Effects of reputation and monetary policy communication on exchange rate uncertainty: evidence from an emerging market economy

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Abstract

This paper examines whether central bank reputation and communication attenuated exchange rate uncertainty in Colombia over 2007-21. Uncertainty is measured by means of disagreements and forecast errors of the dollar exchange rate. We construct a central bank reputation index, an index of the clarity of its policy meeting minutes, and a measure of central bank board dissent. We control for the Colombia – US interest rate differential, inflation expectations disagreement, economic policy uncertainty, and special oil industry factors. We estimate equations via GMM and assess robustness with ARDL and VAR models. The findings indicate that a stronger central bank reputation and clearer communication reduce exchange rate uncertainty. Unanimous monetary policy decisions reduce disagreements concerning expectations, while external shocks such as new fracking activities exacerbate volatility. These results underscore the importance of enhancing transparency and cohesion in monetary policy decisions to mitigate uncertainty in foreign exchange markets.

Keywords: exchange rate uncertainty, monetary policy, communication, emerging economy, reputation

1 INTRODUCTION

Uncertainty about the future behaviour of the exchange rate can have major implications for inflation, public debt management, and the real sector. In emerging market economies (EMEs), these channels are typically stronger than in advanced economies: exchange rate pass-through tends to be higher and faster, public and private balance sheets are more exposed to exchange rate volatility, foreign exchange markets are thinner, and external risk premia and terms of trade shocks amplify transmission of exchange rate fluctuations to economic activity and inflation.

The case of Colombia is interesting in this context for institutional reasons. Fiscal policy follows balanced budget rules, and monetary policy has followed inflation targeting since 2000. The Central Bank of Colombia has maintained a floating exchange rate regime since 1999, occasionally intervening and maintaining an adequate level of international reserves. The bank's board sets the policy rate and communicates its stance through press releases and minutes: when vote tallies are disclosed, that extra information can signal consensus or dissent within the board, shaping expectations and the sensitivity of the exchange rate to news. In this setup, institutional reputation and granularity of information on monetary policy decisions and votes can be a key driver of heterogeneity in exchange rate expectations, in addition to central bank FX interventions.

Despite a growing literature on how central bank communication and FX intervention reduce exchange rate uncertainty, little is known about how central bank reputation, interest rate decisions, and communication channels such as minutes shape exchange rate expectations in EMEs. We contribute to this gap on three fronts. First, we document the link between central bank reputation and disagreements and forecast errors in exchange rate expectations. Second, we assess the marginal role of minutes and vote disclosure, including unanimity, as signals that help coordinate exchange rate expectations. Third, we explore whether communication effects are stronger when uncertainty is high.

Our findings suggest that the central bank's reputation helps reduce disagreements and forecast errors in exchange rate expectations. In addition, minutes of central bank policy meetings serve as a communication channel that can reduce exchange rate uncertainty, especially when board decisions on policy rates are unanimous.

The remainder of the paper is organised as follows. Section 2 describes the data and methodology. Section 3 presents the results. Section 4 concludes.

2 METHODOLOGY

We derive exchange rate expectations from monthly surveys of economic analysts' expectations conducted by the Central Bank of Colombia.[1] This survey collects the expectations of a diverse group of financial market participants, including banks, brokerage firms, pension funds, insurance companies, international organisations and economic research centres. The survey is conducted monthly, with an average of 40 entities participating, via an electronic form available on the central bank's website.

Data collection takes place during the first week of each month. Participants provide their expectations for different time horizons, from the current month, to three, six, nine, twelve, and twenty-four months ahead, as well as the end of the following year. The main variables consulted in the survey include the representative exchange rate, total inflation and core inflation (excluding food), the policy rate, and GDP growth.

A key feature of the survey is that it is conducted before key events such as monetary policy meetings. This allows the survey to capture market expectations before the decisions that could significantly affect the economy, such as changes in interest rates or exchange rate policy.

Graph 1 charts the monthly path of the exchange rate, inflation, and the policy interest rate in Colombia from June 2007 to December 2021. The exchange rate was relatively stable at around 2,000 COP/USD between 2009 and 2014. With the rise of US oil shale output (fracking), the peso weakened markedly, reaching about COP 3,400 per USD in 2016. Pandemic-related uncertainty then pushed it past COP 3,500 per USD in 2020, and to roughly 4,000 in 2021.

Inflation and the policy rate have moved together: whenever inflationary pressures emerged, the central bank would raise interest rates until the pressures eased. This co-movement reflects the inflation targeting framework that the central bank has operated since 2000. The inflation target narrowed over time and in 2010 settled on a point target of 3%, with a tolerance range of +2 and -4 percentage points around the target.

[1] Monthly Survey of Economic Analysts' Expectations (EME) are available at: https://suameca.banrep.gov.co/estadisticas-economicas/encuestas.

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Throughout the period, inflation stayed below 10%. Three inflationary episodes stand out. The first, from 2007 to 2009, was driven by the commodity (mining and energy) boom and by strong aggregate demand, which pushed inflation above 7%. The second episode, in 2015, resulted from a combination of rapid peso depreciation and weather-related shocks, which boosted inflation to almost 9%. The expansionary fiscal and monetary policies after the onset of the Covid pandemic helped fuel a third bout of inflation in 2021.

Graph 1

Evolution of the exchange rate, inflation, and the policy rate in Colombia, 2007-2021

Source: Central Bank of Colombia.

Disagreements in expectations and forecast errors are often used in the literature as measures of dispersion in expectations of macroeconomic variables (Seelajaroen, Budsaratragoon and Jitmaneeroj, 2020; Galvis and Anzoátegui, 2019; Mankiw and Wolfers, 2003). We use disagreements and errors in exchange rate

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expectations of financial market participants as a measure of exchange rate uncertainty. Typically, disagreement is calculated using the interquartile range, which is less affected by abrupt changes in extreme sample values (Mankiw and Wolfers, 2003). However, the Central Bank of Colombia does not publish forecast information for each agent surveyed, making it impossible to calculate disagreement using this method. Instead, we calculate disagreements in exchange rate expectations as the difference between the highest (maximum) and lowest (minimum) values expected by survey participants, as proposed by Beckmann and Reitz (2020). Disagreements in exchange rates, Dis_Ex_t, are thus defined as:

$$Dis\_Ex_t = Ex\_rate_t^{Max} - Ex\_rate_t^{Min} \tag{1}$$

where $Ex\_rate_t^{Max}$ is the maximum and $Ex\_rate_t^{Min}$ is the minimum value of exchange rate expectations in the survey for a given month.

