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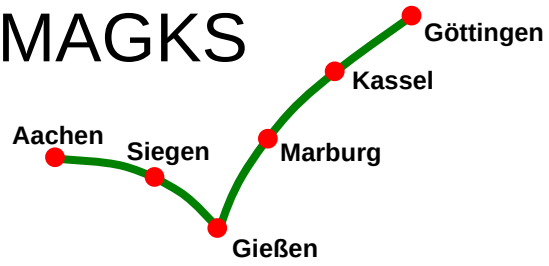

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Central Bank Transparency and Financial Market Expectations: The Case of Emerging Markets

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Central Bank Transparency and Financial Market Expectations: The Case of Emerging Markets

Abstract

In this paper, we study how central bank transparency influences the formation of money market expectations in emerging markets. The sample covers 25 countries for the period from January 1998 to December 2009. We find, first, that transparency reduces the bias (the difference between the money market rate and the weighted expected target rate over the contract period) in money market expectations. The effect is larger for countries with no exchange rate peg and countries with low income. Second, an intermediate level of transparency is found to have the most favorable influence on money market expectations: neither complete secrecy nor complete transparency is optimal. Finally, all subcategories of the Eijffinger and Geraats (2006) index lead to a smaller bias in expectations, with political transparency having the largest effect.

JEL: E52, E58

Keywords: Central Bank Transparency, Emerging Markets, Financial Market Expectations, Interest Rates, Monetary Policy, Money Market.

1. Introduction

Over the past two decades, central banks have expended a great deal of effort on increasing their transparency. Central bank objectives and goals have been specified and quantified, macroeconomic forecasts are published, interest rate decisions are announced and explained immediately, and some central banks provide indications of the likely course of monetary policy in the near future. Consequently, there is a vast empirical literature on central bank transparency, most of which finds beneficial effects of such transparency. For example, van der Cruijsen and Eijffinger (2010) review the literature and conclude that transparency (i) improves consensus across forecasters, (ii) lowers inflation and anchors inflation expectations, (iii) improves the credibility, reputation, and flexibility of central banks, (iv) has no obvious influence on output and output variability, and (v) improves policy anticipation.[1] Most of this literature focuses on mature economies, but central banks in emerging markets have also been hard at work on increasing their transparency.

Figure 1 shows the minimum, median, and maximum transparency index for the 25 emerging markets in our sample[2] versus nine often studied advanced economies.[3] Transparency is higher in advanced economies, but there is a noticeable trend of increasing transparency in emerging markets during the first half of the sample period (1998–2003). However, in the second half of the sample period (2004–2009), there is no change in minimum, median, and maximum transparency of the emerging markets. Siklos (2011) concludes that it is unclear whether this break reflects limits to central bank transparency or, to some extent, transparency "fatigue." Regardless of the reason for it, in the empirical analysis below, we explicitly control for this break.

Despite these developments in the late 1990s and early 2000s, empirical evidence about the influence of central bank transparency on emerging markets is scant. Fatas et al. (2007) analyze the effect of a formal quantitative monetary policy target (exchange rate target, money growth target, inflation target) in 42 advanced and emerging countries over the period 1960–2000. They find that a de jure target tends to lower inflation and smooth business cycles and that hitting the target de facto increases

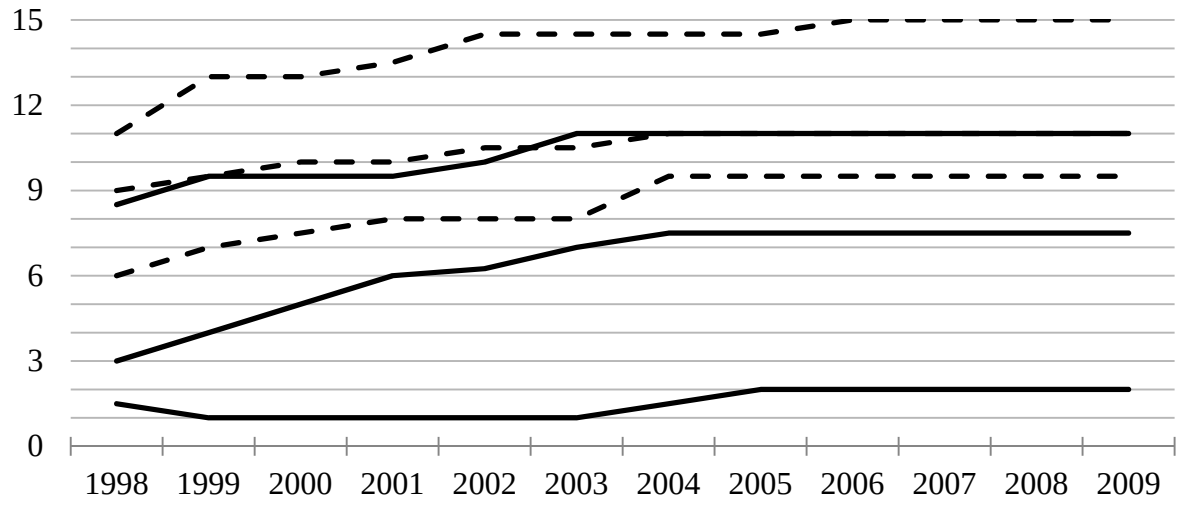
[1] A more detailed and formal overview of the empirical results can be found in van der Cruijsen (2008, 30).

