[0.00]	2.22	[0.33]
Sargan							19.44	[0.25]	19.43	[0.25]	22.51	[0.26]
s.e.e.	0.77		0.77		0.49		0.98		0.98		0.53	
R^2	0.83		0.83		0.73		0.73		0.73		0.66	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-8}^{t=-6} \pi_t$ and $\sum_{t=-8}^{t=-6} i_{p_t}$, in (5): $\sum_{t=-8}^{t=-6} \pi_t$ and $\sum_{t=-8}^{t=-6} i_{s_t}$, and in (6): $\sum_{t=-8}^{t=-6} \pi_t$, $\sum_{t=-8}^{t=-6} y_t$, and $\sum_{t=-8}^{t=-6} i_{l_t}$.

Source: Appendix A.2.1.

Table 7: Swedisch Riksbank (Q)

	backward looking						forward looking					
	i_p(1)		i_s(2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
i_{-1}	0.82	[0.00]	0.84	[0.00]	1.27	[0.00]	0.82	[0.00]	0.87	[0.00]	1.01	[0.00]
i_{-2}					-0.37	[0.01]					-0.43	[0.04]
i_{-3}											0.30	[0.02]
i_{-5}												
y_{-1}	0.34	[0.00]	0.34	[0.00]								
y_{-4}	-0.25	[0.00]	-0.25	[0.00]							-0.25	[0.00]
y_{-5}							-0.10	[0.04]				
π_{-1}	0.32	[0.00]	0.31	[0.00]								
π_{-3}					0.32	[0.00]						
π_{-4}	-0.18	[0.02]	-0.16	[0.03]								
π_{-5}	0.23	[0.00]	0.18	[0.01]							0.27	[0.00]
y							0.37	[0.00]	0.35	[0.00]		
y_{+4}									0.30	[0.00]		
π							0.38	[0.00]	0.37	[0.00]		
π_{+4}							0.16	[0.08]				
π_{+8}											-0.26	[0.02]
$d_{03/97}$: economic	**0.60**	[0.01]	**0.57**	[0.01]	0.30	[0.19]	**0.74**	[0.00]	**0.57**	[0.00]	**0.19**	[0.40]
$d_{01/99}$: political	**-0.39**	[0.08]	**-0.38**	[0.06]	**0.82**	[0.02]	**-0.75**	[0.00]	**-1.11**	[0.00]	**1.07**	[0.01]
$d_{10/99}$: eco./policy	0.11	[0.77]	0.09	[0.80]	-0.91	[0.13]	-0.20	[0.57]	-0.02	[0.94]	0.09	[0.88]
$d_{03/00}$: oper.	-0.13	[0.74]	-0.13	[0.72]	0.04	[0.95]	-0.33	[0.30]	0.13	[0.64]	-0.04	[0.95]
$d_{03/02}$: proc./policy	-0.15	[0.52]	-0.07	[0.74]	**-0.60**	[0.09]	0.27	[0.16]	**0.48**	[0.01]	**-1.14**	[0.00]
normality	3.67	[0.16]	0.83	[0.66]	6.55	[0.04]	1.28	[0.53]	0.65	[0.72]	0.29	[0.87]
AR	2.91	[0.04]	4.13	[0.01]	2.10	[0.11]	2.31	[0.08]	2.14	[0.10]	2.62	[0.06]
ARCH	0.53	[0.72]	1.16	[0.36]	1.65	[0.20]	0.52	[0.72]	0.46	[0.77]	1.26	[0.32]
hetero	0.72	[0.74]	0.93	[0.57]	0.71	[0.72]	0.73	[0.72]	1.29	[0.30]	0.37	[0.97]
Wald	**14.72**	[0.01]	**13.25**	[0.01]	**12.75**	[0.03]	**28.38**	[0.00]	**47.19**	[0.00]	**20.92**	[0.00]
Sargan							24.19	[0.11]	18.29	[0.31]	10.28	[0.51]
s.e.e.	0.31		0.28		0.50		0.27		0.26		0.49	
R^2	0.98		0.99		0.95		0.99		0.99		0.96	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-8}^{t=-6} i_p$, and $\sum_{t=-8}^{t=-1} i_{l_t}$, in (5): $\sum_{t=-8}^{t=-6} \pi_t$, $\sum_{t=-8}^{t=-6} y_t$, and $\sum_{t=-8}^{t=-6} i_{s_t}$, and in (6): $\sum_{t=-8}^{t=-6} \pi_t$, and $\sum_{t=-8}^{t=-6} y_t$.

Source: Appendix A.2.1.

Table 8: Swedisch Riksbank (M)

	backward looking						forward looking					
	$i_p(1)$		$i_s(2)$		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
c			0.24	[0.01]							0.93	[0.00]
i_{-1}	1.23	[0.00]	1.46	[0.00]	1.07	[0.00]	0.99	[0.00]	1.36	[0.00]	1.06	[0.00]
i_{-2}	-0.20	[0.00]	-0.51	[0.00]								
i_{-3}									-0.53	[0.00]		
i_{-4}					-0.11	[0.00]			0.04	[0.00]	-0.18	[0.00]
i_{-5}	-0.02	[0.00]							0.01	[0.00]		
i_{-6}									0.02	[0.00]		
i_{-7}	-0.01	[0.01]							0.01	[0.00]		
i_{-8}	-0.02	[0.00]	-0.01	[0.00]			-0.01	[0.03]	0.00	[0.07]		
i_{-9}									0.01	[0.00]		
i_{-10}									0.02	[0.00]		
i_{-11}									0.01	[0.00]		
i_{-12}									0.01	[0.01]		
i_{-13}									0.01	[0.00]		
i_{-14}									0.01	[0.00]		
i_{-15}							0.02	[0.00]	0.01	[0.00]		
y_{-1}									0.01	[0.05]		
y_{-3}			0.01	[0.00]					0.03	[0.00]		
y_{-4}					0.02	[0.01]					0.04	[0.00]
y_{-5}											-0.03	[0.00]
y_{-7}									0.02	[0.00]		
y_{-8}											0.02	[0.01]
y_{-9}							0.02	[0.00]			-0.02	[0.04]
y_{-12}	0.01	[0.00]					0.02	[0.00]	0.01	[0.04]		
y_{-13}			0.01	[0.00]	-0.03	[0.00]			0.01	[0.07]	-0.03	[0.00]
y_{-14}					0.02	[0.02]					0.02	[0.01]
y_{-15}	-0.02	[0.00]	-0.01	[0.09]					-0.01	[0.05]		
π_{-1}											-0.18	[0.00]
π_{-2}	0.07	[0.00]	0.06	[0.00]								
π_{-3}											-0.09	[0.05]
π_{-4}											0.17	[0.00]
π_{-5}					-0.07	[0.01]					-0.15	[0.00]

Table 8: Swedisch Riksbank (M) (continued)

