

# The Evolution of Central Bank Governance around the World

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**T**he world's oldest existing central bank, Sweden's Riksbank, opened its doors in 1668. The Bank of England began operating in 1694. For centuries, central banks have been evolving in their assigned tasks, their relationship to the state, their interaction with financial market participants, and their internal management and decision-making processes. Walter Bagehot ([1873] 1915, p. 229) famously commented in his book *Lombard Street* on the need to adapt a central bank's governance structure to its changing purpose, writing that "putting new wine into old bottles' is safe only when you watch the condition of the bottle, and adapt its structure most carefully."

But although evolution of central banking is nothing new, the past two decades have seen enormous changes in central banks and their practices, especially in reforms of how those banks are governed. These reforms have differed across countries. In some—the United Kingdom, for example—older institutions have been fundamentally restructured. In other countries, entirely new central banks have been established. For instance, since the fall of the Berlin Wall in 1989, 15 central banks have been created in countries that were formerly part of the Soviet Union. In Europe, the member countries of the European Union created a supranational central bank that oversees a monetary union. In all of these situations, central bank law was either revised or written *de novo*, while institutional objectives, practices, and structures were amended or created from scratch.

In this article, we survey and quantify the trends in two major areas of central bank governance: independence and transparency. We document the steady progress toward greater central bank independence and transparency in a large

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number of industrial and developing countries over the past 10 to 15 years and discuss the effects of these aspects of governance on inflation. We also touch on another aspect of governance that has received attention more recently in key industrial countries: committee structure and decision making.

## **Central Bank Independence**

The initial impetus for changes in central bank governance over the past two decades was the widespread inflation in the 1970s. Seminal research pointed to a time inconsistency problem: a central bank with a high degree of discretion in conducting monetary policy would find itself under constant political pressure to boost the economy and reduce unemployment, but since the economy cannot exceed its potential GDP or its natural rate of unemployment over time, this policy would instead only lead to higher inflation in the long run (Kydland and Prescott, 1977; Barro and Gordon, 1983). One solution to this problem was to delegate monetary policy to individuals who are highly averse to inflation and insulate them from the rest of government (Rogoff, 1985). Another solution was to give stronger incentives to a central bank's management for controlling inflation (Walsh, 1995). In either case, greater independence for the central bank could help to provide the policies necessary to achieve lower inflation.

### **Measuring Central Bank Independence**

Measurement of central bank independence has generally focused on a set of legal characteristics that can be obtained from an institution's statutes. Broadly speaking, these legal characteristics relate to four aspects of a central bank's independence from government. First, independence is greater when the central bank's management is insulated from political pressure by secure tenure and independent appointment. Second, the central bank enjoys greater freedom when the government cannot participate in or overturn its policy decisions. Third, independence is greater when the central bank's legal mandate specifies a clearly defined objective for monetary policy. Finally, financial independence of the central bank relies upon restrictions that limit lending to the government.

To evaluate how central bank independence has changed since the 1980s, we use as our baseline a study of central bank independence in 72 countries conducted by Cukierman, Webb, and Neyapti (1992). Using central bank laws from 1980–89, these authors coded different legal characteristics related to the four aspects of central bank independence we discussed above. Each legal characteristic was scored according to the authors' numerical coding on a range of zero (least independent) to one (most independent); characteristics were then weighted to obtain an overall independence measure.

Four legal characteristics, which pertained to the procedures for appointment or dismissal of the central bank governor, accounted for 20 percent of the overall index. For example, a central bank received the highest independence score if,

according to its statute, the governor had a term in office of more than eight years, was appointed by the central bank's board (as opposed to the legislative or executive branch of government), could not be dismissed for any reason, and was restricted from holding other positions in the government while heading the central bank. Three legal characteristics, used to judge the independence of the central bank's policy formulation process, accounted for 15 percent of the overall index. For this aspect of independence, the highest ranking was given to a central bank that formulated its own policy (without the advice or participation of government), had final say in the resolution of a conflict about its legal objectives, and played an active role in the government's budget process. A single characteristic was used to judge the central bank's policy objective and accounted for 15 percent of the overall index. In this case, a central bank was judged most independent if its law specified a single objective for price stability. Its score was lower if the law specified multiple, compatible objectives including price stability, and lower still if its multiple objectives were potentially in conflict with price stability. The lowest scores obtained if the central bank's law stated no policy objectives or if these objectives did not include price stability. Finally, Cukierman, Webb, and Neyapti (1992) used eight characteristics to judge the limitations on central bank lending to the government, which accounted for 50 percent of the overall index. These characteristics are very precise and pertain to the type of lending and the maturity, interest rate, and magnitude of government borrowing. Taken together, these characteristics guarantee that the most independent of central banks would have at most a very limited role in the financing of government deficits.

The Cukierman, Webb, and Neyapti (1992) methodology is well-defined, straightforward, and widely recognized in the literature. We replicate this index using data for the end of 2003 from the IMF's database of central bank laws.<sup>1</sup> There are a few differences between the country sample in Cukierman, Webb, and Neyapti (1992) and our own, which are documented in Table 1. We have broadened their sample of 72 industrial and developing countries to include 12 additional developing countries for which central bank law has become available. Also, our sample includes 15 transition countries in central Europe and the former Soviet Union that have established central banks since the early 1990s.<sup>2</sup> The only monetary union in our sample is the euro area. Since the Cukierman, Webb, and Neyapti sample predates the formation of this union in 1999, there is a separate entry for each country in their sample that reflects the central bank of that country

<sup>1</sup> Cukierman, Webb, and Neyapti (1992) provide a detailed discussion of the 16 characteristics, the method used to score them, the weights used in aggregation, and the treatment of missing variables (see pp. 336–361). See Crowe and Meade (2007) for details of our dataset based on 2003 law.

<sup>2</sup> Cukierman, Miller, and Neyapti (2002) use their earlier methodology to rate central bank independence in 26 former socialist economies. Their study relies on laws enacted in the 1990s and includes a slightly larger set of transition countries than included in our sample. Our independence measure is more up-to-date, as central bank law in many transition countries has been revised since the late 1990s. In particular, countries in central and eastern Europe have made amendments relating to membership in the European Union and prospective adoption of the euro.