[2] Sample countries: Argentina, Brazil, Bulgaria, Chile, Colombia, the Czech Republic, Hong Kong, Hungary, India, Indonesia, Jordan, Korea, Kuwait, Latvia, Lithuania, Pakistan, Peru, Philippines, Poland, Romania, Russia, Singapore, South Africa, Thailand, and Turkey. Sample selection is explained in the next section.

[3] Australia, Canada, the European Monetary Union, Japan, New Zealand, Sweden, Switzerland, the United Kingdom, and the United States.

the positive effects. Chortareas et al. (2002a) construct a transparency index based on forecasts from 87 central banks worldwide covering the period 1995–1999. These authors find that greater transparency in forecasts is associated with lower inflation for countries with an inflation target or a monetary target, but not for countries with an exchange rate anchor. Output variability is unaffected. In addition, Chortareas et al. (2002b) examine the influence of transparency in forecasting and decision-making on the costs of disinflation. The sacrifice ratio is negatively related to transparency in forecasting but not to transparency in the decision-making process.

Figure 1: Transparency Index for 25 Emerging Markets and Nine Advanced Economies



Source: Siklos (2011) and own calculations.
Note: The solid lines show the minimum, median, and maximum transparency index observed in our sample of 25 emerging markets. The dashed lines show the corresponding measures for nine advanced economies.

Dincer and Eichengreen (2009) construct a broader index of transparency for 100 central banks and document a significant movement toward higher transparency during their sample period (1998–2006). Using transparency as an explanatory variable, they find that higher transparency is associated with less inflation variability. However, inflation persistence is not significantly affected by this trend. Van der Cruijsen et al. (2010) employ an index based on the same questionnaire but arrive at a different conclusion. They discover that transparency significantly reduces inflation persistence, but also detect an optimal intermediate degree of transparency (between 5.5 and 7.5) at which inflation persistence is minimized. Thus, central banks might not necessarily benefit from further increasing transparency. Middeldorp (2011) examines 24 emerging and advanced economies using the Dincer and Eichengreen (2009) data set. He finds

that transparency increases the accuracy and reduces the volatility of professional interest rate forecasts.

To date, the literature provides no emerging-market-specific conclusions and tends to focus on transparency's impact on inflation and output (for an exception, see Middeldorp, 2011). However, to conduct sound monetary policy, it is particularly important to know whether or not central bank actions are being correctly anticipated by financial markets.[4] In this context, Neuenkirch (2012) concludes—for nine mature economies—that a higher degree of central bank transparency improves the expectation formation process. Transparency reduces the expectation bias in the money market (namely, the difference between the money market rate and the weighted expected target rate over the contract period) and dampens variation in expectations. Coppel and Connolly (2003) find that the extent to which market participants anticipate changes in the policy rate has gradually increased since the late 1980s, as has the speed of reaction to interest rate announcements. Andersson and Hoffmann (2009) find evidence that the three central banks in their sample (the Reserve Bank of New Zealand, the Norges Bank, and the Riksbank) have been highly predictable in their monetary policy decisions, regardless of whether forward guidance involved publication of an own interest rate path.[5]

This paper fills the gap in the literature pertaining to emerging markets and examines the impact of transparency on the course of short-term interest rates. Our survey covers 25 emerging market countries for the period January 1998–December 2009. Econometrically, we employ an unbalanced panel least squares model to assess the following research questions. *First, does transparency decrease the expectation bias in money markets? If so, is the bias-reducing influence linear or non-linear? Second, are there subcategories of transparency (political, economic, procedural, policy, operational) that are particularly important for the formation of expectations?* We employ a variant of the bias indicator put forward in Neuenkirch (2012) and examine the influence of

[4] Woodford (2001) argues that if a central bank is more predictable, a larger number of counter-parties should be available to trade with the bank at a given (expected) price. The consequence is that a smaller change in the market price will be required to absorb a given change in the supply of a particular instrument.

[5] Many papers find beneficiary effects of transparency on policy anticipation in a single country: for instance, Demiralp (2001), Rafferty and Tomljanovich (2002), Lange et al. (2003), and Swanson (2006) for the United States, Lildholdt and Wetherilt (2004) for the United Kingdom, and Muller and Zelmer (1999) for Canada.

transparency as measured by Eijffinger and Geraats's (2006) broad index[6] (and its subcomponents) on the course of short-term interest rates.

The remainder of this paper is organized as follows. Section 2 introduces the data set and explains our econometric methodology. Section 3 presents the results for the influence of transparency on the central bank's ability to manage financial market expectations. Section 4 concludes.