	backward looking						forward looking					
	i_p(1)		i_s(2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
π_{-7}	-0.11	[0.00]										
π_{-8}	0.09	[0.00]			0.24	[0.00]	0.06	[0.00]	0.11	[0.00]	0.18	[0.00]
π_{-9}					-0.14	[0.00]						
π_{-10}											-0.10	[0.00]
π_{-11}							-0.10	[0.00]				
π_{-12}									0.09	[0.01]		
π_{-13}					0.08	[0.00]						
π_{-14}									-0.05	[0.06]		
y							0.03	[0.00]				
y_{+12}											-0.04	[0.00]
π									-0.08	[0.00]		
π_{+12}									-0.26	[0.00]		
π_{+24}							-0.05	[0.04]	-0.07	[0.02]		
$d_{03/97}$: economic	0.03	[0.48]	-0.05	[0.28]	0.05	[0.45]	0.01	[0.82]	-0.01	[0.90]	**-0.36**	[0.01]
$d_{01/99}$: political	0.01	[0.83]	-0.04	[0.43]	**0.36**	[0.00]	0.05	[0.52]	**0.50**	[0.00]	**0.22**	[0.05]
$d_{10/99}$: econ./policy	0.13	[0.15]	0.09	[0.19]	-0.19	[0.13]	**0.20**	[0.04]	**0.28**	[0.00]	-0.16	[0.19]
$d_{03/00}$: operational	**-0.19**	[0.02]	**-0.14**	[0.02]	-0.11	[0.35]	**-0.21**	[0.02]	-0.05	[0.58]	-0.19	[0.10]
$d_{03/02}$: proc./policy	-0.00	[0.99]	0.00	[0.99]	**-0.28**	[0.00]	**0.14**	[0.07]	**-0.42**	[0.00]	-0.05	[0.61]
normality	10.05	[0.01]	3.29	[0.19]	2.57	[0.28]	4.30	[0.12]	6.47	[0.04]	2.29	[0.32]
AR	1.34	[0.26]	1.88	[0.12]	0.29	[0.88]	0.76	[0.55]	2.88	[0.03]	1.84	[0.13]
ARCH	0.20	[0.94]	1.88	[0.12]	0.71	[0.59]	0.39	[0.81]	0.38	[0.82]	0.22	[0.93]
hetero	17.09	[0.88]	32.45	[0.03]	32.63	[0.09]	20.07	[0.64]	54.25	[0.58]	46.33	[0.14]
Wald	6.51	[0.26]	**12.73**	[0.03]	**26.12**	[0.00]	**19.32**	[0.00]	**100.5**	[0.00]	**39.02**	[0.00]
Sargan							83.94	[0.20]	32.86	[0.84]	40.26	[0.55]
s.e.e.	0.15		0.11		0.22		0.16		0.15		0.20	
R^2	0.96		1.00		0.99		0.99		1.00		0.99	

Note: P-values are in brackets. Data period: 1993M1-2002M12. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-24}^{t=-16}\pi_t$, $\sum_{t=-24}^{t=-16}y_t$, $\sum_{t=-24}^{t=-16}i_{p_t}$, and $\sum_{t=-15}^{t=-1}i_{l_t}$, in (5): $\sum_{t=-24}^{t=-16}\pi_t$, $\sum_{t=-24}^{t=-16}y_t$, and $\sum_{t=-24}^{t=-16}i_{s_t}$, and in (6): $\sum_{t=-24}^{t=-16}\pi_t$ and $\sum_{t=-24}^{t=-1}i_{l_t}$.

Source: Appendix A.2.2.

Table 9: Swiss National Bank (Q)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
c	0.92	[0.00]	0.79	[0.00]	1.42	[0.00]	2.16	[0.00]			1.42	[0.00]
i_{-1}					0.95	[0.00]			0.51	[0.00]	0.72	[0.00]
i_{-4}					-0.36	[0.00]						
y_{-1}	0.32	[0.05]									0.31	[0.02]
y_{-2}	-0.42	[0.01]									-0.20	[0.09]
y_{-5}			-0.29	[0.00]					-0.34	[0.00]		
π_{-2}			0.20	[0.07]	0.26	[0.00]					0.18	[0.01]
π_{-4}									0.21	[0.02]		
π_{-5}							0.60	[0.00]				
y							1.22	[0.00]				
y_{+4}											0.16	[0.03]
π							0.58	[0.00]	0.40	[0.00]		
π_{+4}									0.23	[0.03]		
π_{+8}							-0.67	[0.00]			-0.47	[0.00]
$d_{12/99}$: polit./ eco./oper.	0.13	[0.46]	**0.38**	[0.01]	**-0.39**	[0.01]	**-1.68**	[0.00]	**0.38**	[0.01]	**-0.50**	[0.01]
normality	0.09	[0.96]	1.31	[0.52]	2.06	[0.36]	2.17	[0.34]	0.33	[0.85]	0.41	[0.81]
AR	1.10	[0.37]	0.96	[0.44]	0.81	[0.53]	1.57	[0.21]	1.37	[0.27]	1.27	[0.31]
ARCH	0.13	[0.97]	0.81	[0.53]	0.55	[0.70]	0.72	[0.59]	1.62	[0.20]	1.19	[0.34]
hetero	6.89	[0.44]	3.74	[0.81]	12.98	[0.07]	0.28	[0.97]	1.13	[0.39]	1.06	[0.45]
Wald	0.57	[0.45]	**7.73**	[0.01]	**8.60**	[0.00]	**45.63**	[0.00]	**7.89**	[0.01]	**6.99**	[0.01]
Sargan							11.22	[0.80]	29.35	[0.21]	13.26	[0.51]
s.e.e.	0.42		0.39		0.29		0.44		0.35		0.31	
R^2	0.89		0.92		0.88		0.89		0.94		0.87	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-8}^{t=-6} \pi_t$, and $\sum_{t=-8}^{t=-6} y_t$, in (5): $\sum_{t=-8}^{t=-6} \pi_t$, $\sum_{t=-8}^{t=-6} y_t$, $\sum_{t=-8}^{t=-6} i_{s_t}$, and $\sum_{t=-5}^{t=-1} i_{l_t}$, and in (6): $\sum_{t=-8}^{t=-6} y_t$ and $\sum_{t=-8}^{t=-6} i_{l_t}$.

Source: Appendix A.2.1.

Table 10: Bank of England (Q)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
c			4.61	[0.00]	3.39	[0.00]			-7.50	[0.03]	4.36	[0.00]
i_{-1}	1.59	[0.00]			0.91	[0.00]					0.81	[0.00]
i_{-2}	-0.64	[0.00]	-0.39	[0.01]	-0.31	[0.05]	-0.42	[0.01]			-0.28	[0.06]
i_{-3}			-0.51	[0.00]								
i_{-4}	0.44	[0.00]										
i_{-5}			-0.36	[0.02]			0.73	[0.00]				
y_{-1}							-0.73	[0.01]				
y_{-2}	0.38	[0.01]					0.54	[0.01]				
y_{-3}												
y_{-4}	-0.22	[0.30]	-1.20	[0.00]					-0.67	[0.01]		
y_{-5}	0.29	[0.10]										
π_{-1}	-0.33	[0.07]	1.25	[0.00]								
π_{-2}							0.41	[0.01]				
π_{-3}			0.78	[0.00]	-0.09	[0.32]						
π_{-4}	-0.53	[0.00]							1.22	[0.00]		
π_{-5}			1.05	[0.00]								
y							0.80	[0.00]				
y_{+4}									0.66	[0.09]		
π							1.23	[0.00]	2.02	[0.00]		
π_{+4}									0.77	[0.03]		
π_{+8}							-0.18	[0.05]	0.66	[0.04]	-0.21	[0.06]
$d_{06/97:\ \text{polit.}}$	-0.02	[0.91]	**1.37**	[0.00]	**-1.00**	[0.00]	0.16	[0.34]	**1.11**	[0.02]	**-1.34**	[0.00]
$d_{04/99:\ \text{eco.}}$	-0.29	[0.40]	-0.99	[0.16]	0.21	[0.68]	-0.32	[0.37]	-0.49	[0.63]	0.02	[0.97]
$d_{08/99:\ \text{oper.}}$	-0.21	[0.56]	0.11	[0.88]	-0.44	[0.33]	0.00	[0.99]	**1.73**	[0.04]	-0.21	[0.60]
normality	7.30	[0.03]	0.54	[0.76]	2.59	[0.27]	0.38	[0.83]	1.42	[0.49]	3.75	[0.15]
AR	2.52	[0.07]	0.34	[0.85]	1.84	[0.15]	1.36	[0.27]	0.60	[0.67]	1.46	[0.24]
ARCH	0.14	[0.96]	1.85	[0.16]	1.94	[0.13]	0.18	[0.95]	0.70	[0.60]	2.12	[0.11]
hetero	0.65	[0.79]	0.50	[0.90]	2.39	[0.04]	23.87	[0.20]	0.37	[0.97]	2.50	[0.04]
Wald	**8.04**	[0.05]	**17.3**	[0.00]	**17.35**	[0.00]	2.55	[0.47]	**12.5**	[0.01]	**28.24**	[0.00]
Sargan							14.53	[0.75]	13.59	[0.70]	20.30	[0.16]
s.e.e.	0.29		0.61		0.40		0.29		0.73		0.38	
R^2	0.93		0.79		0.94		0.93		0.69		0.95	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-8}^{t=-6} \pi_t$, $\sum_{t=-8}^{t=-6} y_t$, and $\sum_{t=-8}^{t=-1} i_{m_t}$, in

(5): $\sum_{t=-8}^{t=-6} i_{s_t}$ and $\sum_{t=-8}^{t=-1} i_{l_t}$, and in (6): $\sum_{t=-8}^{t=-6} \pi_t$, and $\sum_{t=-8}^{t=-6} y_t$.
Source: Appendix A.2.1.