According with Beckmann and Czudaj (2017) and Bacchetta, Mertens and Van Wincoop (2009), forecast error can be calculated as a deviation of the expected from the observed exchange rate:

$$Error_t = Ex\_rate_t^{obs} - Ex\_rate_{t-n}^{\exp} \tag{2}$$

where $Ex\_rate_{t-n}^{\exp}$ refers to the average expectation of financial market participants.

A positive sign of the forecast error indicates that the exchange rate depreciated more than market participants had expected, i.e. they underestimated the exchange rate related risks in a given period. A negative sign of the forecast error indicates that the market participants overestimated the exchange rate-related risks in a given period.

Graph 2 depicts the evolution of disagreement in expectations and forecast errors for the COP/USD exchange rate between 2007 and 2021. Several phases can be identified, associated with salient economic events.

Between 2007 and 2013, disagreements in exchange rate expectations and forecast errors were relatively stable, except during the Global Financial Crisis of 2008-09. Between 2002 and 2014, the Colombian economy experienced a mining and energy boom. Foreign direct investment in the mining and energy sectors increased tenfold between 2002 and 2010, coal production increased by 80%, and oil production by 36%. Gold production increased by 340% between 2006 and 2010 (Sankey, 2020). This economic dynamic led to a significant improvement in Colombia's fiscal position, and in 2011 credit rating agencies assigned an investment grade rating to the country's sovereign debt.

From 2014 until 2017, a marked shift can be observed. Disagreement about exchange rate expectations increased significantly and forecast errors started to fluctuate widely.

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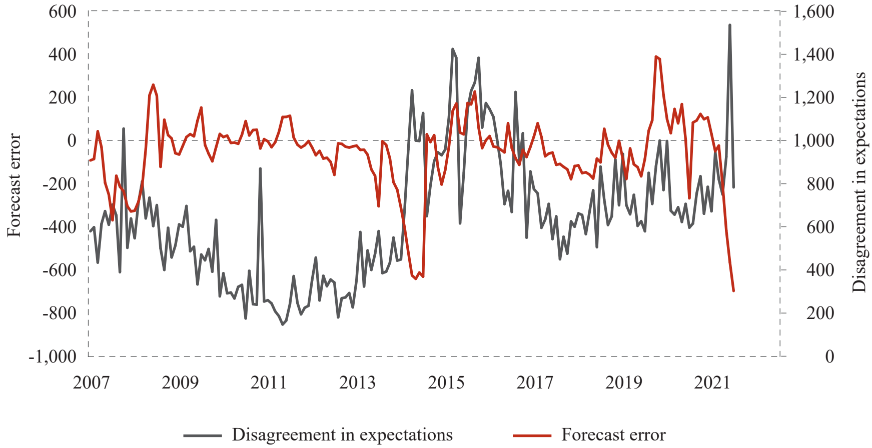
This pattern reflected the decline in international oil prices following the boom in hydraulic fracturing (fracking) in the United States, which materially affected economies with trade balances driven by oil and other energy commodity exports. In 2020-2021, high uncertainty associated with the Covid pandemic again amplified disagreements in exchange rate expectations and widened the fluctuations of forecast errors.

Graph 2

Disagreement in expectations and forecast errors for the COP/USD exchange rate



Sources: Central Bank of Colombia; authors' calculations.

2.1 CENTRAL BANK REPUTATION

Reputation in monetary policy is usually defined as a backward-looking measure indicating the ability to anchor inflation to the target (Anzoátegui et al., 2024). Inflation anchoring serves as a performance metric for monetary authorities, and it influences the formation of macroeconomic expectations among financial market participants (Seelajaroen, Budsaratragoon and Jitmaneeroj, 2020). Central banks that fulfil their commitment to anchor inflation reduce macroeconomic volatility and uncertainty. Reputation can thus be considered a necessary condition that enhances trust in future policies.

Based on the criteria outlined in the inflation targeting framework defined by the Central Bank of Colombia, Galvis and de Mendonça (2017) constructed a central bank reputation index ($REPU_t$) that captures deviations of inflation outcomes from the targets and ranges announced each year:

$$REPU_t = \begin{cases} 1 & \text{if} \quad INF_t = INF_t^* \\ 1 - \dfrac{1}{INF_t^{Bound} - INF_t^*}\left[INF_t - INF_t^*\right] & \text{if} \quad INF_t^{LB} < INF_t < INF_t^{UB} \\ 0 & \text{if } INF_t \geq INF_t^{UB} \text{ o } INF_t \leq INF_t^{LB} \end{cases} \tag{3}$$

Deviations are normalised within a range of 0 to 1, so the reputation index is equal to 1 when the twelve-month accumulated inflation (INF_t) matches the target (INF_t^*). The index takes values between 0 and 1 when inflation lies within the target range but is above or below the inflation target. Reputation equals zero when inflation exceeds the upper bound (INF_t^{UB}), or falls below the lower bound (INF_t^{LB}).

The challenge the central bank faces in building its reputation consists of stabilising prices around the inflation target and its ranges. Longer lasting and larger deviations normally lead to interest rate adjustments, which may result in capital flows that in turn affect the exchange rate. Foreign exchange market participants take account of these relationships when forming their exchange rate expectations, so it is important to consider central bank reputation as a distinct determinant of exchange rate uncertainty.

2.2 COMMUNICATION AND DISAGREEMENTS AMONG POLICYMAKERS

The effectiveness of monetary policy depends not only on the use of instruments such as interest rates but also on the management of expectations. Central bank communication can shape inflation expectations and is therefore very important in an inflation-targeting framework. To guide these expectations, it uses various communication tools in its efforts to achieve transparency.