2. Data and Econometric Methodology

2.1 Bias Indicator

As the dependent variable, we employ a variant of the indicator put forward in Neuenkirch (2012) that captures the deviation of money market rates from the expected target rate.[7] Consider a bond with a maturity of *n* periods. According to the term structure of interest rates, the bond's return equals a weighted average of the expected target for the overnight rate over that period. Equation (1) describes the relationship:

$$(1)\ interest\ rate_t^n = \prod_{i=0}^{n} E_t(target\ rate_{t+i})^{1/n},$$

where "interest rate" denotes the revenues on the bond with a maturity of *n* periods and $E_t(target\ rate_{t+i})$ the expected target rate *i* periods in the future based on all information available at the beginning of period *t*. Modern central banking is often described as the "art of managing expectations" (see, e.g., de Haan et al., 2007, 2). Thus, if a central bank is able to manage financial market expectations perfectly, the expectation operator on the right-hand side of Equation (1) disappears:

$$(2)\ interest\ rate_t^n = \prod_{i=0}^{n} target\ rate_{t+i}^{1/n}.$$

In the case of perfect management, the actual and "optimal" interest rate implied by the term structure of interest rates should be equal. Thus, the absolute difference between the interest rates—the "bias"—is a good proxy for the central bank's effectiveness:

$$(3)\ bias_t^n = \left| interest\ rate_t^n - \prod_{i=0}^{n} target\ rate_{t+i}^{1/n} \right|,$$

[6] Dincer and Eichengreen (2009) use the same questionnaire as Eijffinger and Geraats (2006). There are other indices, for instance, Crowe and Meade (2008), who use the Fry et al. (2000) data. However, these indices are not available as a time series covering the sample period investigated in this paper.

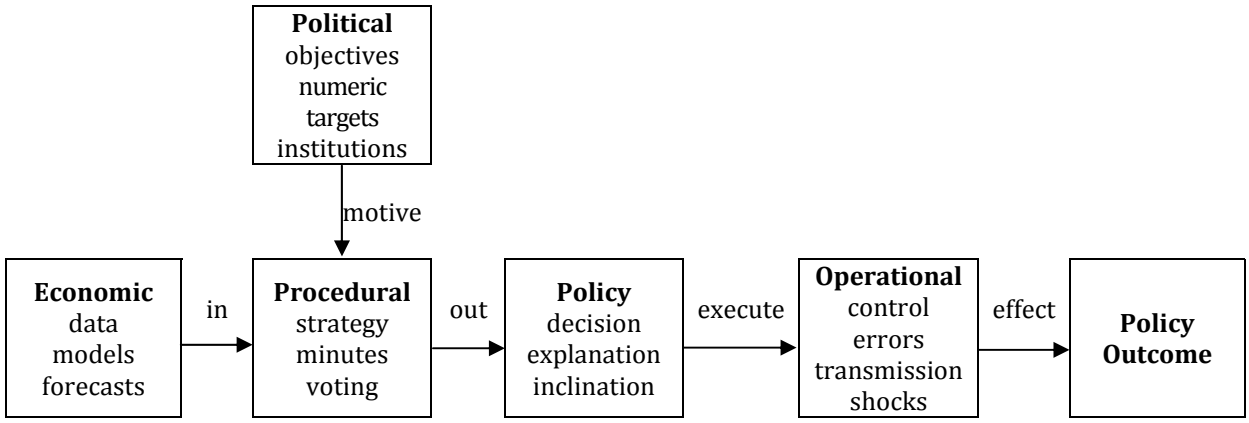
[7] For countries with a monetary target, we rely on the overnight interest rate as a proxy for the implicit target rate.

where "bias" measures the absolute difference between the actual interest rate and the "optimal" interest rate.

2.2 Transparency Index

In the next step, we need to parameterize central bank transparency. Geraats (2002) provides a theoretical framework for explaining the rationale behind increasing central bank transparency and the effects of different types of transparency. She differentiates between five types of transparency (see Figure 2). Eijffinger and Geraats's (2006) index, which was updated by Dincer and Eichengreen (2009) and Siklos (2011), captures all categories of this theoretical framework and is available as a yearly time series covering our sample period. For each category, three questions are asked about different aspects of transparency (an excerpt of the Eijffinger and Geraats (2006) questionnaire can be found in the Appendix). The index is available for every question and the total index is created as a sum of the scores for the 15 questions.