Table 1

**Central Bank Independence Scores: Coverage**

Common to both samples <sup>a</sup>	<p><b>Advanced Economies:</b> Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States</p> <p><b>Emerging Market and Developing Economies:</b> Argentina, Bahamas, Barbados, Bolivia, Botswana, Brazil, Chile, China, Colombia, Congo, Costa Rica, Egypt, Ethiopia, Ghana, Honduras, Hungary, India, Indonesia, Kenya, Lebanon, Malaysia, Malta, Mexico, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Serbia, South Africa, Tanzania, Thailand, Turkey, Uganda, Uruguay, Venezuela, Zambia, Zimbabwe</p>
Crowe–Meade only	<p><b>Emerging Market and Developing Economies:</b> Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Ecuador, El Salvador, Estonia, Guatemala, Jamaica, Kazakhstan, Kuwait, Latvia, Lithuania, Macedonia, Namibia, Oman, Paraguay, Russia, Slovakia, Slovenia, Sri Lanka, Trinidad and Tobago, Tunisia, Turkmenistan, United Arab Emirates</p>
Cukierman, Webb, and Neyapti only <sup>b</sup>	<p>Panama, Samoa, Taiwan, Province of China</p>

<sup>a</sup> We use the country classification scheme used by the IMF in its *World Economic Outlook* publication (which differs somewhat from the Cukierman, Webb, and Neyapti (1992) classification). Serbia replaces Yugoslavia in the updated sample.

<sup>b</sup> These countries were dropped from our sample due to unavailability of data on their 2003 central bank laws.

*Note:* We group the Crowe–Meade independence scores using the classification of advanced and emerging market/developing economies in the IMF's *World Economic Outlook*. However, we use Cukierman, Webb, and Neyapti (1992) country groupings when replicating their results; the main difference is that they classify Greece, Israel, Korea, Portugal, and Singapore as developing countries.

in the 1980s. In our sample, the independence score is identical for each euro area country and is based upon the statutes for the European Central Bank. Finally, we excluded three observations from the earlier study due to the relevant legislation not appearing in the IMF database: Panama, Samoa, and Taiwan, Province of China.

The results in the first two columns of Table 2 show that central banks have become far more independent than in the 1980s. Eighty-five percent of the central banks in our sample received a score above 0.4, compared with only 38 percent in the 1980s. Average independence has risen from about 0.3 in the 1980s sample to above 0.6 in ours. This increase in independence does not come about simply because we have included more countries in our sample. It is almost as great if we examine only the countries considered by Cukierman, Webb, and Neyapti (1992).

The remaining columns of Table 2 show a breakdown into advanced and emerging economies, with the categorization into each group explained in the notes under Table 1. For both groups of countries, there has been a noticeable shift towards greater central bank independence. Among advanced economies, the European Central Bank and Sweden's Riksbank ranked the most independent with

Table 2  
**Frequency Distribution of Central Bank Independence**

	<i>All countries</i>		<i>Advanced countries</i>		<i>Emerging market and developing countries</i>	
	<i>1980–89</i>	<i>2003</i>	<i>1980–89</i>	<i>2003</i>	<i>1980–89</i>	<i>2003</i>
$x \leq 0.2$	6	1	2	1	4	0
$0.2 < x \leq 0.4$	39	13	11	7	28	6
$0.4 < x \leq 0.6$	24	34	5	3	19	31
$0.6 < x \leq 0.8$	3	20	3	2	0	18
$x > 0.8$	0	28	0	13	0	15
<b>Total</b>	<b>72</b>	<b>96</b>	<b>21</b>	<b>26</b>	<b>51</b>	<b>70</b>

*Sources:* Data for the 1980–89 period is taken from Cukierman, Webb, and Neyapti (1992). Data for 2003 is based on authors' calculations.

*Notes:* "x" is a measure of central bank independence that can take a value from zero to one. See Crowe and Meade (2007) for additional details.

scores of 0.83 and 0.85, respectively, according to our updated measure. These scores are at least twice as high as those recorded in the study of 1980s data for these countries. For instance, the European Central Bank, whose statutes were specified in the Maastricht Treaty, has much greater independence today than its members' national central banks had in the 1980s with respect to the determination of monetary policy and lending to the government.

Interestingly, the Federal Reserve's score—at 0.48—is unchanged today from the 1980s because the underlying central bank law has not been amended. While the Fed's independence score in the Cukierman, Webb, and Neyapti (1992) study was significantly above the mean for the industrial countries in the 1980s, it ranks significantly below the mean for the advanced economies in 2003. By 2003, central banks in advanced economies had increased legal independence significantly in the areas of policy formulation and the monetary policy objective, and the Fed scores well below average with regard to these two aspects in the index. For instance, the Federal Reserve Act directs the Fed to achieve both high employment and price stability. As the employment objective could conflict with the price objective, the Fed scores lower than other central banks that have moved to unitary objectives for price stability. This comparison raises a distinction between legal independence, which we can measure, and actual independence, which we cannot. The Fed is historically a very independent central bank whose policies are credible around the world. It is less important to amend the Fed's legal statutes (if it ain't broke, don't fix it!) than it is to rewrite those of central banks that have not enjoyed actual independence or credibility.

Central banks in emerging market and developing economies have seen an even more impressive shift towards independence over the past two decades than their advanced-economy counterparts. Of the 15 central banks that we rate as highly independent, with scores above 0.8, two-thirds are located in eastern Euro-

pean countries. The National Bank of Poland registered the largest increase in independence since the 1980s—moving from a score of 0.1 in the Cukierman, Webb, and Neyapti (1992) study to just below 0.9 in ours—based upon substantial changes affecting all four aspects of independence included in the measure. But legal independence can be undermined if the government will not support it. Leszek Balcerowicz, the governor of Poland’s central bank, came under attack from government officials largely for operating what most view as an appropriate and credible monetary policy (*The Economist*, 2006).