In the case of the Central Bank of Colombia, press releases, meeting minutes, monetary policy reports, and accountability reports to Congress have become the main monetary policy communication tools (Anzoátegui and Galvis, 2019). Empirical evidence suggests that market participants pay most attention to minutes of monetary policy meetings (Anzoátegui, Rodríguez and Galvis, 2024; Guío et al., 2020). This tool has been used since late 2007 to provide detailed information about decisions on policy interest rates, and to explain the direction of monetary policy and policymakers' perspectives on the economic situation. Since the minutes report inflation outcomes, deviations from the target, projections, and the rationale behind monetary policy decisions, their clarity can serve as a useful measure to assess the influence of monetary policy communication on exchange rate uncertainty.

Clarity in monetary policy statements can be measured using various indicators of readability. These indicators help analyse the quality of writing in terms of text length, logical sentence order, and text structures that facilitate proper comprehension (Ferrando-Belart, 2004). We use the Inflesz readability indicator, specifically designed to measure the legibility and understanding of Spanish language texts by Barrio-Cantalejo et al. (2008) to construct the following readability index for the Central Bank of Colombia policy meeting minutes:[2]

$$Inflesz_t = 206{,}835 - \frac{62.3S}{P} - \frac{P}{F} \quad (4)$$

[2] The minutes were analysed using: https://legible.es/.

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where S is the total number of syllables in the minutes, P is the total number of words, and F is the total number of sentences. The intuition behind this indicator is that many syllables per word and many words per sentence reduce readability. If someone must process a text with long words or sentences, it will be harder to grasp the message, requiring a higher level of education. The readability of meeting minutes can thus improve if they are designed with shorter words and sentences.

According to the scale proposed by Barrio-Cantalejo et al. (2008), the index can be divided into five categories (table 1).

Table 1

Inflesz perspicuity scale

Numeric scale	Interpretation	Education required to interpret the text and type of publication
>80	Very easy	Primary education – comics, graphic novels
65-80	Quite easy	Primary education – press, bestselling novels
55-65	Normal	Primary education – general press, sports press
40-55	Little difficult	High school education – scientific dissemination, specialised press
0-40	Very difficult	University education – scientific text

Source: Barrio-Cantalejo et al. (2008).

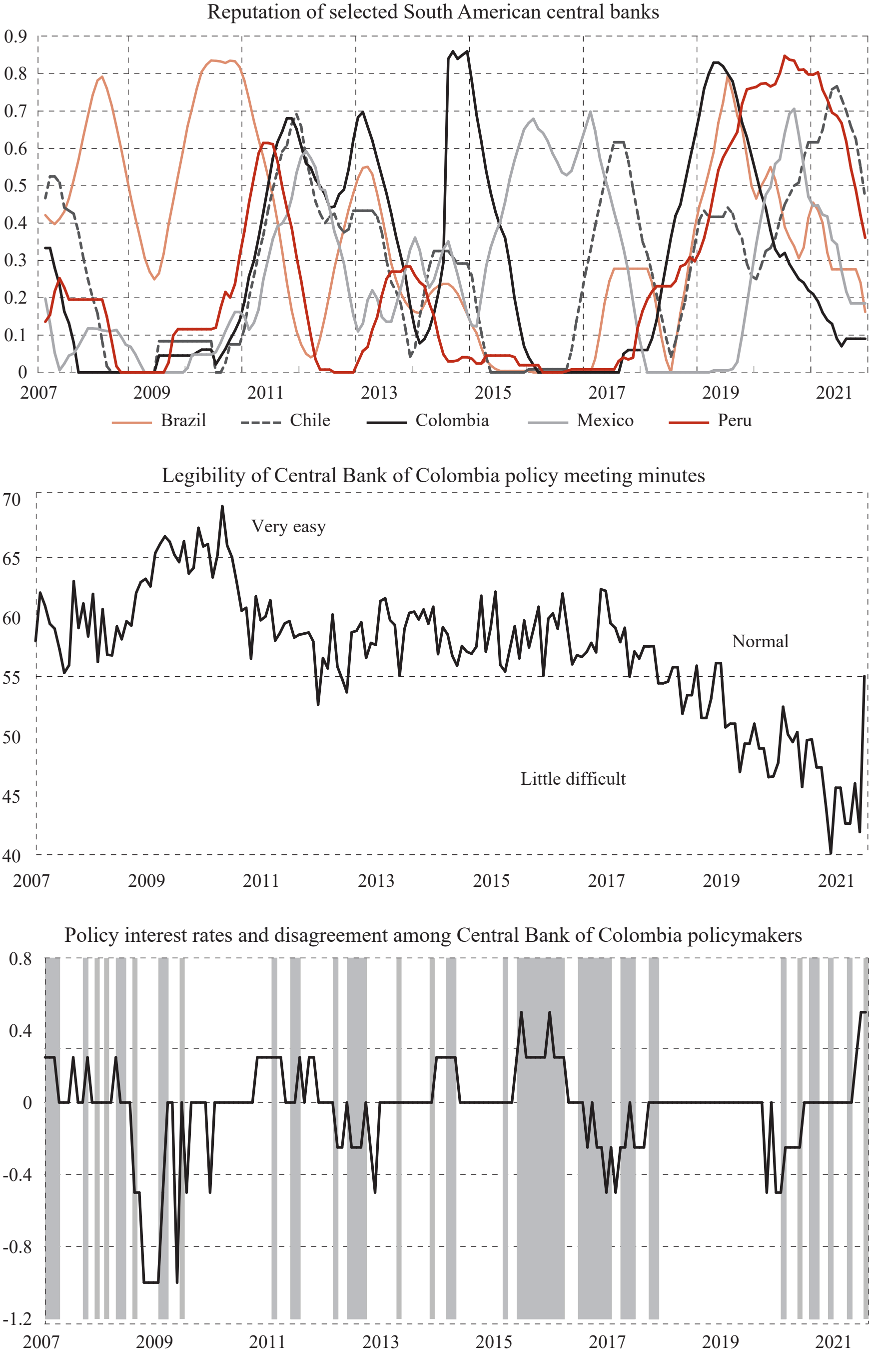
We use this scale to operationalise the clarity of the central bank's policy meeting minutes: higher scores reflect shorter words and sentences and thus greater accessibility, while very low scores reflect longer words and sentences and thus greater demands on reading comprehension.