Figure 2: Theoretical Framework for Central Bank Transparency



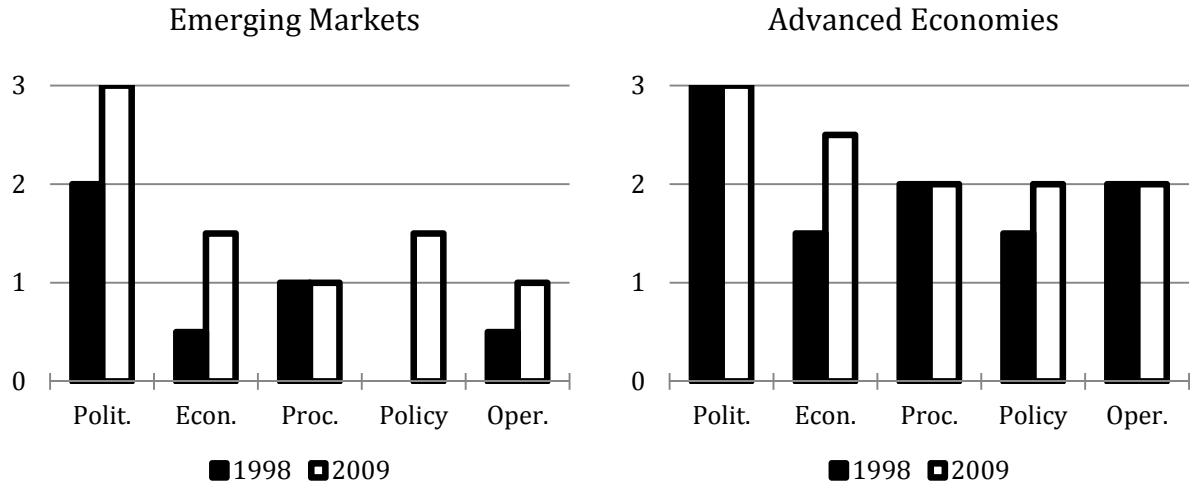
Source: Geraats (2002, 541).

It seems reasonable that each of the index's five subcategories would have a positive effect on steering financial market expectations or, put differently, to cause a decline in the bias. *Political transparency* reveals the central bank's policy objectives, ranks them according to their priority in the case of multiple goals, or quantifies a primary objective. *Economic transparency* refers to the economic information on which monetary policy is based, such as economic data, forecasts, or the central bank's economic model, thus allowing market participants to discover the central bank's view of the economy. *Procedural transparency* involves an explicit monetary policy rule or

strategy, an account of policy deliberations, and an explanation of how a policy decision was reached. *Policy transparency* involves the prompt disclosure (and explanation) of policy decisions and an explicit indication of likely future policy actions. *Operational transparency* has to do with discussing control errors in achieving operating targets and (unanticipated) macroeconomic disturbances. In addition to employing the overall index as an explanatory variable, we take advantage of the subindices and individual questions to discover which transparency factors are particularly important.

Since there are noticeable differences between the levels of transparency in emerging and advanced economies (see Figure 1), it will be useful to discover whether these differences are driven by particular subcategories. Figure 3 shows median transparency per category in our sample of 25 emerging markets (left panel) and nine advanced economies (right panel) in 1998 and 2009, respectively.

Figure 3: Transparency per Category in Emerging Markets and Advanced Economies



Source: Siklos (2011) and own calculations.
Note: Figure shows median transparency per category (political, economic, procedural, policy, operational) as observed in our sample of 25 emerging markets in 1998 and 2009 (left panel) and the corresponding figures for nine advanced economies (right panel).

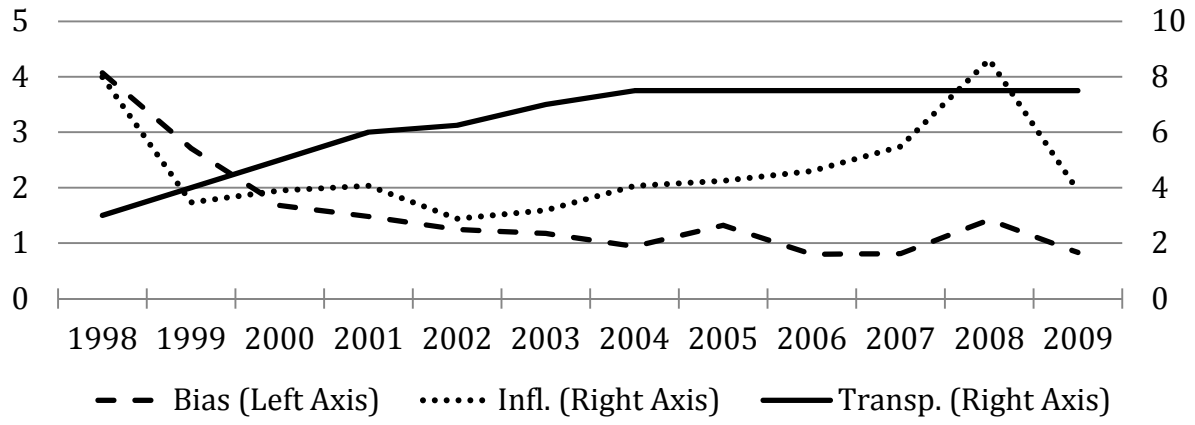
During the sample period, the emerging market countries have considerably improved all aspects of transparency except procedural transparency, which did not change over time (at least not at the median level). Most strikingly, the median level of political transparency is equal to that observed in advanced economies, with both groups reaching the maximum score of 3. However, the levels of economic, procedural, policy, and operational transparency in the emerging markets are 0.5–1 points lower than in the advanced economies.