Table 11: Bank of England (M)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
c	0.44	[0.01]			0.87	[0.04]			-2.76	[0.04]		
i_{-1}	0.99	[0.00]	0.30	[0.00]	0.91	[0.00]	0.92	[0.00]	0.23	[0.02]	0.83	[0.00]
i_{-2}	0.20	[0.06]	0.27	[0.00]					0.32	[0.00]		
i_{-4}	-0.27	[0.00]										
i_{-5}			-0.17	[0.04]			-0.19	[0.00]				
i_{-9}					-0.17	[0.05]						
i_{-10}					0.15	[0.09]					0.11	[0.00]
i_{-12}			0.19	[0.00]					0.22	[0.00]		
i_{-13}							0.11	[0.00]				
y_{-1}							-0.05	[0.04]				
y_{-3}									0.17	[0.03]		
y_{-5}	0.06	[0.00]					0.08	[0.00]				
y_{-6}											0.06	[0.04]
y_{-8}					-0.00	[0.09]						
y_{-9}	-0.05	[0.01]							-0.10	[0.17]		
y_{-12}									0.11	[0.16]		
π_{-1}			0.55	[0.00]								
π_{-4}			0.70	[0.00]					0.71	[0.00]		
π_{-5}			-0.56	[0.00]					-0.72	[0.00]		
π_{-10}							0.16	[0.01]				
π_{-11}							-0.22	[0.01]				
π_{-12}			-0.45	[0.03]			0.17	[0.02]	-0.35	[0.13]		
π_{-13}			0.63	[0.00]					0.58	[0.01]		
π_{-14}	-0.13	[0.03]					-0.22	[0.00]				
π_{-15}	0.13	[0.04]					0.16	[0.01]				
y							0.05	[0.02]	0.09	[0.28]	0.07	[0.01]
π							0.25	[0.00]	0.65	[0.00]		
π_{+12}							0.05	[0.01]	0.26	[0.08]	0.14	[0.00]
π_{+24}									0.30	[0.01]		

Table 11: Bank of England (M) (continued)

	backward looking						forward looking					
	i_p (1)		i_s (2)		i_l (3)		i_p (4)		i_s (5)		i_l (6)	
$d_{06/97}$: polit.	0.04	[0.39]	0.12	[0.43]	**-0.33**	[0.00]	**0.11**	[0.04]	**0.54**	[0.01]	-0.17	[0.26]
$d_{04/99}$: eco.	-0.02	[0.87]	-0.05	[0.87]	0.18	[0.23]	0.00	[0.96]	0.01	[0.98]	**0.26**	[0.01]
$d_{08/99}$: oper.	-0.11	[0.21]	0.04	[0.90]	-0.18	[0.18]	-0.09	[0.30]	-0.00	[1.00]	**-0.14**	[0.00]
normality	2.66	[0.26]	13.35	[0.00]	1.06	[0.59]	0.10	[0.95]	14.41	[0.00]	0.71	[0.70]
AR	1.36	[0.25]	0.84	[0.50]	0.37	[0.83]	0.84	[0.51]	0.80	[0.53]	0.60	[0.66]
ARCH	0.37	[0.83]	7.13	[0.00]	1.51	[0.20]	1.12	[0.35]	1.91	[0.11]	1.05	[0.38]
hetero	22.86	[0.15]	34.38	[0.03]	21.68	[0.03]	31.82	[0.33]	47.81	[0.03]	21.29	[0.07]
Wald	5.28	[0.15]	1.14	[0.77]	**11.23**	[0.01]	5.88	[0.12]	**8.2**	[0.04]	**9.07**	[0.03]
Sargan							83.33	[0.19]	57.04	[0.87]	90.97	[0.19]
s.e.e.	0.16		0.53		0.24		0.14		0.51		0.23	
R^2	0.97		0.77		0.97		0.98		0.80		0.98	

Note: P-values are in brackets. Data period: 1993M1-2002M4. Additional instruments, besides the exogenous variables in the GUM, in (4): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, and $\sum_{t=-24}^{t=-1} i_{l_t}$, in (5): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, and $\sum_{t=-24}^{t=-1} i_{l_t}$, in (6): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, and $\sum_{t=-24}^{t=-1} i_{p_t}$.

Source: Appendix A.2.2.

Table 12: Federal Reserve (Q)

	backward looking						forward looking					
	$i_p(1)$		$i_s(2)$		$i_l(3)$		$i_p(4)$		$i_s(5)$		$i_l(6)$	
c	1.08	[0.12]	1.77	[0.00]	4.47	[0.01]			0.87	[0.00]		
i_{-1}	1.19	[0.00]	0.96	[0.00]	0.62	[0.00]	0.89	[0.00]				
i_{-2}	-0.26	[0.42]										
i_{-3}	-0.12	[0.68]	-0.25	[0.01]							-0.31	[0.03]
i_{-4}	-0.27	[0.36]										
i_{-5}	0.27	[0.20]			-0.39	[0.03]					-0.98	[0.00]
y_{-1}	0.25	[0.12]	0.19	[0.10]								
y_{-2}	0.10	[0.62]									0.58	[0.05]
y_{-3}	-0.27	[0.15]							-0.21	[0.03]	0.60	[0.02]
y_{-4}	0.04	[0.82]					-0.37	[0.00]				
y_{-5}											-1.10	[0.00]
π_{-1}											-1.59	[0.03]
π_{-2}											1.20	[0.01]
π_{-3}	0.26	[0.30]			0.53	[0.02]						
π_{-4}	0.06	[0.86]									2.98	[0.00]
π_{-5}	-0.47	[0.09]	-0.26	[0.06]	-0.44	[0.04]					-0.93	[0.02]
y							0.47	[0.00]	0.38	[0.00]	-0.77	[0.02]
y_{+4}							-0.23	[0.00]			0.73	[0.00]
π											1.61	[0.00]
π_{+4}							0.22	[0.00]	0.19	[0.01]	1.30	[0.00]
$d_{02/94:\ \text{policy}}$	**0.50**	[0.08]	**0.42**	[0.06]	0.29	[0.33]	0.10	[0.57]	0.22	[0.29]	**2.83**	[0.00]
$d_{05/99:\ \text{policy}}$	**-0.53**	[0.06]	**-0.58**	[0.00]	**-0.90**	[0.01]	**-0.33**	[0.02]	**-0.38**	[0.02]	**-1.67**	[0.00]
normality	5.31	[0.07]	2.28	[0.32]	0.23	[0.89]	2.56	[0.28]	1.30	[0.52]	1.52	[0.47]
AR	0.91	[0.48]	1.17	[0.35]	1.14	[0.36]	2.34	[0.08]	0.27	[0.89]	2.03	[0.13]
ARCH	0.35	[0.84]	0.60	[0.67]	1.41	[0.26]	0.31	[0.87]	1.52	[0.22]	0.11	[0.98]
hetero	29.98	[0.27]	13.99	[0.17]	8.26	[0.60]	1.22	[0.33]	0.93	[0.52]	29.89	[0.37]
Wald	**4.79**	[0.09]	**10.37**	[0.01]	**8.58**	[0.01]	**7.09**	[0.03]	**5.91**	[0.05]	**74.82**	[0.00]
Sargan							23.69	[0.26]	21.26	[0.17]	4.65	[0.99]
s.e.e.	0.32		0.34		0.50		0.27		0.30		0.40	
R^2	0.97		0.95		0.76		0.97		0.95		0.88	

Note: P-values are in brackets. Data period: 1993Q1-2002Q4. Additional instruments (besides the exogenous variables in the GUM) in (4): $\sum_{t=-8}^{t=-6}\pi_t$, $\sum_{t=-8}^{t=-6}y_t$, and $\sum_{t=-8}^{t=-1}i_{l_t}$, in (5): $\sum_{t=-8}^{t=-6}i_{s_t}$ and $\sum_{t=-8}^{t=-6}\pi_t$, and in (6):$\sum_{t=-8}^{t=-6}\pi_t$, $\sum_{t=-8}^{t=-6}y_t$, and $\sum_{t=-8}^{t=-1}i_{m_t}$.