Beyond assessing the readability of the minutes, it is important to identify the effects of disagreement among those responsible for monetary policy. According to Crump, Eusepi and Moench (2013), differences in policymakers' positions tend to intensify in an environment of higher inflation, unemployment, and greater output volatility. Anzoátegui and Galvis (2022) argue that these differences serve financial market participants as signals (or noise) in the formation of macroeconomic expectations. To capture the effects of disagreement among policymakers on exchange rate uncertainty, we use a dummy variable (Dis_Junta_t) that takes a value of 1 when monetary policy decisions are made by majority vote, and 0 when decisions are unanimous.

Graph 3 shows the index of reputation for several South American central banks, and indicators of clarity of communication and disagreement among monetary policymakers for the Central Bank of Colombia over the 2007-21 period. The top panel suggests that South American central banks find it difficult to maintain a high level of reputation. The index that describes the degree of inflation anchoring fluctuates widely between zero (inflation outside the target ranges) and at most 0.85 (inflation close to target), the latter over short periods only. In the case of Colombia, the reputation index increased only to fall sharply four times over this period.

Graph 3

Indicators of central bank reputation, clarity of communication and disagreement among monetary policymakers



Note: Shaded areas in the bottom panel indicate periods when interest rate decisions were taken by majority vote; blank areas periods when they were taken unanimously.

Sources: Central Bank of Colombia; authors' calculations.

The panel in the middle shows that the policy meeting minutes issued by the Central Bank of Colombia were comprehensible to a broad audience until mid-2018, but afterwards the clarity of its communication worsened. The likely reason is that in July 2019 the section on macroeconomic context was removed from the minutes, while the remaining sections on policy discussion and options and the policy decision contained fewer words and paragraphs but with a more technical language.

The bottom panel traces changes in the policy interest rate and disagreement on the policy decision among the central bank policymakers. The latter was rescaled from a 0-1 scale to the scale of policy rate changes (with zero indicating no change) so that both series can share a single axis. The grey shading marks meetings with majority decisions; white areas indicate periods when policy decisions were taken with unanimity.

2.3 ESTIMATING FRAMEWORK AND CONTROL VARIABLES

We use two equations to evaluate the effects of central bank reputation and communication on exchange rate expectations and forecast errors in the financial market:

$$\begin{aligned} Dis\_Ex_t &= \beta_1 + \beta_2 Dis\_Ex_{t-1} + \beta_3 \Delta REPU_t + \beta_4 \Delta Inflesz_t \\ &+ \beta_5 Dis\_Junta_t + \sum_{i=1}^{4} \beta_6 X_{it-1} + \varepsilon_t^1 \end{aligned} \tag{5}$$

$$\begin{aligned} Error_t &= \beta_7 + \beta_8 Error_{t-1} + \beta_9 \Delta REPU_t + \beta_{10} \Delta Inflesz_t \\ &+ \beta_{11} Dis\_Junta_t + \sum_{i=1}^{4} \beta_{12} X_{it-1} + \varepsilon_t^2 \end{aligned} \tag{6}$$

The first dependent variable, Dis_Ex_t, represents disagreement in exchange rate expectations, while Dis_Ex_{t-1} is its lag that captures the inertia of expectations. The second dependent variable, $Error_t$, captures forecast errors, with $Error_{t-1}$ representing its lag, which captures the persistence of errors.

In addition to indicators of central bank reputation, the clarity of its policy meeting minutes, and disagreement among policymakers, we include a vector of four control variables that may also influence exchange rate expectations in financial markets: interest rate differentials (Dif_i_t), inflation uncertainty ($dis\_inf_t^e$), technology shocks ($Frack_t$), and economic policy uncertainty (EPU_t).

Expectations of increases in domestic policy rate (or an actual increase therein) relative to the foreign policy rate normally lead to exchange rate appreciation. There is thus a direct (though not necessarily causal) relationship between policy rate differentials and exchange rate expectations: a widening of the differential in principle reduces the dispersion of exchange rate expectations and forecast errors in FX markets. The interest rate differential is calculated as the difference between the policy interest rates of the Central Bank of Colombia and the Federal Reserve.

Inflation uncertainty is another macroeconomic variable that affects exchange rate expectations and their forecast errors. According to Beckmann and Czudaj (2017), disagreements in inflation expectations reflect uncertainty of financial market participants about the central bank's ability to anchor inflation expectations to target. Greater disagreements indicate that market participants are more uncertain about the future economic environment for domestic prices. To measure inflation uncertainty, we calculate the difference between maximum and minimum twelve-month inflation expectations in central bank monthly surveys of financial analysts.

The implementation of oil extraction technologies associated with hydraulic fracturing (fracking) led to a rapid and unexpected decline in oil prices between 2014 and 2016. According to Toro et al. (2015) and Melo-Becerra et al. (2016), the collapse of oil prices affected numerous macroeconomic variables, including terms of trade, national income, investment, the external and fiscal balance, and foreign capital inflows. These effects culminated in a sharp peso depreciation that influenced exchange rate uncertainty. Understanding the effects of fracking on exchange rate uncertainty is an important element of empirical analysis. We use a dummy variable for fracking that equals to 1 from July 2014 to February 2016 and zero for all other periods.

We also include an economic policy uncertainty based on Baker, Bloom and Davis (2016). Rúa and Marín-Rodríguez (2024), Abid (2020) and Arouri et al. (2016) found that economic policy uncertainty affected movements and volatility of the exchange rate in EMEs, and had direct effects on investor confidence and capital flows and hence on the exchange rate.

3 ESTIMATIONS AND RESULTS

To avoid spurious regressions, we first checked that the time series are stationary. The results of various unit root tests are shown in table A2. We examined unit root properties using the breakpoint unit root test (Perron, 1997), specifying a break at the intercept. For disagreements in exchange rate expectations (Dis_Ex_t), the estimated breakpoint date was November 2014 (test statistic -4.96, 5% critical value -5.64), leading to the rejection of the unit root null hypothesis. For exchange rate forecast errors ($Error_t$), the estimated breakpoint date was November 2014 (test statistic -4.62, 5% critical value -4.44). These findings suggest stationarity around a shifted mean, which is consistent with structural effects due to fracking, allowing us to use these variables in levels (table A3).