2.3 Money Market Data

To estimate the bias in money market expectations, we utilize target rates and three-month money market rates at a monthly frequency for 25 emerging market countries over the period January 1998–December 2009.[8] The countries in our data set are: Argentina, Brazil, Bulgaria, Chile, Colombia, the Czech Republic, Hong Kong, Hungary, India, Indonesia, Jordan, Korea, Kuwait, Latvia, Lithuania, Pakistan, Peru, the Philippines, Poland, Romania, Russia, Singapore, South Africa, Thailand, and Turkey.[9]

Figure 4 plots the median bias (in percentage points; dashed line, left axis) and the median transparency index (solid line, right axis) for these countries.

Figure 4: Bias, Inflation, and Transparency Index for 25 Emerging Market Countries



Source: Siklos (2011), IMF, national central banks, and own calculations.
Note: The solid line shows the median transparency index (right axis), the dashed line the median bias (in percentage point; left axis), and the dotted line median inflation (in percent; right axis) observed in our sample of 25 emerging markets.

Figure 4 indicates a negative relationship between both variables, which is supported by descriptive statistics (correlation coefficient: –0.92). However, some of these countries faced relatively high and volatile inflation rates during the sample period. Hence, it is worthwhile to analyze whether the influence of inflation is another explanation for the bias. And, indeed, the figure shows a positive relationship between

[8] Source: IMF and national central banks. We choose monthly data as systematic daily data are available for only a handful of these countries.
[9] A country is considered as an emerging market if it is mentioned as such in at least one of the lists by Dow Jones, Standard and Poor's, and *The Economist* in 2009. Some emerging market countries are omitted from the analysis as (i) there is no transparency index available for them (Morocco and Taiwan), (ii) they became members of the euro area during the sample period (Estonia and Slovakia), or (iii) the data are insufficient (Bahrain, China, Egypt, Malaysia, Mauritius, Mexico, Oman, Qatar, Saudi Arabia, Sri Lanka, and the United Arab Emirates).

median inflation (in percent; dotted line, right axis) and the median bias (correlation coefficient: 0.42).[10]

2.4 Empirical Methodology

To analyze the influence of inflation and transparency on the bias in money market expectations, we use an unbalanced panel least squares model[11] with country fixed effects. The general specification is:

$$(4)\ bias_{t,j} = \alpha_j + \beta_1 inflation_{t,j} + \beta_2 X_{t,j} + \beta_3 (X_{t,j} \cdot transp._{t,j}) + \beta_4 transp._{t,j} + \beta_5 transp._{t,j}^2 + \beta_6 D_t + \beta_7 (D_t \cdot transp._{t,j}) + \beta_8 (D_t \cdot transp._{t,j}^2) + \varepsilon_{t,j},$$

where α_j and $\beta_1, \dots, \beta_8$ are parameters and ε is the error term. A subscript t indicates the month and j the country. Inflation is measured as the annual growth rate in the consumer price index.[12] Transparency also enters Equation (4) as a yearly measure. The vector $X_{t,j}$ contains several variables that have the potential to affect the bias in money market expectations.[13] First, we include separate dummy variables for countries (i) with an explicit inflation target (0: no inflation target, 1: inflation target)[14] and for countries (ii) with an exchange rate peg (0: no exchange rate peg, 1: pegged exchange rate).[15] Second, we include other dummy variables[16] that control for the influence of macroeconomic conditions on the bias in money market expectations (Dincer and Eichengreen, 2009). The variables indicate (iii) a low inflation rate (0: inflation < 5%, 1:

[10] Although transparency is found to reduce inflation and inflation expectations, this effect obviously lags the increase in transparency. In line with this idea, the contemporaneous relationship between median transparency and median inflation is relatively low (correlation coefficient: –0.14).
[11] There are some missing observations for seven of our sample countries.
[12] Source: IMF.
[13] Note that the indicator variables measuring the monetary policy regime or macroeconomic conditions can change over time. For instance, Poland introduced a direct inflation target in January 1999. Thus, the corresponding dummy variable for this country takes the value 0 until December 1998 and 1 thereafter.
[14] Source: IMF (2005) and national central banks. Argentina, Bulgaria, Hong Kong, India, Indonesia, Jordan, Kuwait, Latvia, Lithuania, Pakistan, Russia, and Singapore had no explicit inflation target in the period 1998–2009. The Czech Republic and Korea are the only countries with an explicit target during the full sample period. All remaining countries adopted an explicit target at some point during the period 1998–2009.
[15] Source: IMF. The IMF exchange rate classification distinguishes 10 different exchange rate regimes (of which eight can be loosely classified as some sort of a peg). According to this measure, Indonesia, Korea, and South Africa had a floating exchange rate during the entire sample period, whereas Bulgaria, Hong Kong, Jordan, Kuwait, Latvia, Lithuania, Malaysia, Qatar, and Singapore always pegged their exchange rate. All remaining countries changed their exchange rate regime at least once during the sample period.
[16] Since interaction terms of two continuous variables cannot be interpreted in a straightforward manner, we decided to include dummy variables for the macroeconomic conditions.