The central bank of Bosnia and Herzegovina received the highest independence rating (0.98) of the 96 countries in our sample. Recognizing the importance of monetary and price stability for a country ravaged by civil war and hyperinflation, the Dayton Peace Accords signed in 1995 guaranteed the central bank’s independence in the country’s constitution (Article VII of the Constitution of Bosnia and Herzegovina, contained in Annex 4 of the Dayton Peace Accords). Moreover, the constitution and central bank law required that, for at least the first six years of operation, the central bank implement monetary policy via a currency board—a hard fixed exchange rate regime in which the monetary liabilities of the central bank are not to exceed its net foreign exchange reserves.<sup>3</sup> Violation of this currency board “rule” (according to Article 11.1a of the central bank’s statute) is grounds for dismissal of the governor or other members of the central bank’s board.

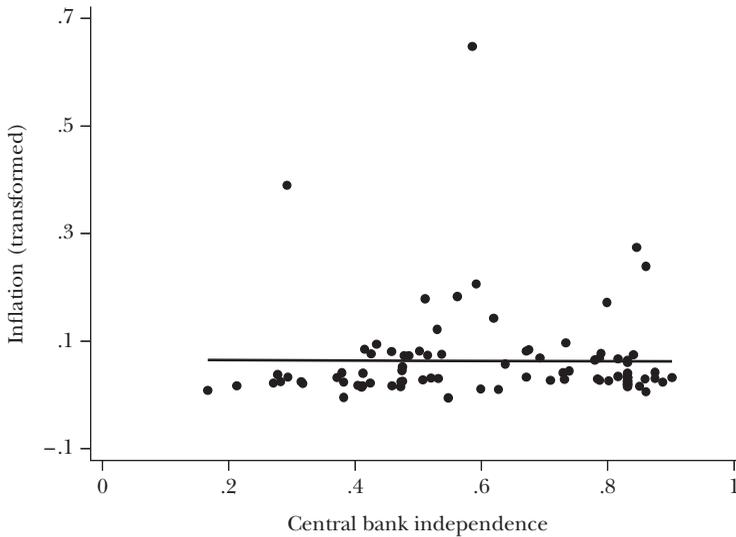
### **Implications of Central Bank Independence**

A key finding in the early literature on central bank independence, popularized in Alesina and Summers (1993), was a statistically significant association between greater independence and lower inflation for industrial countries (Eijffinger and De Haan, 1996, provide an extensive survey of empirical results). However, this inverse relationship did not hold for developing countries, as Cukierman, Webb, and Neyapti (1992) and other studies demonstrated. Figure 1 plots the average increase in consumer prices over 2000–2004 and our updated measure of central bank independence for the countries in our sample. As is common in this literature, inflation is transformed to lie on the unit interval (for positive values of inflation) in order to reduce the effects of hyperinflationary outliers (the transformation is that the rate of inflation  $\pi$  is measured as  $\pi/(1+\pi)$ ). There is no apparent inverse relationship between transformed inflation and independence in Chart 1, and none emerges when we separate the countries in the sample into industrial and developing country groupings. When we separate the countries into other groups, the only group of countries for which there is an obvious inverse relationship is the transition countries in central Europe.

Why is the inverse relationship between central bank independence and inflation no longer apparent for the industrial countries? The increase in central

<sup>3</sup> See Article 2.1 and Article 31.1 of the central bank’s legislation, available at <http://cbbh.ba>. In an examination of currency board regimes, Ho (2002) finds that Bosnia operates a truly orthodox system in that it does not violate the currency board “rule.”

Figure 1

**Transformed Inflation and Independence, All Countries, 2003**

*Note:* Figure 1 plots the average increase in consumer prices over 2000–2004 and our updated measure of central bank independence for the countries in our sample. Transformed inflation equals  $\pi/(1 + \pi)$  where  $\pi$  is the average annual increase in consumer prices during 2000–2004.

bank independence over the past two decades has paralleled a dramatic decline in the mean and variance of inflation. Inflation averaged 5.2 percent over the 1985–1989 period for the industrial countries in the Cukierman, Webb, and Neyapti (1992) study, but average inflation was less than half that over the 2000–2004 period for the advanced economies in our sample. The standard deviation of inflation dropped sharply as well, from almost 5 to 1 percentage points. Inflation shows an even more remarkable decline in the mean and standard deviation across the two time periods for developing economies. Perhaps the institutional characteristics of central banks are less critical when global inflationary pressures are subdued.

Another explanation could be that the legal measures of central bank independence that lie behind Figure 1 do not represent actual central bank independence. One measure of de facto central bank independence is the turnover of the central bank's governor. The reasoning is that with higher turnover, the central bank governor's term in office would shorten relative to that of the executive, making the governor more susceptible to political interference from the government and reducing the independence of the central bank.

Cukierman, Webb, and Neyapti (1992) measured turnover for each country as the average number of changes per year in the central bank's governor over the 1980–1989 period. (Cukierman and Webb (1995) provide additional detail on de facto central bank independence and its measurement.) We have constructed a turnover series for the 1995–2004 period using Morgan Stanley's *Central Bank*

*Table 3*  
**Rate of Turnover for Central Bank Governor**  
*(average number of changes per year)*

	<i>Mean</i>	<i>Standard deviation</i>	<i>Maximum</i>	<i>Implied length of term</i>
<i>Cukierman, Webb, and Neyapti (1980–1989):</i>				
Industrial	0.13	0.09	0.3	7.7
Developing	0.29	0.20	1.0	3.4
<i>Crowe–Meade (1995–2004):</i>				
Advanced	0.19	0.09	0.4	5.2
Emerging market & developing	0.21	0.16	0.9	4.8

*Directory* (2005). Our turnover series is intended to correspond to our updated measure of central bank independence. Owing to the unavailability of data for some countries, however, our turnover sample includes only 76 countries (22 advanced and 54 developing economies) covered by our updated independence measure.