All explanatory variables were stationary in their original form. We further used Breusch-Godfrey and Breusch-Pagan-Godfrey tests to assess serial correlation and heteroskedasticity for the ARDL-HAC model in equations (5) and (6). The results suggested no serial correlation in either regression, and heteroskedasticity only in equation 6 (table A4).

We used the Generalised Method of Moments (GMM) to estimate the regressions, using a Newey-West heteroskedasticity and autocorrelation consistent (HAC) covariance matrix to address heteroskedasticity detected in equation (6).

Applying a Newey-West robust covariance matrix (HAC) to address heteroskedasticity detected in equation (6).

We considered overidentification restrictions in selecting instrumental variables for an efficient GMM estimator using a standard Hansen J test. Following the methodological approach proposed by Johnston (1984), we selected instruments based on data from prior periods to ensure their exogeneity. In addition, we estimated the two-step GMM with corrections to address small-sample downward biases on standard errors.

The estimation results are reported in tables 2 and 3. The basic model evaluates the effect of monetary policy reputation and communication on exchange rate expectations and exchange rate forecast errors. The extended model includes a time variable. We used the standard deviation to normalise the measurement of variables.[3]

The estimated coefficient on the lag of disagreements in exchange rate expectations (Dis_Ex_{t-1}) is positive and significant at the 1% level in all models, suggesting the presence of rigidities in the formation of exchange rate expectations. According to Beckmann and Reitz (2020), agents update information slowly, prolonging uncertainty in the FX market. Coibion and Gorodnichenko (2015) and Mankiw and Reis (2002) argued that the persistence of lags was associated with differences in access to and processing of information, and noisy updating of information sets.

Parameter estimates associated with reputation ($REPU_t$) are negative and significant in all models, indicating that monetary policy reputation could reduce disagreements in exchange rate expectations and their forecast errors. Carrière-Swallow et al. (2021) similarly provided evidence that monetary policy frameworks that controlled inflation generally reduced exchange rate volatility and exchange rate pass-through to consumer prices.

Parameter estimates associated with monetary policy communication indicate that policy meeting minutes and voting records are an effective tool for guiding exchange rate expectations. The estimated coefficient on the clarity of minutes ($\Delta Inflesz_t$) is negative and significant across all models, suggesting that greater efforts to enhance the readability of minutes have the potential to reduce exchange rate uncertainty. This result is in line with findings of Bacchetta, Mertens and Van Wincoop (2009), who argued that heterogeneity in exchange rate expectations occurred as a consequence of information rigidities.

Coefficient estimates on disagreement among monetary policymakers (Dis_Junta_t) are positive and significant in most models. This suggests that interest rate decisions made by majority vote lead to more dispersed exchange rate expectations and greater exchange rate forecast errors, thereby heightening the uncertainty in FX markets. Anzoátegui and Galvis (2022), Tsang and Yang (2025), and Blot, Hubert and Labondance (2025) obtained similar results.

[3] The data were normalised using Z standardisation, which is defined as: $Z = \frac{X - \mu}{\sigma}$.

Table 2

Effects of monetary policy reputation and communication on disagreements of the exchange rate

Dep. variable Dis_Ex_t	**GMM-HAC estimates**						**GMM-Windmeijer estimates**					
Regressors	**(Eq 5.1)**	**(Eq 5.2)**	**(Eq 5.3)**	**(Eq 5.4)**	**(Eq 5.4)**	**(Eq 5.5)**	**(Eq 5.1)**	**(Eq 5.2)**	**(Eq 5.3)**	**(Eq 5.4)**	**(Eq 5.4)**	**(Eq 5.5)**
C	-0.02 (-0.57)	-0.11 (-1.58)	-0.19** (-2.09)	-0.19** (-1.97)	-0.17 (-2.35)	0.21** (-2.35)	-0.02 (-0.51)	-0.11* (-1.83)	-0.19** (-2.27)	-0.19* (-1.89)	-0.17 (-1.40)	-0.23** (-2.03)
Dis_Ex_{t-1}	0.76*** (12.96)	0.75*** (13.65)	0.71*** (9.97)	0.66*** (11.14)	0.58*** (6.64)	0.51*** (7.49)	0.76*** (9.65)	0.75*** (11.65)	0.71*** (8.46)	0.66*** (10.44)	0.58*** (5.78)	0.48*** (4.61)
$\Delta REPU_t$	-0.22** (-2.90)	-0.35*** (-3.67)	-0.39*** (-2.91)	-0.33*** (-2.63)	-0.47** (-2.09)	-0.419* (-1.81)	-0.22** (-2.20)	-0.35*** (-4.13)	-0.39*** (-2.62)	-0.33** (-2.28)	-0.47** (-2.45)	-0.46* (-1.85)
$\Delta Inflesz_t$	-0.08** (-2.07)	-0.072* (-1.68)	-0.09* (-1.89)	-0.12** (-2.04)	-0.15*** (-2.80)	-0.10** (-1.99)	-0.08** (-2.04)	-0.07* (-1.65)	0.083* (-1.74)	-0.11** (-1.98)	-0.15*** (-2.83)	-0.09* (-1.68)
Dis_Junta_t		0.27* (1.80)	0.41** (2.22)	0.42*** (2.18)	0.40* (1.67)	0.45** (2.60)		0.28** (1.99)	0.41** (2.29)	0.42** (2.14)	0.40* (1.65)	0.48** (2.36)
$Frack_t$			0.40*** (3.53)	-0.34*** (3.80)	0.28** (1.99)	-0.36*** (3.26)			0.40*** (2.89)	0.34*** (3.64)	0.27** (2.21)	0.38** (2.52)
$dis\_inf_t^e$				0.11** (2.03)	0.28*** (2.97)	0.25*** (3.38)				0.11** (2.07)	0.28*** (2.86)	0.25** (2.31)
Dif_i_t					-0.13** (-2.11)	-0.14* (-2.61)					-0.13** (-2.11)	-0.14** (-2.12)
EPU_t						0.17** (2.34)						0.18** (1.85)
R2adj	0.68	0.67	0.66	0.68	0.62	0.62	0.65	0.68	0.66	0.68	0.62	0.61
J-stat	2.52	1.63	1.76	0.58	1.77	8.37	2.50	1.60	1.90	0.55	1.73	7.93
P(J-stat)	0.92	0.99	0.94	0.99	0.77	0.81	0.92	0.99	0.92	0.99	0.70	0.84
No. of inst.	11	13	12	13	12	22	11	13	12	13	12	22

