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Inflation targeting in Brazil: Is the official target actually pursued?

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Abstract

This paper investigates whether the Brazilian Central Bank effectively pursues the midpoint of the official inflation target through the estimation of its implicit target using a time-varying parameter model from 2002Q1 to 2024Q4. The results indicate that the implicit target frequently exceeded the official midpoint, especially in 2005-2006 and 2013-2015. This pattern has important implications for central bank credibility and inflation expectations, as persistent deviations between formal targets and effective policy may increase uncertainty about future inflation and erode the anchoring role of the regime.

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1. Introduction

Does the adoption of an explicit inflation targeting (IT) regime necessarily guarantee that the central bank (CB) pursues the official target? Although tolerance bands are designed to accommodate volatility arising from exogenous shocks, they may also grant the monetary authority discretion to systematically deviate from the official target midpoint.

As IT frameworks proliferate among developing economies (IMF, 2024), evidence from mature emerging-market regimes becomes crucial for understanding how these regimes operate in practice. Brazil is a particularly relevant case study: it was an early adopter in 1999, and its CB has received international recognition, including multiple awards over the years (The Banker, 2018, 2021; Central Banking, 2024).

Despite these credentials, Brazil's track record raises doubts regarding the CB's adherence to the official midpoint. Inflation has exceeded the midpoint more than 80% of the time, breaching the upper bound in more than 30% of cases. These persistent deviations have sparked debate among economists and market analysts in the public sphere over whether the CB effectively targets the midpoint in practice (see Folha de S. Paulo, 2005; Veja, 2011; CNN Brasil, 2025a). Notably, policymakers responsible for setting the explicit inflation target have publicly characterized inflation levels inconsistent with the midpoint as "normal" (CNN Brasil, 2025b), suggesting a tacit acceptance of persistent deviations. Contrasts between formal target design and effective policy practice raises a broader question: whether adopting an explicit target implies a genuine commitment to the official midpoint.

To investigate this issue, we employ the methodology developed by Leigh (2008) to estimate the targets implicitly pursued by CBs in countries that do not adopt an explicit numerical inflation target but operate under a similar framework. Thus, we estimate an implicit, time-varying target midpoint for Brazil, which is consistent with the economic data. Finally, we compare this estimated target with the official target. Unlike previous work (see Carvalho and Muinhos, 2023), our approach considers a time-varying neutral interest rate, which is particularly relevant given the well-documented fluctuations of this variable in the country (e.g., Gomes da Silva and Araújo, 2016; Fonseca et al., 2022; BCB, 2024). In addition, we estimate the neutral rate using a methodology that accounts for time-varying volatility during the pandemic and incorporates persistent Covid-19 supply shocks. Our findings show that the implicit target often exceeded the explicit one, with more pronounced misalignments in 2005–2006 and 2013–2015, possibly suggesting weaker commitment to the official midpoint.

2. Methodology

Leigh (2008)'s approach depends on the natural interest rate and the potential output, which we estimate using the Holston et al. (2023) methodology, employing the following versions of the IS and hybrid New Keynesian Phillips curves:

$$\tilde{y}_t = \alpha_1 \tilde{y}_{t-1} + \alpha_2 (r_{t-1} - r^*_{t-1}) + \alpha_3 s_t + \varepsilon^{\tilde{y}}_t \tag{1}$$

$$\pi_t = \beta_0 + \beta_1 \pi_{t-1} + \beta_2 E_t\{\pi_{t+4}\} + \beta_3 \Delta e_{t-3} + \beta_4 \tilde{y}_{t-1} + \varepsilon^{\pi}_t \tag{2}$$

where $\tilde{y}_t = 100(y_t - y^*_t)$ is the output gap, y_t is the logarithm of real GDP, y^*_t is the logarithm of the unobserved potential output, r_t is the short-term real interest rate, and r^*_t is the neutral interest rate. Moreover, s_t represents the fiscal impulse, π_t is the inflation rate, π^e_t denotes inflation expectations, and Δe_t is the variation of the exchange rate. The remaining equations

are as follows:

$$y_t^* = y_{t-1}^* + g_{t-1} + \varepsilon_t^{y^*} \tag{3}$$

$$g_t = g_{t-1} + \varepsilon^g \tag{4}$$

$$r_t^* = \gamma_1 g_t + \gamma_2 r_t^i + z_t \tag{5}$$

$$z_t = \theta z_{t-1} + \varepsilon^z \tag{6}$$

Potential output follows a random walk with stochastic drift, driven by potential output growth, g_t, which itself evolves as a random walk. The neutral real interest rate, r_t^*, is a function of g_t and other determinants captured by z_t, as in the original specification; however, we add the international interest rate, r_t^i, to capture global financial influences (Gomes da Silva and Araújo, 2016; Fonseca et al., 2022).