Source: Appendix A.2.1.

Table 13: Federal Reserve (M)

	backward looking						forward looking					
	$i_p(1)$		$i_s(2)$		$i_l(3)$		$i_p(4)$		$i_s(5)$		$i_l(6)$	
c	0.48	[0.01]	0.39	[0.03]			-1.69	[0.00]				
i_{-1}	1.05	[0.00]	1.12	[0.00]	0.98	[0.00]	0.72	[0.00]	0.95	[0.00]	0.91	[0.00]
i_{-2}			-0.16	[0.17]								
i_{-3}							0.16	[0.07]				
i_{-4}	-0.22	[0.03]	-0.08	[0.42]					-0.14	[0.08]		
i_{-6}	0.33	[0.00]	0.22	[0.02]			0.17	[0.13]	0.28	[0.00]		
i_{-7}							0.07	[0.56]				
i_{-8}	-0.29	[0.01]	-0.12	[0.32]			-0.13	[0.27]	-0.17	[0.00]		
i_{-9}	0.25	[0.06]	0.13	[0.34]			0.15	[0.19]				
i_{-10}	-0.16	[0.10]	-0.24	[0.04]			-0.29	[0.01]				
i_{-11}							0.16	[0.08]				
i_{-12}			0.20	[0.07]							-0.06	[0.03]
i_{-13}			-0.21	[0.07]								
i_{-15}			0.07	[0.32]								
y_{-1}			0.09	[0.00]								
y_{-2}	0.07	[0.12]										
y_{-3}	0.04	[0.42]							0.06	[0.10]		
y_{-5}	-0.06	[0.12]	-0.07	[0.06]					-0.08	[0.01]		
y_{-6}							-0.08	[0.01]			0.11	[0.03]
y_{-7}			0.06	[0.20]							-0.12	[0.02]
y_{-8}	-0.03	[0.51]	-0.09	[0.04]								
y_{-9}	-0.04	[0.33]					-0.06	[0.16]				
y_{-10}			-0.03	[0.47]								
y_{-11}							-0.07	[0.02]				
y_{-12}	-0.05	[0.21]										
y_{-14}	0.05	[0.24]	0.07	[0.02]								
y_{-15}	0.03	[0.45]										
π_{-1}			0.09	[0.09]								
π_{-2}	0.18	[0.01]					0.14	[0.00]				
π_{-3}	-0.31	[0.01]	-0.13	[0.03]								
π_{-4}	0.11	[0.22]										
π_{-5}											-0.23	[0.03]
π_{-6}			0.07	[0.28]							0.41	[0.00]

Table 13: Federal Reserve (M) (continued)

	backward looking						forward looking					
	$i_p(1)$		$i_s(2)$		$i_l(3)$		$i_p(4)$		$i_s(5)$		$i_l(6)$	
π_{-8}	0.07	[0.27]	0.08	[0.33]			0.12	[0.01]	0.06	[0.04]		
π_{-9}			-0.08	[0.30]								
π_{-12}			0.11	[0.10]								
π_{-13}	0.14	[0.04]										
π_{-15}	-0.27	[0.00]	-0.17	[0.01]								
y							0.13	[0.00]	0.09	[0.00]		
y_{+12}									0.04	[0.04]	0.07	[0.00]
π_{+12}							0.21	[0.00]	0.08	[0.00]	0.09	[0.03]
π_{+24}							0.13	[0.01]	-0.04	[0.02]		
$d_{02/94:\ \text{policy}}$	0.04	[0.67]	0.06	[0.50]	0.10	[0.20]	**0.20**	[0.00]	**0.21**	[0.01]	**0.24**	[0.00]
$d_{05/99:\ \text{policy}}$	**-0.15**	[0.02]	**-0.16**	[0.03]	-0.05	[0.40]	**-0.13**	[0.03]	**-0.20**	[0.00]	**-0.14**	[0.01]
normality	55.32	[0.00]	4.85	[0.09]	0.03	[0.98]	6.52	[0.01]	6.95	[0.03]	1.54	[0.46]
AR	1.14	[0.34]	0.37	[0.83]	2.08	[0.09]	1.10	[0.36]	1.55	[0.19]	2.26	[0.07]
ARCH	0.59	[0.67]	0.99	[0.42]	1.18	[0.33]	0.75	[0.56]	1.03	[0.39]	0.47	[0.76]
hetero	47.83	[0.25]	45.94	[0.56]	6.23	[0.18]	49.39	[0.04]	33.79	[0.09]	16.15	[0.58]
Wald	**6.91**	[0.03]	**6.46**	[0.04]	1.74	[0.42]	**9.33**	[0.01]	**14.73**	[0.00]	**10.11**	[0.01]
Sargan							70.87	[0.16]	77.27	[0.41]	94.13	[0.10]
s.e.e.	0.16		0.15		0.27		0.15		0.15		0.24	
R^2	0.99		0.99		0.91		0.99		0.99		0.93	

Note: P-values are in brackets. Data period: 1993M1-2002M12. Additional instruments, besides the exogenous variables in the GUM, in (4): $\sum_{t=-24}^{t=-16} i_{p_t}$ and $\sum_{t=-24}^{t=-1} i_{m_t}$, in (5): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, $\sum_{t=-24}^{t=-16} i_{s_t}$, and $\sum_{t=-15}^{t=-1} i_{l_t}$ and in (6): $\sum_{t=-24}^{t=-16} \pi_t$, $\sum_{t=-24}^{t=-16} y_t$, $\sum_{t=-15}^{t=-1} i_{m_t}$, $\sum_{t=-24}^{t=-16} i_{l_t}$.

Source: Appendix A.2.2.

Tabel 14: Summary of backward looking results

	i_p		i_s		i_l		Flexibility	Reputation
RBA								
$d_{10/01}$: economic	**-0.94**	[0.01]	**-0.43**	[0.06]	0.46	[0.25]	+	0
ECB								
$d_{12/00}$: economic	-0.21	[0.44]	-0.40	[0.15]	**-0.31**	[0.07]	0	+
$d_{11/01}$: policy	**-0.45**	[0.08]	-0.16	[0.58]	-0.03	[0.88]	+	0
EMU	**0.49**	[0.00]	**0.36**	[0.01]	**0.48**	[0.00]	-	-
BoJ								
$d_{01/98}$: political/proc.	-0.14	[0.50]	0.02	[0.85]	-0.05	[0.79]	0	0
$d_{10/00}$: economic	0.35	[0.19]	-0.03	[0.74]	0.07	[0.80]	0	0
$d_{03/01}$: operational	0.00	[0.98]	-0.01	[0.90]	0.18	[0.53]	0	0
RBNZ								
$d_{03/99}$: policy/oper.	-0.63	[0.18]	-0.63	[0.18]	0.13	[0.63]	0	0
$d_{12/00}$: policy	-0.13	[0.76]	-0.13	[0.76]	**-0.69**	[0.04]	0	+
SRB								
$d_{03/97}$: economic	**0.60**	[0.01]	**0.57**	[0.01]	0.30	[0.19]	-	0
$d_{01/99}$: political	**-0.39**	[0.08]	**-0.38**	[0.06]	**0.82**	[0.02]	+	-
$d_{10/99}$: econ/policy	0.11	[0.77]	0.09	[0.80]	-0.91	[0.13]	0	0
$d_{03/00}$: operational	-0.13	[0.74]	-0.13	[0.72]	0.04	[0.95]	0	0
$d_{03/02}$: proc/policy	-0.15	[0.52]	-0.07	[0.74]	**-0.60**	[0.09]	0	+
SNB								
$d_{12/99}$: polit./econ./oper.	0.13	[0.46]	**0.38**	[0.01]	**-0.39**	[0.01]	-	+
BoE								
$d_{06/97}$: political	-0.02	[0.91]	**1.37**	[0.00]	**-1.00**	[0.00]	-	+
$d_{04/99}$: economic	-0.29	[0.40]	-0.99	[0.16]	0.21	[0.68]	0	0
$d_{08/99}$: operational	-0.21	[0.56]	0.11	[0.88]	-0.44	[0.33]	0	0
Fed								
$d_{02/94}$: policy	**0.50**	[0.08]	**0.42**	[0.06]	0.29	[0.33]	-	0
$d_{05/99}$: policy	**-0.53**	[0.06]	**-0.58**	[0.00]	**-0.90**	[0.01]	+	+