**** Denotes significance at 1%, ** at 5%, and * at 10% level. t-statistics in brackets. P(J-stat) is the p-value of the J-test for over-identification.*

TABLE 3

Effects of monetary policy reputation and communication on forecast errors of the exchange rate

Dep. variable $Error_t$	GMM-HAC estimates						GMM-Windmeijer estimates					
Regressors	**(Eq 5.1)**	**(Eq 5.2)**	**(Eq 5.3)**	**(Eq 5.4)**	**(Eq 5.4)**	**(Eq 5.5)**	**(Eq 5.1)**	**(Eq 5.2)**	**(Eq 5.3)**	**(Eq 5.4)**	**(Eq 5.4)**	**(Eq 5.5)**
C	0.01 (0.37)	0.008 (0.19)	0.01 (0.23)	0.01 (0.33)	0.03 (0.74)	-0.16* (-1.75)	0.01 (0.37)	0.008* (0.18)	0.01 (0.20)	0.01 (0.28)	0.03 (0.67)	-0.16 (-1.52)
Dis_Ex_{t-1}	0.76*** (9.33)	0.73*** (10.41)	0.79*** (9.38)	0.79*** (11.55)	0.72*** (11.05)	0.71*** (11.69)	0.76*** (8.71)	0.73*** (8.94)	0.79*** (7.47)	0.79*** (8.25)	0.72*** (8.71)	0.69*** (5.47)
$\Delta REPU_t$	-0.12*** (-3.50)	-0.14*** (-3.94)	-0.10*** (-3.28)	-0.12*** (-4.00)	-0.14*** (-4.37)	-0.11*** (-3.55)	-0.12*** (-3.37)	-0.14*** (-3.65)	-0.10*** (-2.74)	-0.12*** (-3.35)	-0.14*** (-4.05)	-0.13*** (-3.38)
$\Delta Inflesz_t$	-0.22* (-1.95)	-0.46** (-2.23)	-0.18** (-2.13)	-0.18** (-2.18)	-0.21** (-2.32)	-0.41*** (-3.18)	-0.22* (-1.81)	-0.46** (-2.10)	-0.18* (-1.73)	-0.18* (-1.70)	-0.21* (-1.91)	-0.32* (-1.66)
Dis_Junta_t		0.16** (2.05)	0.18*** (2.70)	0.16** (2.20)	0.21*** (2.63)	0.13** (1.98)		0.16** (2.02)	0.18** (2.27)	0.16* (1.87)	0.21** (2.42)	0.19* (1.91)
$Frack_t$			-0.16 (-1.02)	-0.11 (-0.94)	-0.18 (-1.53)	-0.17 (-1.62)			-0.16 (-0.73)	-0.11 (-0.71)	-0.18 (-1.32)	-0.30 (-1.50)
$dis\_inf_t^e$				0.07* (1.76)	0.13** (2.48)	0.13* (1.86)				0.07 (1.20)	0.13** (2.02)	0.16** (2.50)
Dif_i_t					-0.10* (-1.95)	-0.06 (-1.32)					-0.10* (-1.67)	-0.08 (-1.36)
EPU_t						0.001** (2.02)						0.001* (1.70)
R2adj	0.65	0.64	0.65	0.67	0.67	0.67	0.65	0.64	0.65	0.67	0.67	0.67
J-stat	1.69	1.12	5.60	5.06	3.54	7.87	1.69	1.12	5.60	5.06	3.54	9.86
P(J-stat)	0.42	0.88	0.23	0.65	0.61	0.85	0.42	0.88	0.23	0.65	0.61	0.70
No. of inst.	6	9	10	14	13	22	6	9	10	14	13	22

**** Denotes significance at 1%, ** at 5%, and * at 10% level. t-statistics in brackets. P(J-stat) is the p-value of the J-test for over-identification.*

The dummy variable for the period when the use of fracking technology in the United States surged is positive and statistically significant in all models. This result confirms that the sharp decline in crude oil prices driven by an oversupply led to significant exchange rate and movements and increased exchange rate uncertainty. Toro et al. (2015) and Melo-Becerra (2016) similarly found that the collapse in oil prices disrupted the dynamics of capital flows and terms of trade, leading to faster depreciation and greater instability in the Colombian foreign exchange market.

The estimated parameters on discrepancies in inflation expectations ($dis\_inf_t^e$) are positive and statistically significant in almost all regressions. This suggests that greater disagreement in inflation forecasts is associated with greater disagreement in exchange rate forecasts. Similar results were found by Beckmann and Reitz (2020).

Parameter estimates for the interest rate differential (Dif_i_t) are negative and statistically significant in most specifications, suggesting that an increase in the domestic relative to the foreign policy rate (i.e. a wider differential, given that policy rates in Colombia were most of the time higher than in the United States) reduces disagreements about future exchange rates and exchange rate forecast errors. This evidence is consistent with Dick, MacDonald and Menkhoff (2015).

The estimated parameter associated with the economic policy uncertainty index is positive and statistically significant in all models. This indicates that greater uncertainty about economic policies, derived from newspaper articles about Colombia's economy, also increases the dispersion of exchange rate expectations and exchange rates forecast errors among FX market participants.

4 ROBUSTNESS ANALYSIS

4.1 ARDL ESTIMATES

As the first robustness check we re-estimated the models using the autoregressive distributed-lag (ARDL) approach proposed by Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001). Under the assumption of having a group of time series variables, some in I(0) and others in I(1), but none equal to or greater than I(2), this method is useful for small samples. Pesaran, Shin and Smith (2001) note that the ARDL model provides a simple univariate framework for testing the existence of a single-level relationship between y_t and x_t when it is not known with certainty whether the regressors are purely I(0), purely I(1), or mutually cointegrated.