inflation > 5%),[17] (iv) low financial depth (0: M2/GDP < 0.5, 1: M2/GDP > 0.5),[18] and (v) low income (0: GDP/Capita < \$10,000, 1: GDP/Capita > \$10,000).[19] To test whether these five variables have an impact on how transparency influences the bias in money market expectations we also include interaction terms with the transparency index.

Van der Cruijsen et al. (2010) show that there might be a limit to the benefits of transparency and that an intermediate degree of transparency may be desirable.[20] The theoretical idea behind their finding is based on two aspects. First, central banks have to be clear about the conditionality of their policy steps and outcomes. Since the monetary policy environment is highly uncertain (e.g., economic shocks can and do occur), Issing (2005) argues that a good communication strategy would be to use clear wording when explaining complex facts and to avoid creating the illusion that the world is certain. According to this *uncertainty* argument (van der Cruijsen et al., 2010), the private sector does not have a solid basis for making *conditional* interest rate forecasts at low levels of transparency. More central bank transparency is likely to result in better insight into future interest rates and their conditionality and thus improve the quality of private forecasts. However, too much information on conditionality might lead to too much focus on this issue and reduce confidence in the quality of the forecasts. Second, too much transparency might lead to *confusion* of or *information overload* for private agents (van der Cruijsen et al., 2010). At low levels of transparency, additional information by the central bank (e.g., announcement of an explicit nominal anchor) might help the private sector improve the quality of its interest rate forecasts. However, at some point, additional information (e.g., provision of conditional interest rate forecasts based on several scenarios) is likely to result in confusion instead of clarity, with the end result being poorer quality interest rate forecasts by the private sector.[21] Therefore, it will be useful to discover whether there is an optimal amount of transparency. Consequently, we also add transparency^2 to Equation (4).

Finally, since the trend of increasing transparency stopped in 2003, we include a dummy variable D_t for the 2004–2009 subsample (0: 1998–2003, 1: 2004–2009) to test whether this break also affects transparency's influence on money market expectations.

[17] Median inflation in our sample is approximately 5 percent. Hong Kong is the only country that always belongs to the low inflation group, whereas Russia and Turkey belong to the high inflation group during the full sample period.
[18] Source: Money and quasi-money as percentage of GDP (World Bank).
[19] Source: Gross domestic product per capita based on purchasing power parity and current international dollar (IMF).
[20] Gosselin et al. (2007) provide a theoretical framework for this idea.
[21] Note that in the empirical analysis below we are not able to distinguish between these aspects.

Interaction terms with transparency and transparency^2 are then included to test whether the results are robust over these two subsamples.

3. Empirical Results

3.1 Baseline Results

Table 1 shows the results for the estimation of Equation (4).

Table 1: Explaining the Bias in Money Market Expectations

	(4)	
Inflation	0.102	**
IT	0.983	
… * Transparency	–0.051	
FX Peg	–0.800	**
… * Transparency	0.059	*
Low Inflation	0.387	
… * Transparency	–0.024	
Low Financial Depth	–0.216	
… * Transparency	0.035	
Low Income	1.822	**
… * Transparency	–0.194	**
Transparency	–0.841	**
Transparency^2	0.054	**
Dummy (2004 - 2009)	1.317	**
… * Transparency	–0.400	**
… * Transparency^2	0.023	**
R^2	0.481	
σ	6.942	

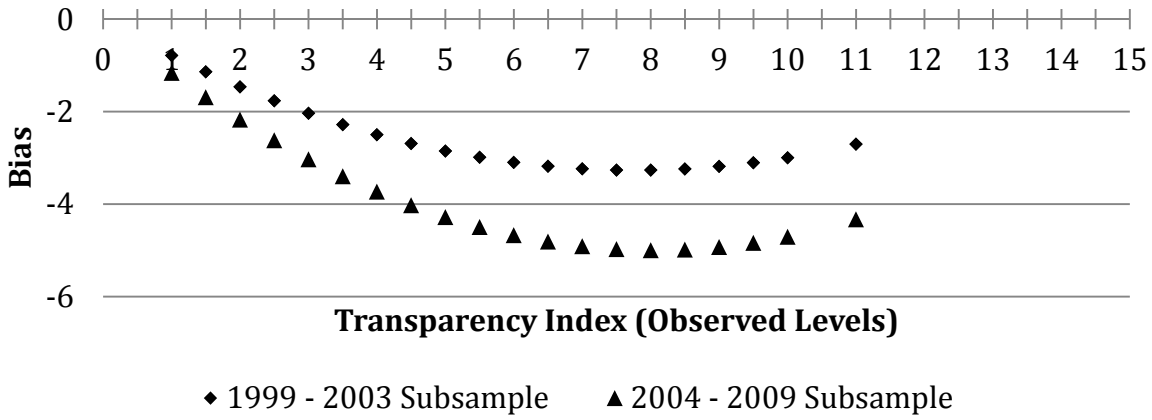
Note: Results for the estimation of Equation (4). **/* indicates significance at the 1%/5% level, respectively. Country fixed effects are included in the models. IT = Inflation Target; FX Peg = Pegged Exchange Rate; Low Inflation: Inflation < 5%; Low Financial Depth: M2/GDP < 0.5; Low Income: GDP per Capita < $10,000.