Note: Coefficient estimates for transparency indicators $d_{MM/YY}$ reported in Tables 1, 2, 4, 6, 7, 9, 10 and 12, with p-values in brackets. The additional EMU indicator for the ECB turns on in January 1999. The last two columns indicate whether the increase in transparency appears to improve (+), reduce (–) or has no effect (0) on flexibility and reputation.

Table 15: Summary of forward looking results

	i_p		i_s		i_l		Flexibility	Reputation
RBA								
$d_{10/01}$: economic	**-0.83**	[0.00]	**-0.54**	[0.00]	-0.25	[0.38]	+	0
ECB								
$d_{12/00}$: economic	-0.02	[0.94]	-0.60	[0.14]	-0.51	[0.64]	0	0
$d_{11/01}$: policy	**-0.57**	[0.05]	**-1.85**	[0.00]	**-2.81**	[0.00]	+	+
EMU	-0.04	[0.89]	-0.64	[0.14]	0.28	[0.83]	0	0
BoJ								
$d_{01/98}$: political/proc.	-0.06	[0.78]	**-0.19**	[0.04]	-0.24	[0.23]	+	0
$d_{10/00}$: economic	0.32	[0.21]	-0.26	[0.14]	0.20	[0.47]	0	0
$d_{03/01}$: operational	**-0.31**	[0.09]	-0.17	[0.35]	0.11	[0.69]	+	0
RBNZ								
$d_{03/99}$: policy/oper.	-0.05	[0.92]	-0.05	[0.92]	0.33	[0.24]	0	0
$d_{12/00}$: policy	**-2.10**	[0.00]	**-2.11**	[0.00]	-0.40	[0.16]	+	0
SRB								
$d_{03/97}$: economic	**0.74**	[0.00]	**0.57**	[0.00]	**0.19**	[0.40]	-	-
$d_{01/99}$: political	**-0.75**	[0.00]	**-1.11**	[0.00]	**1.07**	[0.01]	+	-
$d_{10/99}$: econ/policy	-0.20	[0.57]	-0.02	[0.94]	0.09	[0.88]	0	0
$d_{03/00}$: operational	-0.33	[0.30]	0.13	[0.64]	-0.04	[0.95]	0	0
$d_{03/02}$: proc/policy	0.27	[0.16]	**0.48**	[0.01]	**-1.14**	[0.00]	-	+
SNB								
$d_{12/99}$: polit./econ./oper.	**-1.68**	[0.00]	**0.38**	[0.01]	**-0.50**	[0.01]	+/-	+
BoE								
$d_{06/97}$: political	0.16	[0.34]	**1.11**	[0.02]	**-1.34**	[0.00]	-	+
$d_{04/99}$: economic	-0.32	[0.37]	-0.49	[0.63]	0.02	[0.97]	0	0
$d_{08/99}$: operational	0.00	[0.99]	**1.73**	[0.04]	-0.21	[0.60]	-	0
Fed								
$d_{02/94}$: policy	0.10	[0.57]	0.22	[0.29]	**2.83**	[0.00]	0	-
$d_{05/99}$: policy	**-0.33**	[0.02]	**-0.38**	[0.02]	**-1.67**	[0.00]	+	+

Note: Coefficient estimates for transparency indicators $d_{MM/YY}$ reported in Tables 1, 2, 4, 6, 7, 9, 10 and 12, with p-values in brackets. The additional EMU indicator for the ECB turns on January 1999. The last two columns indicate whether the increase in transparency appears to improve (+), reduce (–) or has no effect (0) on flexibility and reputation.

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A Appendix

This appendix provides details about the variables used in the empirical analysis, namely the transparency indicators $d_{MM/YY}$ and the macroeconomic data used for the interest rates i_p, i_s and i_l, inflation π, and the output gap y. In addition we present the regressions results to test robustness.

A.1 Transparency Indicators

This section contains a detailed description of the transparency indicators $d_{MM/YY}$ that represent changes in transparency according to the Eijffinger and Geraats (2004) index for each central bank from 1998 to 2002. In square brackets is (in reverse order) the date of change, the change in the index score, and the aspect it pertains to: (1) political, (2) economic, (3) procedural, (4) policy, and (5) operational.

In addition, a few events outside the 1998-2002 sample of Eijffinger and Geraats (2004) have been included (BoJ $d_{01/98}$, SRB $d_{03/97}$, ...) as they would clearly effect transparency scores.

Finally, several transparency indicators (ECB $d_{12/00}$; RBNZ $d_{03/99}$; SRB $d_{10/99}$ and $d_{03/02}$; SNB $d_{12/99}$) capture multiple changes in the transparency scores to avoid exact multicollinearity.

Reserve Bank of Australia (RBA)

· $d_{10/01}$: [(2) **+1**, 10/2001] The speech "The Monetary Policy Process at the RBA" by Glenn Stevens, Assistant Governor, Melbourne, October 10, 2001 (available from http://www.rba.gov.au) clarifies that the Reserve Bank uses the following macroeconomic model for policy analysis: 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.

European Central Bank (ECB)

· $d_{12/00}$: [(2) **+0.5**, 12/2000] Since December 2000, conditional inflation and output projections for the medium term have been published twice a year in the June and December *Monthly Bulletin*.
[(2) **+1**, 1/2001] Publication of a structural macroeconomic model used by the ECB for policy analysis: G. Fagan, J. Henry and R. Metez, "An Area-Wide Model (AWM) for the Euro Area", *European Central Bank Working Paper* 42, January 2001.

· $d_{11/01}$: [(4) **+0.5**, 11/2001] Since November 2001, monetary policy meetings of the Governing Council have taken place once a month, followed by a press conference in which the President provides an introductory statement with an explanation of the

policy decision. Before that, there were two policy meetings every month, only the first of which was followed by such a press conference.

Bank of Japan (BoJ)

· $d_{01/98}$: [(1) and (3) **+?**, 01/1998] An amendment of the Bank of Japan Law specifies that monetary policy "shall be aimed at, through the pursuit of price stability, contributing to the sound development of the national economy" (Art. 2), it affirms the autonomy of the Bank of Japan over monetary policy (Art. 3.1) and increases its effective independence. In addition, the Bank is required to be transparent about "the content of its decisions, as well as its decision making process" (Art. 3.2), and in particular, publish the minutes and transcripts of the monetary policy meetings of the Policy Board (Art. 20) and submit a semi-annual report on monetary policy to the Diet (Art. 54.1). The amendment entered into force April 1, 1998, but the regular monetary policy meetings by the Policy Board and the publication of minutes started in January 1998.