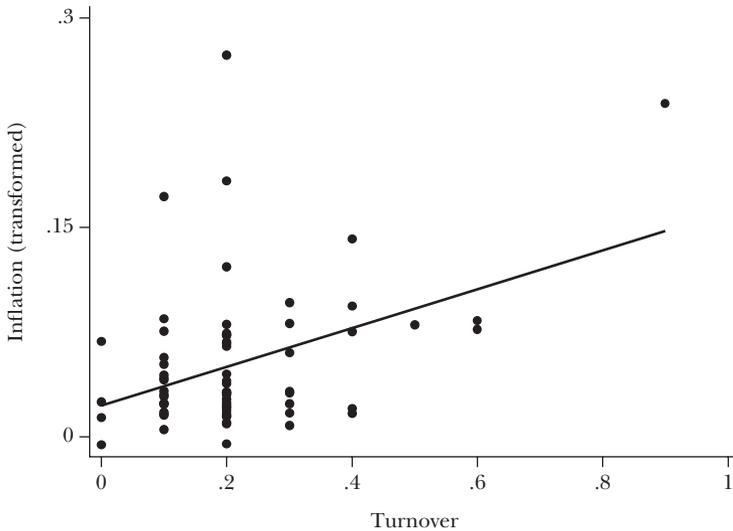
Table 3 provides summary statistics on turnover rates. Interestingly, average turnover of the central bank governor has risen for industrial (or advanced) countries and fallen for developing (and emerging market) countries since the 1980s.<sup>4</sup> Absolute mean turnover remains higher in emerging and developing countries than in advanced ones. The maximum turnover rates correspond to a term in office for the central bank’s governor of two-and-a-half to three years in industrial countries (good examples are Japan in the 1980s sample and Austria in the more recent one) and just one year in developing countries (examples would be Argentina in the 1980s sample and Ecuador in the recent one). Furthermore, average turnover is positively correlated with transformed inflation, as shown in Figure 2. Finally, our measure of turnover and our measure of central bank independence have a correlation that is close to zero. In other words, our measure of central bank independence has little power to predict turnover, which suggests that turnover may be capturing some other dynamic.

A natural next step is to attempt a statistical analysis of the relationship between central bank independence and inflation. While we and others have estimated such regressions, such estimates are fraught with difficult issues of causality and omitted variables. For example, imagine a simple cross-section regression using country data with the rate of inflation as the dependent variable and the independent variable as the level of central bank independence. As shown in Figure 1, central bank independence does not have a strong correlation, positive or negative, with the rate of inflation. One interpretation of this finding is that central

<sup>4</sup> The rise in turnover for heads of central banks in industrial (advanced) countries is not due to the fact that we included Greece, Israel, Korea, Portugal, and Singapore in the grouping whereas Cukierman, Webb, and Neyapti (1992) classified these countries as developing.

Figure 2

**Transformed Inflation and Turnover of the Central Bank’s Governor, All Countries**



Notes: Transformed inflation equals  $\pi/(1 + \pi)$  where  $\pi$  is the average annual increase in consumer prices during 2000–2004. “Turnover” measures the average annual turnover of the central bank’s governor between 1995 and 2004.

bank independence doesn’t much matter, but given the large changes in governance all around the world and the decline in inflation, this interpretation seems tendentious. Another interpretation is that countries with relatively low inflation don’t tinker with their central bank governance, while countries with high inflation make their central bank more independent. The result is a world where inflation is low in most countries, even with a range of central bank governance arrangements.

A similar issue can be raised for regressions that use turnover of the top central bank governor to predict inflation rates. If governments in high-inflation countries replace the central bank governor to improve inflation performance, then higher turnover might reflect a social desire for reduced inflation, rather than an absence of central bank independence.

Given these concerns, an obvious approach is to go beyond bivariate regressions and try to adjust for other factors. In these studies, it is common to include both legal measures of central bank independence (which can be an overall measure or several different components) and a de facto measure of central bank independence like turnover of governors, as well as control variables for the exchange rate regime, openness to trade, per capita GDP, and a measure of democracy. Constant terms and controls for fixed country effects can also be included. These regressions can either be done in terms of levels of the variables or in terms of changes in the variables over time.

Of course, multivariate regressions of this type continue to face grave difficul-

ties of interpreting directions and channels of causality, but in running these kinds of regressions, some results are fairly common, both in our own work and in earlier studies like Cukierman, Webb, and Neyapti (1992). When both legal measures of central bank independence and turnover rate are included as explanatory variables, along with control variables, the coefficient on turnover often has a significant effect on reducing inflation, and the coefficient on the legal measure of central bank independence sometimes has a significant correlation with lower inflation. In calculations that disaggregate the legal measures of central bank independence, the change in central bank objectives seems to matter the most for inflation. This finding suggests that the central bank's stated objectives are not just cheap talk, but are associated with a stronger commitment to price stability.

### **Downsides to Central Bank Independence**

Greater independence for a central bank must be reconciled with the requirements of institutional and personal accountability in a democratic society. For example, Bank of Italy Governor Antonio Fazio came under investigation during 2005 for improprieties associated with a bank merger deal. As evidence of Fazio's wrongdoing mounted, Italian and European officials called for his resignation. Fazio, however, was protected by the central bank's statutes which granted him a life term in office. In most indexes of central bank independence, including ours, life tenure is counted as a greater degree of independence than a term with limits. Although Fazio did resign eventually, amid efforts to amend Italy's central bank law to permit his dismissal, the experience pointed out one problem that can arise from a high level of independence (*The Economist*, 2005).

Perhaps more troubling from the perspective of democratic accountability is the independence of the nascent European Central Bank. The European Central Bank is a supranational institution that was created by a treaty ratified by 15 national parliaments; any amendment of its statutes would require approval from all the members of an expanding European Union and therefore is unlikely to occur.

Countries have addressed the accountability of independent central banks both by limiting the mandate of the central bank and by requiring it to be accountable to the public. Accountability will tend to be greater when the central bank is given a narrower mandate; Debelle and Fischer (1995) call this "instrument independence." In this case, the government assigns the central bank a target to achieve and the instruments necessary to achieve it. For example, in the United Kingdom, the government gives the Bank of England independence so that it may achieve the government's inflation target of 2 percent. This narrow mandate can be contrasted with a situation in which the government gives the central bank a broad mandate that requires interpretation; Debelle and Fischer call this "goal independence." The Federal Reserve Act, for example, tasks the U.S. central bank with seeking "maximum employment, stable prices, and moderate long-term interest rates." The Fed must interpret and prioritize these goals, and determine what inflation rate is consistent with its mandate.