We estimate the following error correction models:

$$\begin{aligned} Dis\_Ex_t = {} & \alpha_0 + \sum_{i=1}^{p}\varphi_i Dis\_Ex_{t-i} + \sum_{i=1}^{p}\theta_i \Delta REPU_{t-i} + \sum_{i=1}^{p}\eta_i \Delta Inflesz_{t-i} + \sum_{i=1}^{p}\gamma_i Dis_{Junta_{t-i}} \\ & + \sum_{i=1}^{p}\omega_i dis\_inf^e_{t-1} + \sum_{i=1}^{p}\psi_i Dif_{i_{t-i}} + \sum_{i=1}^{p}\Omega_i EPU_{t-i} + \delta_1 Dis\_Ex_{t-1} + \delta_2 REPU_{t-1} \\ & + \delta_3 Inflesz_{t-1} + \delta_4 Dis_{Junta_{t-1}} + \delta_5 dis\_inf^e_{t-1} + \delta_6 Dif_{i_{t-1}} + \delta_7 EPU_{i_{t-1}} + \xi_t \end{aligned} \quad (7)$$

$$Error_t = \alpha_0 + \sum_{i=1}^{p}\varphi_i Error_{t-i} + \sum_{i=1}^{p}\theta_i \Delta REPU_{t-i} + \sum_{i=1}^{p}\eta_i \Delta Inflesz_{t-i} + \sum_{i=1}^{p}\gamma_i Dis_{Junta_{t-i}}$$
$$+ \sum_{i=1}^{p}\omega_i\, dis\_inf^e_{t-1} + \sum_{i=1}^{p}\psi_i Dif_{it-i} + \sum_{i=1}^{p}\Omega_i EPU_{t-i} + \delta_1 Error_{t-1} + \delta_2 REPU_{t-1} \quad (8)$$
$$+ \delta_3 Inflesz_{t-1} + \delta_4 Dis_{Junta_{t-1}} + \delta_5\, dis\_inf^e_{t-1} + \delta_6 Dif_{i_{t-1}} + \delta_7 EPU_{i_{t-1}} + \xi_t$$

where p is the optimal lag length. The second part of the right-hand side of both equations with parameters δ_i represents the levels relationship. To determine the lag orders for the variables in each equation, we select a model that optimises the adjusted R-squared. We check the existence of relationships in levels through an F-test for each equation. When a level relationship exists, the F-test indicates which variable should be normalised. The null hypothesis for the nonexistence of the relationship in level among variables in both equations is that all δ_i coefficients are equal to zero, and the alternative is that they are all different from zero. According to Pesaran, Shin and Smith (2001), the F-test provides critical values for the lower bound for the cases where all regressors are I(0), and for the upper bound when all regressors are I(1). When the test statistic is below the lower bound, we cannot reject the null hypothesis and conclude that cointegration is not present. When the test statistic is above the upper bound, we can reject the null hypothesis and conclude that cointegration is possible. In that case, we proceed with a t-test of significance of the error correction parameter δ.

The F-test statistics reported in tables 4 and 5 exceed the respective upper critical values, so the null hypothesis can be rejected for both equations. The coefficient on the lagged error correction term is significant at the 1% level with the expected negative sign, confirming the result of the bounds test for cointegration.

Table 4

ARDL – Level relationships obtained from Equation (5) – Dis_Ex_t

Dis_Ex_t – ARDL(1, 0, 0, 0, 0)

Bounds test			**Critical value bounds**
Test statistic	**Value**	**Significance**	I(1) bound
F-statistic	7.86	1%	4.99
K	7		
Long run coefficients			
Variables	**Coefficient**	**Std. error**	**t-statistic**
$REPU_t$	-0.20*	(0.12)	-1.68
$Inflesz_t$	-0.24*	(0.13)	-1.82
Dis_Junta_t	0.42*	(0.22)	1.86
$dis\_inf^e_t$	0.27*	(0.14)	1.92
Dif_i_t	-0.10	(0.12)	-0.79
EPU_t	0.31***	(0.11)	2.75

**** Denotes 0.01, ** 0.05, and * 0.10 level of significance.*

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Table 5

ARDL – Level relationships obtained from Equation (6) – $Error_t$

$Error_t$ – ARDL(1, 0, 0, 1, 0)			
Bounds test			**Critical value bounds**
Test statistic	**Value**	**Significance**	I(1) bound
F-statistic	5.07	1%	3.99
K	7		
Long run coefficients			
Variables	**Coefficient**	**Std. error**	**t-statistic**
$REPU_t$	-0.49**	(0.20)	-2.43
$Inflesz_t$	-0.79*	(0.43)	-1.84
Dis_Junta_t	0.78**	(0.38)	2.02
$dis\_inf_t^e$	0.39*	(0.20)	1.89
Dif_i_t	-1.85	(0.98)	-1.88
EPU_t	0.37**	(0.18)	2.00

**** Denotes 0.01, ** 0.05, and * 0.10 level of significance.*

Relative to the results reported in tables 2 and 3, coefficient estimates reported in tables 4 and 5 show no change in coefficient signs. Solid central bank reputation, clear communication, and unanimous policy decisions reduce exchange rate uncertainty, while greater dispersion of inflation expectations and greater economic policy uncertainty increase it. Only the coefficient estimates on the interest rate differential are not statistically significant in these specifications.

4.2 VAR ESTIMATES AND IMPULSE-RESPONSE ANALYSIS

For the second robustness check we used a vector autoregressive (VAR) model and analysed impulse response functions.[4] We used a generalised impulse response function to eliminate the problem of variable ordering. This approach resolves potential issues with contemporaneous correlation among variables and is suitable for analysis without distinguishing between dependent and independent variables. We estimated the VAR and analysed impulse response for the two dependent and eight explanatory variables estimated with GMM. The lag order was set to one, based on the Hannan-Quinn (HQ) information criterion, which is suitable for small samples. The roots of the VAR satisfied the stability condition.