The results indicate that a 1 percentage point (pp) rise in inflation increases the bias in money market expectations by 0.1 pp. Countries with no pegged exchange rate have, on average, a 0.8 pp higher bias than countries with a peg. However, a one unit increase in the transparency index reduces the bias by 0.06 pp in the no-peg group. A higher degree of transparency is—at least to some extent—a substitute for an explicit exchange rate anchor. A similar result can be found for countries with a low per capita income (GDP per Capita < $10,000). These have on average a much higher bias (1.82 pp) than high per capita income countries. Nevertheless, this detrimental effect can be offset

by a higher degree of transparency. A one unit increase in the indicator reduces the bias by 0.19 pp.

Turning to the transparency index itself, we find—in line with our expectations—a negative relationship between the transparency index and the bias. A one unit increase in the transparency index reduces the bias by 0.84 pp over the full sample period. For the second subsample (2004–2009), we find an additional significant bias-reducing effect of 0.4 pp. Hence, the total effect in the second subsample is 1.24pp. However, this helpful effect is partly offset by the coefficient of transparency^2, which is 0.05 pp for the full sample period. Again, we find an additional effect for the second subsample of 0.02 pp and, thus, a joint effect of 0.08 pp for the period 2004–2009. Figure 5 illustrates the combined effect of transparency and transparency^2 for all levels of transparency observed in our sample while keeping all other variables constant.

Figure 5: Optimal Transparency



Note: This figure plots the effect of central bank transparency on the bias in money market expectations in both subsamples for observed transparency levels.

In line with the findings of van der Cruijsen et al. (2010), an intermediate level of transparency has the largest influence on money market expectations. Increases of transparency above the level of 7.5 appear to have an unfavorable effect on the bias in the first subsample, whereas central banks with a transparency index below 7.5 could benefit from increasing their transparency. The optimal level of transparency in the second subsample is only marginally different. During the period 2004–2009, an index of 8 is optimal. Hence, despite the slightly different coefficients for transparency and transparency^2 in both subsamples, we find a very similar optimal degree of transparency

for both. Thus, our results are qualitatively (and almost quantitatively) the same for both subsamples.

In general, transparency mitigates the bias in money market expectations. The effect is larger for countries with no exchange rate peg and countries with relatively low income. However, an intermediate level of transparency has the most favorable influence on money market expectations: neither complete secrecy nor complete transparency is optimal.

3.2 Results for Subcategories and Questions of the Transparency Index

Another novel aspect of this paper is our assessment of the influence of all subcategories and the corresponding questions of Eijffinger and Geraats's (2006) transparency index. For this purpose, we replace the overall transparency index with the five subcategories (political, economic, procedural, policy, operational) or questions. Table 2 sets out the results for all subcategories (left panel) and 14 of the 15 questions (right panel).[22]

All five subcategories have a theory-consistent declining impact on the bias. Political transparency—openness about policy objectives (e.g., a formal statement and prioritization of objectives or a quantification of the primary objective)—has the largest bias-reducing impact (–2.03 pp).[23] This finding is in accord with Neuenkirch's (2012) results for nine advanced economies. If a central bank has a clear and quantified mandate, for instance, an inflation target, it is easier for market participants to anticipate the bank's future monetary policy. All other subcategories are more or less equally important in their bias-reducing impact, which ranges from 0.96 pp to 1.39 pp.

Turning to the results for individual questions, we find a significant bias-reducing impact for 12 of the 14 items analyzed. Supporting the impression from the subcategories, it is the question gauging the degree of political transparency (Q1c) that has the largest influence on the bias of money market expectations (–7.71 pp). An explicit contract or a similar institutional arrangement between the monetary authorities and the government, for instance, granting the central bank independence, helps market participants better understand the central bank's intentions since monetary policy is not subject to government intervention.

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[22] We cannot use Q4c as there is no variation in the variable in our sample. Note that coefficients for the subcategories and items in Table 2 are larger than the one for overall transparency index in Table 1. However, since the coefficients for transparency^2 in Table 2 are also larger than they are in Table 1, conclusions regarding an optimal intermediate level of transparency remain unchanged.