With regard to public accountability, most central banks are required to report

on and explain their actions to the legislature and to the broader public. As independence has increased over the past two decades, so has transparency, and it is this topic to which we now turn.

## Central Bank Transparency

A central bank that is transparent does a good job of communicating its intentions to the public and thereby reducing the public's uncertainty about what it is trying to achieve (Blinder, Goodhart, Hildebrand, Lipton, and Wyplosz, 2001; Faust and Svensson, 2001; Geraats, 2002). Central banks influence directly only the short-term interest rate, but for monetary policy to be effective, they must influence longer rates as well by signaling movements in future policy and anchoring inflation expectations. In this way, transparency and good communication should improve the effectiveness of monetary policy.

### Measuring Central Bank Transparency

Unlike central bank independence, for which measurement abounds, relatively few attempts have been made to measure central bank transparency. Blinder, Goodhart, Hildebrand, Lipton, and Wyplosz (2001) have reviewed transparency practices in five industrial country central banks and categorized their practices according to whether they communicate the central bank's objectives, the methods the central bank uses in making decisions, and the decisions themselves. Eijffinger and Geraats (2006) elaborated on this categorization, developed an explicit methodology for measuring transparency, and used it to code the practices of nine major central banks based on information from 1998 to 2002. We will follow their categorization into five categories. First, *political transparency* pertains to the clarity of the central bank's legal mandate. Second, *economic transparency* refers to the publication of the economic data, models, and forecasts used by the central bank to arrive at its policy decisions. Third, *procedural transparency* is the communication of the explicit policy strategy as well as information on the decision-making process. Fourth, *policy transparency* includes the timely announcement and explanation of policy actions, and some indication of likely future actions. Fifth, *operational transparency* is the discussion of economic disturbances and policy errors that are likely to affect the transmission of policy.

Our transparency measure is designed to satisfy two main objectives. First, we wanted broad country coverage, beyond just the advanced economies. Table 4 lists the 40 countries in our sample. Second, we wanted to compare current transparency practices with those from an earlier time. We therefore constructed a measure of transparency practices using answers from a 1998 survey of central banks conducted by Fry, Julius, Mahadeva, Roger, and Sterne (2000). Fry and his coauthors designed a detailed questionnaire covering key topics in central bank objectives and operations. Ninety-four central banks completed the questionnaire during 1998, and Fry and his coauthors analyze and provide the responses of individual

Table 4

**Transparency Country Sample***(countries with formal inflation targeting regimes in italics)*

Advanced economies (26)	<i>Australia</i> , Austria, Belgium, <i>Canada</i> , Denmark, Finland, France, Germany, Greece, <i>Iceland</i> , Ireland, <i>Israel</i> , Italy, Japan, <i>Korea</i> , Luxembourg, Netherlands, <i>New Zealand</i> , <i>Norway</i> , Portugal, Singapore, Spain, <i>Sweden</i> , Switzerland, <i>United Kingdom</i> , United States
Emerging market and developing economies (14)	Argentina, <i>Brazil</i> , China, <i>Czech Republic</i> , <i>Hungary</i> , India, <i>Indonesia</i> , <i>Mexico</i> , <i>Poland</i> , Russia, Slovakia, Slovenia, <i>South Africa</i> , <i>Turkey</i>

*Note:* We were unable to code a transparency measure for Brazil, Denmark, and Japan owing to inadequate data.

central banks. Based on these responses, we were able to code a transparency measure for 37 of the 40 countries in our sample. (We were unable to code Brazil, Denmark, and Japan due to some missing entries.)

In constructing our transparency index, we included two questions for each of the five categories for which we had information from both 1998 and from a more recent analysis of information available in English from central bank publications and websites. These ten questions are provided in Table 5.<sup>5</sup> The total transparency score was computed as the unweighted average of the component scores. Our updated scores range from a low of 0.15 in China, India, and Singapore to a high of 1.0 in the United Kingdom.

Table 6 provides the mean transparency scores based on the 1998 questionnaire, and our 2006 update for all countries and for several subgroups. Overall, central bank transparency has changed little since 1998. Were we able to measure transparency over a longer time interval, we would expect to see a marked rise in transparency. Increases in central bank disclosure have been underway since the early 1990s, but we have no way to measure those increases systematically until 1998 (when the survey was done). Thus, our results tend to underestimate improvements in transparency. Between 1998 and 2006, however, some important changes occurred for particular categories of central banks. In particular, advanced economies saw a statistically significant rise in central bank transparency.

Enhanced transparency practices are seen as an important component of formal inflation targeting regimes (Bernanke, Laubach, Mishkin, and Posen, 1999). Thus, we find no significant change in transparency between 1998 and 2006 for central banks that had already adopted inflation targeting before 1998, but a large and significant increase in transparency for the central banks that adopted inflation targeting after 1998. The European Central Bank has higher transparency than did the national central banks of the twelve euro area countries in 1998.

<sup>5</sup> The Eijffinger and Geraats (2006) measure was based on three questions in each of the five transparency categories. There is a substantial degree of overlap between their questions and ours. See Crowe and Meade (2007) for a full description of transparency measurement.

Table 5  
**Transparency Measure**

Category of transparency	Questions	Coding
(1) Political	1.1: Is there a statutory objective?	<b>1:</b> Single objective of price stability or price stability objective does not conflict with other objectives <b>.5:</b> Price stability objective potentially conflicts with other objectives <b>0:</b> Objectives do not include price stability or there is no objective
	1.2: Is there an explicit numerical target for prices or inflation?	<b>1:</b> Yes <b>0:</b> No
(2) Economic	2.1: Does the central bank publish surveys (conducted by itself or others) that could be used to estimate inflation expectations?	<b>1:</b> Yes <b>0:</b> No
	2.2: Does the central bank publish any forward-looking analyses such as forecasts?	<b>1:</b> Words AND numbers/figures <b>.5:</b> Words OR numbers/figures <b>0:</b> Neither
(3) Procedural	3.1: Does the central bank publish minutes of policy meetings?	<b>1:</b> Yes <b>0:</b> No
	3.2: Does the central bank publish voting patterns of the monetary policy committee?	<b>1:</b> Yes <b>0:</b> No
(4) Policy	4.1: Does the central bank publish explanations on the same day that policy changes?	<b>1:</b> Yes <b>0:</b> No
	4.2: Does the central bank publish an explanation on its meeting days even when there is no change in policy?	<b>1:</b> Yes <b>0:</b> No
(5) Operational	5.1: Does the central bank publish discussion of risks to the outlook or forecast?	<b>1:</b> Words AND numbers/figures <b>.5:</b> Words OR numbers/figures <b>0:</b> Neither
	5.2: Does the central bank publish discussion of shocks or forecast errors after the fact?	<b>1:</b> Yes <b>0:</b> No