· $d_{10/00}$: [(2) **+0.5**, 10/2000] Starting in October 2000, the semiannual *Outlook and Risk Assessment of the Economy and Prices* contains short-term conditional forecasts for inflation and output by the Policy Board.

· $d_{03/01}$: [(5) **-0.5**, 3/2001] On March 19, 2001 the main operating target was changed from the average uncollateralized overnight call rate (which has been effectively zero since February 12, 1999) to the outstanding balance of the current accounts at the Bank. In contrast to the previous target, it is a very rough range and the targeted variable shows significant fluctuations within it, but there are no explanations for these control errors. Note that $d_{03/01}$ is the only indicator that solely pertains to a reduction in transparency. To facilitate the interpretation of the results, $d_{03/01}$ changes from 1 to 0 on 03/01, so that $d_{03/01}$ still captures the effect of transparency.

Reserve Bank of New Zealand (RBNZ)

· $d_{03/99}$: [(4) **+1.5**, 3/1999] Initially, there were no explanations of formal policy decisions, but after the introduction of the Official Cash Rate in March 1999, explanations were provided in case of policy changes (see http://www.rbnz.govt.nz). In addition, since March 1999 the quarterly *Monetary Policy Statement* has included three-year ahead unconditional projections for the 90-day bank bill rate, which is very closely related to the Official Cash Rate and therefore serves as a policy inclination.
[(5) **+1**, 3/1999] Initially, when the daily settlement cash target was the formal operating target, there was no evaluation of its achievement, causing opacity about control errors. In March 1999, the main operating target was changed to the Official Cash Rate, which is nearly perfectly controlled (e.g. see Andy Brookes and Tim Hampton, 'The Official Cash Rate one year on', *Reserve Bank Bulletin*, June 2000).

· $d_{12/00}$: [(4) **+0.5**, 12/2000] Since December 2000, explanations for policy decisions

have also been provided when it was decided not to adjust the Official Cash Rate (see http://www.rbnz.govt.nz).

Note that one event has not been included due to considerable uncertainty about the precise timing, namely: [(2) **+0.5**, 2002?] Data on capacity utilization have become publicly available in Excel spreadsheets that accompany the quarterly *Monetary Policy Statements* on the web site (http://www.rbnz.govt.nz), at least since June 2002.

Swedish Riksbank (SRB)

· $d_{03/97}$: [(2) **+1**, 03/1997] Publication of inflation forecasts in the quarterly Inflation Report since March 1997.

· $d_{01/99}$: [(1) **+1**, 1/1999] Amendments (effective from January 1999) to the *Constitution Act* and the *Sveriges Riksbank Act* clarify the Riksbank's institutional independence and main objective. In particular, "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; "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; and, "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.

· $d_{10/99}$: [(4) **+0.5**, 10/1999] Starting in October 1999, the announcement of every policy decision is accompanied by an explanation, whereas previously this was only the case for adjustments in the policy instrument.
[(2) **+0.5**, 12/1999] Since December 1999, data on many economic variables, including capacity utilization (in the form of econometric estimates of the output gap), have become available for downloading from the Riksbank web site (http://www.riksbank.com) in Excel spreadsheets accompanying the quarterly *Inflation Report*.

· $d_{03/00}$: [(5) **+1**, 3/2000] Beginning in 2000, the March *Inflation Report* includes a discussion of past inflation forecast errors, revealing macroeconomic transmission disturbances, and an evaluation of the inflation outcome over the last three years, including an account of the contribution of monetary policy.

· $d_{03/02}$: [(4) **+1**, 3/2002] A policy inclination indicating the likely adjustment of interest rate in the near future was first provided at the announcement of the policy decision in March 2002.
[(3) **+1**, 5/2002] Initially, the minutes sometimes noted attributed reservations against the policy decision, but it was not clear whether these were (the only) dissents. This was clarified in May 2002, so that the minutes now effectively provide attributed voting records.

Swiss National Bank (SNB)

· $d_{12/99}$: [(1) **+1**, 12/1999] A quantitative definition of price stability was specified in December 1999, namely an inflation rate as measured by the national consumer price index of less than 2 % per annum.
[(2) **+0.5**, 12/1999] Since December 1999, an inflation forecast for the three ensuing years has been presented in the June and December *Quarterly Bulletin* (in French and German only) and at the half-yearly media news conference (in English).
[(5) **-0.5**, 12/1999] Initially, a graphical evaluation of monetary targets was included in the *Annual Report* with an explanation of deviations. From December 1999 on, the operational target range of 100 basis points for the three-month LIBOR rate has been graphically evaluated in *Annual Report*, but without explanations for control errors in the form of significant fluctuations within this range.
[(1) **+0.5**, 1/2000] A constitutional amendment, effective from January 2000, enshrines the Bank's independence: "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).

Bank of England (BoE)

· $d_{06/97}$: [(1) **+?**, 1997] The Bank of England (BoE) was granted operational independence in 1997 and the first interest rate decision by the independent Monetary Policy Committee (MPC) was made in June 1997.

· $d_{04/99}$: [(2) **+1**, 4/1999] Extensive documentation on the Bank's policy models is provided in *Economic Models at the Bank of England*, April 1999 (see also the September 2000 Update), and the computer code of the macroeconometric model is available from http://www.bankofengland.co.uk.

· $d_{08/99}$ [(5) **+0.5**, 8/1999)] Since 1999, there has been a discussion of the Monetary Policy Committee's forecasting record for inflation and output in the August *Inflation Report*.

Note that one event has not been included due to considerable uncertainty about the precise timing, namely: [(2) **+0.5**, 2002?] Time series for relevant macroeconomic variables, including the output gap have become available from the Bank of England web site.

Federal Reserve (Fed)

· $d_{02/94}$: [(4) **+1**, 1994] The Federal Reserve (Fed) first provided a prompt announcement of its Federal Funds rate decision in February 1994.

· $d_{05/99}$: [(4) **+1.5**, 5/1999] Since May 1999, an explanation of every policy decision has been provided at the time of announcement, instead of only in case of an adjustment of the policy instrument. Furthermore, an explicit phrase that describes the policy tilt has been included in the statement released after every policy meet-

ing, which is further explained in the Federal Reserve Board Press Release "FOMC announced modifications of its disclosure procedures", January 19, 2000 (all available from http://www.federalreserve.gov).

A.2 Macroeconomic Variables

This section specifies which macroeconomic data were used in the regressions for each central bank. It contains details about the policy rate i_p, short rate i_s, long rate i_l, medium rate i_m, inflation π, and the output gap y.

A.2.1 Quarterly data

Policy Rate (end of quarter values)
RBA: Cash rate target, end of the month (www.rba.gov.au)
ECB: Eonia, end of the month, 1994-1998; monthly averages, 1999-2002 (www.ecb.int)
BoJ: Uncollateralized overnight call rates, end of month (www.boj.or.jp)
RBNZ: Overnight inter-bank cash average, end of the month (www.rbnz.govt.nz)
SRB: Repo rate since June 1994, end of the month; marginal rate before June 1994, end of the month (www.riksbank.com)
SNB: Three month libor rate, end of the month (www.snb.ch)
BoE: Repo rate, end of the month (www.bankofengland.co.uk)
Fed: Federal funds rate, end of the month
(www.ny.frb.org/markets/statistics/dlyrates/fedrate.html)

Short Nominal Interest Rate (last month of the quarter average)
RBA: Average rate on money market (IMF, International Financial Statistics)
ECB: Three-months money market (Datastream)
BoJ: Call money rate (MF, International Financial Statistics)
RBNZ: Money market rate (IMF, International Financial Statistics)
SRB: Call money rate (IMF, International Financial Statistics)
SNB: Money market rate (IMF, International Financial Statistics)
BoE: Overnight Interbank (MF, International Financial Statistics)
Fed: Treasury bill rate (MF, International Financial Statistics)

Long Nominal Interest Rate (end of quarter values)
RBA: Treasury bonds: 10 years, last month of the quarter (www.rba.gov.au)
ECB: Government bonds: 10 years, monthly first day (www.ecb.int)