[23] The effect is statistically larger than for economic ($Chi^2(1) = 10.5$**), procedural ($Chi^2(1) = 7.1$**), policy ($Chi^2(1) = 15$**), or operational ($Chi^2(1) = 10.1$**) transparency.

Table 2: Assessing the Subcategories and Questions of the Transparency Index

	(4a)		(4b)	
Political	–2.028	**	---	
Q1a	---		–2.546	**
Q1b	---		–2.904	**
Q1c	---		–7.711	**
Economic	–1.199	**	---	
Q2a	---		1.168	**
Q2b	---		–2.420	**
Q2c	---		–2.177	**
Procedural	–1.384	**	---	
Q3a	---		–2.321	**
Q3b	---		–2.530	**
Q3c	---		–2.474	**
Policy	–0.963	**	---	
Q4a	---		–0.469	
Q4b	---		–4.316	**
Operational	–1.156	**	---	
Q5a	---		–4.555	**
Q5b	---		–3.823	**
Q5c	---		–0.964	*
Transparency^2	0.067	**	0.123	**
R^2	0.473		0.499	
σ	6.965		6.936	

Note: Results for the estimation of Equation (4) after replacing the overall transparency index with its subcategories (left panel, 4a) and questions (right panel, 4b). An excerpt of the Eijffinger and Geraats (2006) questionnaire can be found in the Appendix. **/* indicates significance at the 1%/5% level, respectively. Country fixed effects are included in the models. The table omits the estimates for the other explanatory variables (available on request).

There are three other items that also stand out from rest: a regular evaluation of the extent to which a central bank's targets have been achieved (Q5a: –4.56 pp) and regular information on (unexpected) macroeconomic disturbances (Q5b: –3.82 pp) help market participants learn about (the central bank's view of) monetary policy mistakes and exogenous shocks and, therefore, agents can alter their expectations as to future interest rates if necessary. Finally, Geraats (2002) views policy transparency as having the potential to enhance the effectiveness of interest rate setting. Thus, it is not surprising that explanation of policy decisions significantly reduces the bias in money market expectations (Q4b: –4.32 pp). The latter finding is also in line with recent literature that measures the influence of (informal) central bank communication on financial market returns and volatility. Among many others, Egert and Kocenda (2013), Fiser and Horvath (2010), and Goyal and Arora (2012) show that central banks in

emerging markets[24] systematically use communication to influence financial market expectations.

4. Conclusions

In this paper, we study how central bank transparency influences the formation of money market expectations. Our survey covers 25 emerging market countries for the period January 1998–December 2009. As the dependent variable, we employ a variant of the bias indicator put forward in Neuenkirch (2012) that captures the deviation of money market rates from the expected target rate. Our findings are as follows.

First, transparency mitigates the bias in money market expectations. The effect is larger for countries with no exchange rate peg and countries with relatively low income. However, an intermediate level of transparency has the most favorable influence on money market expectations: neither complete secrecy nor complete transparency is optimal.

Second, a detailed examination of the subcategories of the Eijffinger and Geraats (2006) index reveals that all subcategories reduce bias in expectations, with political transparency having the largest effect. Of the individual question items, an explicit contract or a similar institutional arrangement between the monetary authorities and the government (Q1c) stands out, as do two subcategories of operational transparency (Q5a and Q5b) and the prompt disclosure of interest rate decisions (Q4b).

Our results have important implications for policymakers. First, the increase in political transparency (see Figure 3) paid off during the sample period. This category has the largest bias-reducing influence across all subcategories and, therefore, it might be beneficial for remaining 12 central banks—that is, the ones not receiving the maximum score in this subcategory—to increase this particular aspect of transparency. There is even more room for improvement when it comes to the other subcategories of the transparency index as, in case of operational transparency, only four (Q5a) and one (Q5b) central banks receive the maximum score. Second, since the prompt explanation of policy decisions, that is, formal central bank statements, also results in a strong bias-reducing impact, the use of informal communication could be another useful tool for steering money market expectations (for evidence in the context of nine advanced economies, see Neuenkirch, 2012). Finally, however, when deciding on improvements in transparency, central banks should take into account that too much transparency can be

[24] For a general overview of the literature on central bank communication, see Blinder et al. (2008).

harmful. Agents can become confused by the conditionality of central bank publications or simply suffer from an overload of information.

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Appendix

Transparency Index Questionnaire (Eijffinger and Geraats, 2006)

1. Political Transparency

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

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

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

2. Economic Transparency

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

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

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

3. Procedural Transparency

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

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

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

4. Policy Transparency

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

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

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

5. Operational Transparency

a) Does the central bank regularly evaluate to what extent its main policy operating targets (if any) have been achieved?

b) Does the central bank regularly provide information on (unanticipated) macroeconomic disturbances that affect the policy transmission process?

c) Does the central bank regularly provide an evaluation of the policy outcome in light of its macroeconomic objectives?