Source: The source for question 1.1 is from the Crowe-Meade independence measure, based on 2003 law. The sources for all other questions are the websites and publications of the central banks. For some countries, information in English is provided with a delay. We did not consider the language of the information when measuring transparency. The overall transparency index is defined as an unweighted average of 5 categories; each category is an unweighted average of all subcategories.

Table 6  
**Mean Transparency Scores**

	<i>Number of countries</i>	<i>1998</i>	<i>2006</i>
<i>All countries</i>	37	0.56	0.61
<i>By level of development</i>			
Advanced	24	0.56	0.64**
Emerging market and developing	13	0.55	0.54
<i>Inflation targeting</i>			
Inflation targeting adopted by 1998	8	0.73	0.78
Inflation targeting adopted after 1998	8	0.56	0.71*
<i>Euro members</i>	12	0.45	0.60***
<i>Others</i>	9	0.54	0.38

*Source:* Mean transparency scores are based on the 1998 questionnaire and our 2006 update for all countries and for several subgroups.

*Note:* We were able to code a transparency measure for 37 of the 40 countries in our sample. (We were unable to code Brazil, Denmark, and Japan due to some missing entries.)

\*, \*\*, \*\*\* indicate the difference in mean is statistically significant at the 90, 95, and 99 percent confidence levels, respectively.

Nevertheless, the level of European Central Bank transparency remains well below the average level of inflation-targeting central banks. (The European Central Bank is not considered to have an inflation-targeting regime even though it has an overriding goal of price stability and attempts to keep inflation close to or below 2 percent per year. This is primarily because the European Central Bank discloses much less information than true inflation-targeting central banks.) For the nine remaining central banks in our sample, there was a sharp, statistically insignificant decline in transparency from 1998 to 2006. The main culprits were the central banks in China and Russia whose scores dropped by 0.5 or more; central banks in India, Singapore, and the United States registered much less pronounced declines. For some developing countries, a drop in transparency may have reflected the central bank's increased desire to conceal information from market participants.

There is reason for caution in interpreting the change from 1998 to 2006. For example, some central banks may publish significantly more information—and on a more timely basis—in their country's own language than in English (particularly those with little foreign participation in domestic money markets). Moreover, central banks completing the survey in 1998 may have interpreted the relevant questions differently—and less consistently across countries—than we did in compiling our 2006 scores. In the case of the Federal Reserve, for example, the small drop in its transparency rating between 1998 and 2006 belies the many steps the Fed has taken over the period to raise transparency, which are listed in Table 7 (the table also includes important steps beginning with the first major change in 1993). Of the changes listed since 1998, only the first one in May 1999—when the Fed began making an announcement at the conclusion of all of its meetings, including those for which monetary policy was unchanged—is picked up in our transparency

Table 7

**Selected Changes in Fed Communication Practices, 1993–2004**

November 1993	Decided to release lightly edited transcripts of FOMC meetings for all prior meetings for which a tape existed.
February 1994	For the first time, Chairman Greenspan announced a decision to raise federal funds rate at the conclusion of the policy meeting.
February 1995	Made official the informal policy of announcing decisions of change in policy stance immediately after a policy meeting. Agreed to continue to release lightly edited transcripts of meetings after a lag of five years.
August 1997	Included a numerical target for federal funds rate in the policy directive.
May 1999	Began issuing a statement at the conclusion of every meeting, not just after meetings at which policy was changed. Began announcing bias in the policy directive (an indicator of future policy) at the conclusion of meeting (accelerating the release of this information by about six weeks).
February 2000	Bias in the policy directive was replaced with a statement about the balance of risks with respect to long-run goals for price stability and economic growth in the foreseeable future.
May 2002	Began releasing roll call vote on the federal funds rate target and the preferred policy for dissenters at the conclusion of the meeting (accelerating the release of this information by about six weeks).
March 2003	Deliberately refrained from the “balance of risks” language. Instead, encouraged “heightened surveillance.”
May 2003	Modified language in balance-of-risks statement. Began issuing separate statements about upside and downside risks to inflation and growth.
August 2003	“Balance of risks” was replaced with “considerable period” language.
December 2004	Began publishing meeting minutes three weeks after each meeting (accelerating their release by about three weeks).

measure. All of the subsequent modifications reflect an acceleration of information already provided, or a change in language intended to give an improved signal of future monetary policy. Similarly, the People’s Bank of China has introduced a number of measures to improve transparency and communication which are not reflected in our index.

**Implications of Transparency**

In the theoretical literature, the degree of central bank transparency has implications for average inflation and output and for the volatility of inflation, output, and interest rates (Geraats, 2002, reviews the relevant literature). Few studies, however, have examined the empirical effects of transparency. Chortareas, Stasavage, and Sterne (2002) used the survey data collected by Fry, Julius, Mahadeva, Roger, and Sterne (2000) to investigate the effects of a specific type of transparency: the publication of central bank forecasts, and the assessment of risks and earlier forecast errors (questions 2.2, 5.1, and 5.2 of our measure). They found a statistically significant, inverse relationship between their measure of transparency and the level of inflation in a cross section of 82 industrial and developing

countries even after controlling for a number of other factors including central bank independence.

Although we also find an inverse relationship between our 2006 transparency score and average monthly inflation for the countries in our sample, shown in Figure 3, this relationship is not statistically significant. (Our inflation measure is the mean of the twelve-month change in consumer prices from July 2003 through June 2006.) This inverse relationship is more pronounced when the advanced economies are excluded, but it remains insignificant. We also computed a transparency measure akin to that used by Chortareas, Stasavage, and Sterne (2002) by averaging the answers to questions 2.1, 5.1, and 5.2 (their transparency measure is constructed using a Guttman scale, not a simple average). For that measure as well, we found an inverse relationship with average inflation that was statistically insignificant.