BoJ: 1992Q1-1998Q3, simple yields on TSE bonds: 10 years, selected with longest remaining maturity, end of the month value; for 1998Q4-2003Q4, newly issued government bonds (10 years), end of the month value (www.boj.or.jp)
RBNZ: Sec. market government bond yields: 10 years, last day of the month (www.rbnz.govt.nz)
SRB: 10 year government bond yield, monthly average (www.riksbank.se)
SNB: CHF Obligationen der Eidgenossenschaft, last day of the month (www.snb.che)
BoE: Nominal 10-year yield on Britisch government securities, end of the month (www.bankofengland.co.uk)
Fed: 10 year yields on treasury securities, last day of the month (www.ny.frb.org/markets/statistics/dlyrates/fedrate.html)

Medium Nominal Interest Rate (utilised as an instrument)
RBA: Treasury bonds: 3 years, last month of the quarter (IMF, International Financial Statistics)
RBNZ: Secondary market government bond yields: 2 years, last day of the month (www.rbnz.govt.nz)
BoE: Short term government bond yields, last month of the quarter (IMF, International Financial Statistics)
Fed: Government bond yields: 3 years, last month of the quarter (IMF, International Financial Statistics)

Inflation (annual inflation based on quarterly data)
Inflation is computed using the Consumer Price Index (IMF, International Financial Statistics), except for the ECB for which the HICP is used (Eurostat). To be precise: $\pi_t = (CPI_t/CPI_{t-4} - 1) \times 100$, using quarterly data.

Output Gap (based on quarterly GDP data)
The output gap is computed using quarterly data for Gross Domestic Product (OECD). To be precise: $y = (GDP/HPtrend - 1) \times 100$, where $HPtrend$ is the trend based on the Hodrick-Prescott filter, calculated with GDP data for the period 1960-2004 (applying E-views).

A.2.2 Monthly data

The interest rate data is the same as the data used in the quarterly regressions. Instead the output gap data differs, the GDP data is replaced by monthly production data for the central banks for which this information is available (ECB, BoJ, SRB, BoE and Fed).

Inflation (annual inflation based on monthly data)
Inflation is computed using the Consumer Price Index (IMF, International Financial Statistics), except for the ECB for which the HICP is used (Eurostat). To be precise: $\pi_t = (CPI_t/CPI_{t-12} - 1) \times 100$.

Output Gap (based on monthly production data)

The output gap is computed using monthly (seasonally adjusted) production data (IMF, International Financial Statistics), except for the ECB for which Eurostat data is used. To be precise: $y = (production/HPtrend - 1) \times 100$, where $HPtrend$ is the trend based on the Hodrick-Prescott filter, calculated with production data for the period 1960-2004 (using E-views), except for the ECB for which production data was only available from 1985-2004.

A.3 Robustness

To test whether the results are robust for different model settings within PcGets, the regressions were estimated with quarterly data in two extra ways. First, the same selection settings are applied but the transparency dummies are not forced (NF) to show up in the ultimately selected model. An overview of the resulting dummies is presented in Table 16 (containing the backward looking estimation results) and in Table 17 (containing the forward looking estimation results). Second, the regressions are rerun with a more conservative strategy that minimizes non-deletion. The results are shown in Table 18 (backward looking) and in Table 19 (forward looking). When possible, the forward looking regressions were performed with the same instruments to maintain similarity with the baseline scenario. This was not always possible. When the p-value of a diagnostic test was lower than 0.025, when a run time error occurred, or when the p-value of the Sargan test was lower than 0.10, instruments that work better were, if possible, applied.

The results presented in Table 16, confirm earlier findings presented in Table 14 for the RBA, the BoJ, the RBNZ, the SRB, the SNB and the Fed. For the ECB some findings differ. The beneficial reputation effect of the economic transparency increase disappears. The same holds for the beneficial flexibility effect of increased policy transparency, but now the effect of this transparency change on the reputation of the ECB is significant and beneficial. For the BoE not forcing all dummies to be in the selected specification leads to the finding of two extra beneficial effects of increased transparency. The results suggest that both the economic and operational transparency increases went along with increased flexibility.

When we compare the forward looking results in Table 17 with the baseline scenario forward looking results presented in Table 15, differences for almost all countries are found. But as before, there are no contradicting results, in the sense that a dummy

coefficient is negatively significant in one case but positively significant when the selection method is changed.

When the backward looking conservative regression results presented in Table 18 are compared with the baseline scenario results shown in Table 14, it is found that there is only one instance in which the sign of a transparency dummy coefficient changed. This is the case for the Bank of England coefficient of $d_{06/97}$, but this is not a surprising finding because the coefficient is close to zero based on both settings. So these results support our previous findings.

Much more sign changes occur when we compare the forward looking results in Table 19, with the ones presented in Table 15. One explanation for this finding is the use of different instruments than in the baseline case. Only one result contradicts, as defined before, with previous findings. The results suggest that the coefficient of the operational transparency change of the BoJ, indicated by $d_{03/01}$, went along with significantly higher policy rates instead of significantly lower policy rates.

Overall, we can conclude that most results are robust to changes in the selection strategy.

Table 16: Summary of backward looking results (NF)

	i_p		i_s		i_l		Flexibility	Reputation
RBA								
$d_{10/01}$: economic	**-0.94**	[0.01]	**-0.43**	[0.06]	-	-	+	0
ECB								
$d_{12/00}$: economic	-	-	-	-	-	-	0	0
$d_{11/01}$: policy	-	-	-	-	**-0.26**	[0.08]	0	+
EMU	**0.35**	[0.00]	**0.31**	[0.00]	**0.52**	[0.00]	-	-
BoJ								
$d_{01/98}$: political/proc.	-	-	-	-	-	-	0	0
$d_{10/00}$: economic	-	-	-	-	-	-	0	0
$d_{03/01}$: operational	-	-	-	-	-	-	0	0
RBNZ								
$d_{03/99}$: policy/oper.	-	-	-	-	-	-	0	0
$d_{12/00}$: policy	-	-	-	-	**-0.58**	[0.02]	0	+
SRB								
$d_{03/97}$: economic	**0.54**	[0.00]	**0.53**	[0.00]	-	-	-	0
$d_{01/99}$: political	**-0.38**	[0.04]	**-0.38**	[0.02]	**0.58**	[0.00]	+	-
$d_{10/99}$: econ/policy	-	-	-	-	-	-	0	0
$d_{03/00}$: operational	-	-	-	-	-	-	0	0
$d_{03/02}$: proc/policy	-	-	-	-	**-0.64**	[0.05]	0	+
SNB								
$d_{12/99}$: polit./econ./oper.	-	-	**0.38**	[0.01]	**-0.39**	[0.01]	-	+
BoE								
$d_{06/97}$: political	-	-	**1.37**	[0.00]	**-1.15**	[0.00]	-	+
$d_{04/99}$: economic	-	-	**-0.90**	[0.03]	-	-	+	0
$d_{08/99}$: operational	**-0.49**	[0.01]	-	-	-	-	+	0
Fed								
$d_{02/94}$: policy	**0.50**	[0.08]	**0.42**	[0.06]	-	-	-	0
$d_{05/99}$: policy	**-0.53**	[0.06]	**-0.58**	[0.00]	**-0.84**	[0.01]	+	+

Note: Coefficient estimates for transparency indicators $d_{MM/YY}$ with p-values in brackets. The additional EMU indicator for the ECB turns on January 1999. The last two columns indicate whether the increase in transparency appears to improve (+), reduce (–) or has no effect (0) on flexibility and reputation.