As in GMM estimations, estimated coefficients for the lag of dependent variables were positive and significant, indicating a strong persistence of uncertainty about the exchange rate. Estimated coefficients for the reputation variable were negative and statistically significant. Improved reputation and greater clarity of policy meeting minutes reduced disagreements about future exchange rates and forecast errors for up to one year. The estimated coefficients on disagreement among monetary policymakers was positive and significant: policy decisions made by majority vote increased the dispersion of exchange rate expectations for three months, and exchange rate forecast errors for twelve months.

[4] The results are available from the authors upon request.

Regarding control variables, the effects of the fracking dummy were positive and statistically significant in both VARs. The sharp decline in oil prices led to a persistent increase in exchange rate expectations and forecast errors over a one-year period. Likewise, the coefficients on differences in inflation forecasts were positive and statistically significant in both specifications, with a one-year impact on dependent variables after a shock. For interest rate differential, negative effects were estimated in both models but were not statistically significant in the regression on exchange rate expectations. Shocks in economic policy uncertainty had a positive and significant effect on both dependent variables over a period of at least one year.

5 CONCLUSIONS

This paper explored the impact of the reputation and communication skills of the Central Bank of Colombia on disagreement in exchange rate expectations and exchange rate forecast errors by FX market participants in Colombia.

The results suggest that reputation plays a crucial role in anchoring exchange rate expectations. Strong reputation, built on consistently meeting inflation targets, significantly reduces uncertainty in the foreign exchange market. Clear and consistent monetary policy communication is another important avenue for reducing disagreements in exchange rate expectations and forecast errors. Clear and accessible language is correlated with less dispersion in exchange rate expectations and greater forecasting accuracy. This underscores the importance of not just disseminating information but doing so in a manner that enables market participants and other economic agents to align their expectations with monetary policy goals. Separately, disagreement among monetary policymakers also influences exchange rate uncertainty: greater cohesion of their votes shapes exchange rate expectations in an important way.

Exogenous factors such as the impact of fracking also have a significant effect on the volatility of exchange rate expectations. Such events increase disagreements in expectations and exchange rate forecast errors, highlighting their sensitivity to external shocks. This finding highlights the need for the central bank to maintain proactive and effective communication in periods of high uncertainty in order to mitigate the destabilising effects of such events.

The findings in this study suggest that in emerging economies with developing financial markets, a central bank that is committed to anchoring inflation to its target, invests in clear, high-effort communication and acts cohesively in policy rate decisions can help foster stability in domestic foreign exchange markets. Any persistence and sluggish adjustment of disagreement in exchange rate expectations and forecast errors point to natural frictions in the processing of information.

Disclosure statement

The authors have no conflict of interest to declare.

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APPENDIX

TABLE A1
Descriptive statistics and correlations among variables

Variables	Mean	Min.	Max.	Std. dev.	Kur	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) $Error_t$	-58.71	-697.40	389.51	171.88	6.02	1								
(2) Dis_Ex_t	2,538.71	1,778.80	3,759.21	636.21	1.65	0.14*	1							
(3) $REPU_t$	0.28	0.00	0.87	0.27	2.05	-0.19**	-0.14*	1						
(4) $Inflesz_t$	57.03	40.03	69.33	5.67	3.68	-0.00	-0.70***	-0.21***	1					
(5) Dis_Junta_t	0.41	0.00	1.00	0.49	1.13	0.05	0.11	-0.23***	0.01	1				
(6) $Frack_t$	0.10	0.00	1.00	0.31	7.84	-0.30***	-0.05	0.29***	0.06	0.02	1			
(7) $dis\_inf^e_t$	4.47	1.80	9.09	1.71	3.39	-0.07	-0.41***	-0.38***	0.40***	0.23***	0.06	1		
(8) Dif_i_t	1.83	0.09	4.60	0.73	4.71	0.13*	-0.16**	-0.33***	0.38***	0.23***	0.21***	0.51***	1	
(9) EPU_t	118.67	47.31	376.84	49.67	9.07	0.33***	0.42***	-0.13*	-0.46***	0.10	-0.01	0.02	-0.02***	1

(***) Denotes significance at 1%, (**) at 5%, and (*) at 10% test level.

Source: Authors' calculations based on data from the Central Bank of Colombia.

Table A2

Unit root and stationarity tests

Variables	ADF				PP				KPSS			
	Lags	Esp.	Test	CV (5%)	Band	Esp.	Test	CV (5%)	Band	Esp.	Test	CV (5%)
$Error_t$	0	C	-3.48	-3.46	4	C	-3.63	-3.46	10	C	0.06	0.73
Dis_Ex_t	0	N	-2.12	-2.57	4	C	-4.03	-3.46	10	C	0.44	0.73
$REPU_t$	0	N	-3.35	-2.57	8	N	-2.42	-1.94	10	C	0.16	0.73
$Inflesz_t$	0	C	-3.74	-3.43	5	C	-2.90	-3.46	10	C,T	0.21	0.14
Dis_Junta_t	0	C	-8.53	-3.46	7	C	-8.97	-3.46	8	C	0.08	0.73
$dis\_inf_t^e$	0	C	-4.39	-3.46	7	C	-4.13	-2.87	10	C	0.48	0.73
Dif_i_t	0	N	-2.52	-1.94	8	C	-2.10	-1.94	9	C	0.07	0.14
EPU_t	0	C	-5.27	-2.87	3	C	-5.05	-2.87	8	C,T	0.10	0.14

CV = critical value. Trend (T), and/or constant (C), or neither trend nor constant (N) are included based on the Schwarz information criterion.

The KPSS test was performed using the Newey-West bandwidth.

Source: Authors' calculations.

Table A3

Unit root with break test

Series	Specification	Estimated break	t-stat	5%
$Error_t$	Intercept break	Nov. 2014	-4.96	-4.64
Dis_Ex_t	Intercept break	Sep. 2014	-4.62	-4.44

Source: Authors' calculations.

Table A4

Serial correlation and heteroskedasticity tests

Test	Breush-Godfrey LM test		Breush-Pagan-Godfrey test	
	F-stat	P-value	F-stat	P-value
Eq. [5] ARDL-HAC	1.47	0.08	0.96	0.46
Eq. [6] ARDL-HAC	1.72	0.18	5.81	0.00

Source: Authors' calculations.