Other empirical studies that have focused on the adoption of an inflation target have examined whether this regime is associated with improved accuracy of private sector inflation forecasts or a reduction in the variance of those forecasts. The findings in this literature are mixed, but Crowe (2006) provides evidence that the adoption of inflation targeting led to lower forecast errors for the worst forecasters in the private sector (those with the highest initial errors), based on a comparison of forecasters in countries that adopted inflation targets with a matched sample of forecasters in countries that did not.

We too find a link between transparency and inflation forecast uncertainty. To measure inflation forecast uncertainty, we used the average standard deviation of monthly one-calendar-year-ahead forecasts for consumer price inflation over a 36-month period (July 2003 through June 2006) collected from private sector forecasters and published by *Consensus Economics*. The forecast standard deviations were available for only 28 of the 40 countries in our sample.<sup>6</sup> We looked at countries by level of development. For advanced economies—euro area countries, Japan, and the United States—inflation forecast uncertainty is very low, even without an especially high level of transparency. For emerging market and developing economies, greater transparency has little effect on the uncertainty of inflation forecasts if the country has an inflation target, but for emerging and developing countries without an explicit inflation target, greater transparency is associated with a reduction in inflation forecast uncertainty.

### **Drawbacks to Transparency**

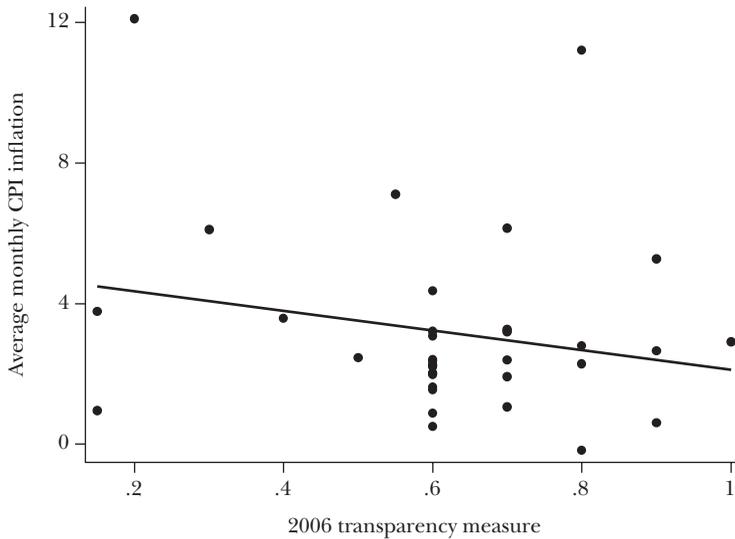
Any attempt to rank central banks by their degree of transparency seems to suggest both that greater transparency is better and that it can be achieved in an identical way by each central bank. We are wary of both of these interpretations.

The rationale for transparency is that it will reduce uncertainty through better

<sup>6</sup> *Consensus Economics* does not publish individual forecasters' predictions for Austria, Belgium, Denmark, Finland, Greece, Iceland, Ireland, Israel, Luxembourg, Portugal, Slovenia, and South Africa (although it does publish mean forecasts for some of these countries).

Figure 3

Average Inflation and Transparency, All Countries



Note: Country sample excludes China owing to unavailability of inflation data. Inflation is measured as the average of 12-month changes in consumer prices from July 2003 through June 2006. Although we find an inverse relationship between our 2006 transparency score and average monthly inflation, this relationship is not statistically significant.

communication of the central bank’s goals and procedures. However, transparency can lead to offsetting changes within the central bank’s decision-making procedures. For example, some have claimed that the deliberations in the Federal Reserve’s monetary policy meetings changed fundamentally in 1993 with publication of verbatim meeting transcripts. In this case, greater transparency may have reduced the quality of discussion in the policy meeting (the frank give-and-take that is so important for true deliberation), or it may have shifted discussion to another less observable forum (Meade and Stasavage, forthcoming; Swank, Swank, and Visser, 2006).

Indeed, transparency can even increase, rather than reduce, uncertainty. Morris and Shin (2002) pose a theoretical model in which, if the private sector attempts to second-guess itself, then public information (acting as a focal point for beliefs about beliefs) can crowd out high-quality private information. Admittedly, the model in Morris and Shin (2002) is controversial (Svensson, 2006), and furthermore, Crowe (2006) finds no empirical evidence to support it. But the possibility that greater transparency may not always reduce uncertainty should be borne in mind.

Finally, the optimal communications practices for a central bank may not be “one size fits all.” Instead, optimal practices may depend upon the type of monetary policy committee that a central bank has; for example, Geraats (2006) demonstrates that disclosure practices vary widely across monetary policy frameworks.

Blinder (2004) has argued that different types of committees organize decision making in different ways and should therefore communicate differently. The organization of central bank committees and decision making is one of the subjects discussed in the most recent work on central bank governance; we turn now to these issues.

## **Organization of Central Bank Committees and Decision Making**

Virtually every central bank makes decisions by committee. In the late 1990s, reforms at the central banks in Britain and Japan replaced a single policymaker with a monetary policy committee. Today, the Reserve Bank of New Zealand is one of the few remaining central banks with a lone governor setting short-term interest rates. How large are the central bank committees that formulate monetary policy? How are these committees structured? Do officials express their own individual views about the appropriate policy setting or does the committee express a single view? Recent work on central bank governance examines these questions.

Using a laboratory approach, Blinder and Morgan (2005) determined that committees composed of five individuals generally made better decisions than an individual decisionmaker in an artificial monetary policy experiment. Moreover, groups did not require more information or evidence than individuals before making their decision, eliminating a possible drawback to committees. They did not find any evidence that monetary policy should be determined by an individual acting alone.