Table 17: Summary of forward looking results (NF)

	i_p		i_s		i_l		Flexibility	Reputation
RBA								
$d_{10/01}$: economic	**-0.95**	[0.01]	**-0.54**	[0.00]	-	-	+	0
ECB								
$d_{12/00}$: economic	-	-	-	-	-	-	0	0
$d_{11/01}$: policy	-	-	-	-	-	-	0	0
EMU	-	-	-	-	-	-	0	0
BoJ								
$d_{01/98}$: political/proc.	**-0.46**	[0.04]	-	-	**-0.34**	[0.05]	+	+
$d_{10/00}$: economic	-	-	-	-	-	-	0	0
$d_{03/01}$: operational	0.35	[0.13]	-	-	-	-	0	0
RBNZ								
$d_{03/99}$: policy/oper.	-	-	-	-	-	-	0	0
$d_{12/00}$: policy	**-**	-	**-**	-	**0.54**	[0.03]	0	-
SRB								
$d_{03/97}$: economic	**0.47**	[0.00]	**0.57**	[0.00]	-	-	-	0
$d_{01/99}$: political	-	-	**-1.03**	[0.00]	-	-	+	0
$d_{10/99}$: econ/policy	-	-	-	-	-	-	0	0
$d_{03/00}$: operational	-	-	-	-	-	-	0	0
$d_{03/02}$: proc/policy	-	-	**0.48**	[0.01]	-	-	-	0
SNB								
$d_{12/99}$: polit./econ./oper.	**-1.23**	[0.00]	-	-	-	-	+	0
BoE								
$d_{06/97}$: political	-	-	**0.61**	[0.01]	**-2.18**	[0.00]	-	+
$d_{04/99}$: economic	-	-	-	-	-	-	0	0
$d_{08/99}$: operational	-	-	-	-	-	-	0	0
Fed								
$d_{02/94}$: policy	-	-	-	-	**1.78**	[0.00]	0	-
$d_{05/99}$: policy	-	-	-	-	**-1.30**	[0.00]	0	+

Note: Coefficient estimates for transparency indicators $d_{MM/YY}$ with p-values in brackets. The additional EMU indicator for the ECB turns on January 1999. The last two columns indicate whether the increase in transparency appears to improve (+), reduce (–) or has no effect (0) on flexibility and reputation.

Table 18: Summary of backward looking results (conservative)

	i_p		i_s		i_l		Flexibility	Reputation
RBA								
$d_{10/01}$: economic	**-0.94**	[0.01]	-0.14	[0.43]	0.03	[0.93]	+	0
ECB								
$d_{12/00}$: economic	-0.11	[0.70]	**-0.61**	[0.01]	**-0.31**	[0.07]	+	+
$d_{11/01}$: policy	-0.12	[0.59]	-0.33	[0.21]	-0.03	[0.88]	0	0
EMU	**0.38**	[0.00]	**0.48**	[0.00]	**0.48**	[0.00]	-	-
BoJ								
$d_{01/98}$: political/proc.	-0.04	[0.84]	0.02	[0.85]	-0.07	[0.74]	0	0
$d_{10/00}$: economic	0.03	[0.89]	-0.03	[0.74]	0.10	[0.73]	0	0
$d_{03/01}$: operational	0.02	[0.92]	-0.01	[0.90]	0.27	[0.38]	0	0
RBNZ								
$d_{03/99}$: policy/oper.	-0.63	[0.18]	-0.63	[0.18]	0.31	[0.22]	0	0
$d_{12/00}$: policy	-0.13	[0.76]	-0.13	[0.76]	-0.25	[0.41]	0	0
SRB								
$d_{03/97}$: economic	**0.75**	[0.00]	**0.41**	[0.01]	0.30	[0.19]	-	0
$d_{01/99}$: political	-0.31	[0.18]	-0.25	[0.26]	**0.82**	[0.02]	0	-
$d_{10/99}$: econ/policy	0.18	[0.65]	0.17	[0.65]	-0.91	[0.13]	0	0
$d_{03/00}$: operational	-0.49	[0.22]	-0.20	[0.57]	0.04	[0.95]	0	0
$d_{03/02}$: proc/policy	-0.33	[0.18]	-0.04	[0.84]	**-0.60**	[0.09]	0	+
SNB								
$d_{12/99}$: polit./econ./oper.	0.06	[0.65]	**0.35**	[0.02]	**-0.39**	[0.01]	-	+
BoE								
$d_{06/97}$: political	0.00	[1.00]	**1.37**	[0.00]	**-1.07**	[0.00]	-	+
$d_{04/99}$: economic	-0.25	[0.48]	-0.99	[0.16]	0.52	[0.28]	0	0
$d_{08/99}$: operational	-0.31	[0.38]	0.11	[0.88]	-0.52	[0.25]	0	0
Fed								
$d_{02/94}$: policy	**0.50**	[0.08]	**0.42**	[0.06]	0.33	[0.25]	-	0
$d_{05/99}$: policy	**-0.53**	[0.06]	**-0.58**	[0.00]	-0.12	[0.52]	+	0

Note: Coefficient estimates for transparency indicators $d_{MM/YY}$ with p-values in brackets. The additional EMU indicator for the ECB turns on January 1999. The last two columns indicate whether the increase in transparency appears to improve (+), reduce (–) or has no effect (0) on flexibility and reputation.

Table 19: Summary of forward looking results (conservative)

	i_p		i_s		i_l		Flexibility	Reputation
RBA								
$d_{10/01}$: economic	**-0.83**	[0.00]	**-0.40**	[0.02]	0.03	[0.93]	+	0
ECB								
$d_{12/00}$: economic	0.41	[0.33]	-0.60	[0.14]	-1.61	[0.18]	0	0
$d_{11/01}$: policy	**-2.03**	[0.00]	**-1.85**	[0.00]	**-1.79**	[0.06]	+	+
EMU	-0.59	[0.30]	-0.64	[0.14]	-0.50	[0.75]	0	0
BoJ								
$d_{01/98}$: political/proc.	-0.22	[0.36]	-0.05	[0.67]	-0.24	[0.23]	0	0
$d_{10/00}$: economic	-0.30	[0.40]	0.12	[0.37]	0.20	[0.47]	0	0
$d_{03/01}$: operational	**0.35**	[0.08]	-0.01	[0.87]	0.11	[0.69]	-	0
RBNZ								
$d_{03/99}$: policy/oper.	-0.05	[0.92]	-0.05	[0.92]	0.31	[0.22]	0	0
$d_{12/00}$: policy	**-2.10**	[0.00]	**-2.11**	[0.00]	-0.25	[0.41]	+	0
SRB								
$d_{03/97}$: economic	**0.61**	[0.00]	**0.55**	[0.00]	-0.37	[0.42]	-	0
$d_{01/99}$: political	0.44	[0.12]	**-1.05**	[0.00]	0.62	[0.25]	+	0
$d_{10/99}$: econ/policy	-0.03	[0.94]	-0.01	[0.97]	-0.32	[0.65]	0	0
$d_{03/00}$: operational	-0.52	[0.18]	0.10	[0.74]	0.02	[0.98]	0	0
$d_{03/02}$: proc/policy	**-0.45**	[0.09]	**0.46**	[0.01]	**-0.76**	[0.09]	+/-	+
SNB								
$d_{12/99}$: polit./econ./oper.	**-1.68**	[0.00]	**0.35**	[0.01]	0.01	[0.95]	+/-	0
BoE								
$d_{06/97}$: political	**0.29**	[0.06]	0.51	[0.10]	**-1.34**	[0.00]	-	+
$d_{04/99}$: economic	-0.32	[0.39]	-0.56	[0.45]	0.02	[0.97]	0	0
$d_{08/99}$: operational	-0.24	[0.48]	0.51	[0.47]	-0.21	[0.60]	0	0
Fed								
$d_{02/94}$: policy	0.10	[0.57]	0.08	[0.74]	**1.69**	[0.00]	0	-
$d_{05/99}$: policy	**-0.33**	[0.02]	-0.17	[0.27]	-0.40	[0.14]	+	0

Note: Coefficient estimates for transparency indicators $d_{MM/YY}$ with p-values in brackets. The additional EMU indicator for the ECB turns on January 1999. The last two columns indicate whether the increase in transparency appears to improve (+), reduce (–) or has no effect (0) on flexibility and reputation.