What is the optimal size for a committee? Sibert (2006) suggests that the optimal committee size may be about five, yet many monetary policy committees exceed the five members that Blinder and Morgan (2005) used in their experiments. For instance, 19 policymakers participate in meetings of the Federal Open Market Committee of the Federal Reserve, and twelve of them cast an official vote on policy. The Governing Council of the European Central Bank comprises 19 voting officials for the 13 countries currently in the monetary union and will grow further as additional countries in the European Union join. It is plausible that deliberation and decision making become more arduous and time consuming as committee size increases. However, most monetary policy committees are substantially smaller than the Federal Open Market Committee or the Governing Council. According to Lybek and Morris (2004) who reviewed policy committees in 50 central banks, 50 percent had seven to nine members while another 28 percent had four to six members.

Some monetary policy committees include regional representatives. In such a situation, these representatives may give extra weight (perhaps unintentionally) to the economic situation in their particular regions. Some domestic central banks—like the Federal Reserve—include voting regional representatives in their policy committees. The presidents of the Fed's 12 regional reserve banks participate in meetings of the Federal Open Market Committee, although only five of them cast

a vote in any given meeting (thus, the “regional” vote is smaller than the vote cast by the seven governors who sit at the center of the Fed system). In monetary unions, where the member countries supply national representatives to the union’s monetary policy committee, the temptation to emphasize national concerns may be even greater. The “regional” vote in the European system by 13 national central bank presidents is larger than the votes cast by six governors at the center of the system. At least under current rules, this imbalance toward a “regional vote” will rise as new countries join the euro area.

To analyze regional influences, one must examine the decisions of individual policymakers. Very few central banks publish their policymakers’ voting records and, because there are few committees for which regional representation is a concern, the Federal Reserve—which both publishes votes and has regional representatives—has been the focus of analysis. Meade and Sheets (2005) found that the unemployment rates in different Fed regions had a significant, robust effect on Federal Open Market Committee votes cast during the 1978–2000 period; Fed officials were more likely to lower interest rates when their region’s unemployment rate was above the national average (and conversely). This regional effect remains statistically significant when official votes are replaced by the opinions expressed by individual policymakers at Federal Open Market Committee meetings (Chappell, McGregor, and Vermilyea, 2006). (Opinions expressed by Federal Reserve policymakers can be collected from the Federal Open Market Committee transcripts which are published after a five-year delay.) However, no evidence suggests that this regional effect has resulted in a systematic bias in Fed monetary policy.

Some monetary policy committees suppress internal dissent from public view. The Governing Council of the European Central Bank, for example, claims to make decisions by consensus, but offers no voting records against which to assess this claim. The Bank of England’s monetary policy committee, on the other hand, publishes voting records and the preferred interest rate settings of its dissenters. Its policymakers agree to remain individually accountable for their decisions. Somewhere between these extremes is the Federal Open Market Committee, which has traditionally had a strong chairman and a low number of dissenting votes. However, the Federal Open Market Committee’s internal rates of disagreement, based upon opinions expressed during the discussion of policy proposals, are quite similar to dissent rates at the Bank of England (Meade, 2005). Blinder’s (2004) observation—that the ideal communications policy for the central bank will reflect its decision-making structure—is reflected in the transparency practices of these latter two central banks. The Bank of England’s “individualistic” committee provides each policymaker’s view even when the different views are at odds with one another. However, for a “collegial” committee such as the Federal Open Market Committee, different viewpoints may only confuse financial markets about the intentions of policymakers.

Different monetary policy objectives may well require a different organization of decision making, which in turn may necessitate a different means of communi-

cating with the public. However, we find it difficult to see a clear implication of central bank decision-making structures for monetary policy or the control of inflation.

## Concluding Remarks

The evolution of central banks since the 1980s, when economists first attempted to measure their institutional characteristics, has been dramatic. These changes have reflected at least four broad trends. First, central banks have sought a credible source of nominal price stability to replace the Bretton Woods system of fixed exchange rates that ended in the early 1970s. Discretionary policymaking in the hands of independent technocrats, rather than politicians, has gradually emerged. Policy reforms have therefore sought to buttress central bankers' independence, to make them suitably accountable, and to allow market participants to discern their intentions.

The second trend is the growing importance of global financial markets, particularly for medium-sized industrial economies and the major emerging market economies. Independent central banks with clear policy mandates, good communication strategies, and market-savvy, technocratic, management teams can reassure the markets and reduce the economic cost of political crises or mistakes.

A third trend involves changes in the international order. The collapse of communism and the promise of European Union accession in eastern European countries, combined with increased pressure for reform in other emerging markets following the financial crises of the 1990s, created a demand for new institutional forms. International financial institutions have also encouraged the rapid diffusion of "best practice."

Finally, the easier availability of information, due to the Internet and other technical innovations, has created new incentives for central banks, particularly for improved communication.

The combination of these factors together with developments in economic theory and understanding have led to a significant increase in central bank independence. Like earlier studies based on 1980s data, we do not find a dramatic effect of central bank independence on inflation. Interestingly, the most robust effect on inflation comes from the aspect of independence most closely related to transparency: having a clearly announced legal commitment to price stability. Transparency exhibits a less drastic evolution over time. However, for certain subgroups—notably countries that adopted formal inflation targets and countries that joined the euro area—the increase in transparency is significant. As central banks have become more independent and transparent, the study of central bank governance has turned to issues of documenting the sizes of monetary policy committees and their preferable decision-making structures.

This renewed focus on the central banker and the central bank represents a return to questions posed by Walter Bagehot ([1873] 1915) in the nineteenth century. An entire chapter of his book *Lombard Street* deals with central bank

management and decision making. The issues raised there will be familiar to the modern reader: preserving accountability while insulating central bankers from political interference; ensuring central bankers devote their attention to their official duties; calculating the optimal size for decision-making committees; and obtaining financial sector representation in central bank decision making while preventing capture of the central bank by the financial sector. While we chart the evolution of central bank governance in the recent past, it is useful to remember the vintage of the literature's central concerns. We offer "old wine in new bottles" without apology.

■ We thank Kathryn Dominguez, Petra Geraats, Charles Goodhart, Jim Hines, Tonny Lybek, David Stasavage, Jeremy Stein, and Timothy Taylor for their comments on an earlier draft, Gabriel Sterne for useful discussions, and Michael Callen and Martin Minnoni for excellent research assistance. The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

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