Following Holston et al. (2023), the estimates account for pandemic-related volatility without imposing it directly by introducing variance-scaling parameters that multiply the innovation variances in the output gap and inflation equations. Moreover, persistent Covid-19 supply shocks are accommodated by adjusting potential output using the Covid-19 Stringency Index of Hale et al. (2021), d_t:

$$y_{t,Covid}^* = y_t^* + \frac{\phi}{100} d_t \tag{7}$$

The Covid-adjusted output gap is then

$$\tilde{y}_{t,Covid} = 100(y_t - y_{t,Covid}^*) = 100(y_t - y_t^*) - \phi d_t, \tag{8}$$

which replaces the standard output gap in the IS and Phillips curve equations, while other equations remain unchanged.

In the second stage, we apply a Kalman filter to estimate the implicit inflation target. The monetary policy rule is specified as

$$i_t = \rho i_{t-1} + (1-\rho)\big[r_t^* + E_t\{\pi_{t+4}\} + (\psi_1 - 1)(E_t\{\pi_{t+4}\} - \overline{\pi}_{t+4}) + \psi_2 \tilde{y}_t\big] + \varepsilon_t^i \tag{9}$$

with $i_t = (r_t + \pi_t^e)$ denoting the short-term nominal interest rate and $\overline{\pi}_t$, the implicit target, following a random walk:

$$\overline{\pi}_t = \overline{\pi}_{t-1} + \varepsilon_t^{\overline{\pi}} \tag{10}$$

In both stages, estimation may be subject to the "pileup problem" discussed by Stock (1994). To address this issue, we follow the original strategies of Holston et al. (2023) and Leigh (2008), which rely on the "median unbiased estimator" proposed by Stock and Watson (1998).

Conceptually, the estimated implicit inflation target represents a target consistent with the data and the implemented policy. Deviations between implicit and explicit targets may arise either from optimal policy under uncertainty, when the monetary authority uses tolerance bands to accommodate exogenous shocks, or from discretionary behavior, possibly reflecting a weaker commitment to the target. Although the estimation framework is agnostic about these sources, the macroeconomic context provides guidance. Divergences that occur during periods of heightened volatility or severe supply shocks are consistent with flexible inflation targeting (optimal accommodation). Conversely, persistent deviations over extended horizons or in relatively stable environments are more indicative of a systematic departure from the official target.

3. Data

The quarterly data cover the period from 2002Q1 to 2024Q4. Real GDP (y_t), obtained from IBGE, is seasonally adjusted, indexed to 2002Q1 = 100, and expressed in logarithms. Consumer prices (π_t) are measured by the 12-month accumulated IPCA (IBGE), while inflation expectations ($E_t\{\pi_{t+4}\}$) are obtained from the Focus Survey of the CB of Brazil and expressed as 12-month-ahead forecasts. The nominal interest rate (i_t) corresponds to the Selic-Over rate (CB of Brazil), and the international rate (r_t^i) is proxied by the three-month U.S. Treasury bill rate (FRED). The nominal exchange rate (Δe_t) is included in quarterly growth rates. Fiscal policy is captured by the fiscal impulse (s_t), defined as the year-on-year change in the cyclically adjusted (using the Hodrick–Prescott filter) central government's 12-month accumulated primary balance (National Treasury Secretary). Finally, the Covid-19 Stringency Index (d_t) is taken as the quarterly average from Hale et al. (2021).

4. Results

Table 1 presents the results. The IS equation coefficients indicate that Brazilian GDP is strongly influenced by its lagged value ($\alpha_1 > 0.80$), while the interest rate gap negatively affects output. The coefficient for pandemic-related restrictions (ϕ) is negative, suggesting that each additional unit in the Covid-19 Stringency Index reduces potential output by approximately 0.13 percentage points (p.p.).

Table 1: Estimation results

	Coefficient	**(Std. Error)**
Eq. (1): IS Curve		
α_1	0.8292***	(0.1531)
α_2	–0.1920**	(0.0915)
α_3	0.0162	(1.2299)
ϕ	–0.1337**	(0.0621)
Eq. (2): Phillips Curve		
β_0	–1.7656*	(0.9886)
β_1	0.6735***	(0.0692)
β_2	0.7001***	(0.1130)
β_3	0.0422***	(0.0115)
β_4	0.1599***	(0.0584)
Eq. (9): Monetary Policy Rule		
ρ	0.8308***	(0.0449)
ψ_1	4.3422***	(1.0635)
ψ_2	0.5621	(0.4762)

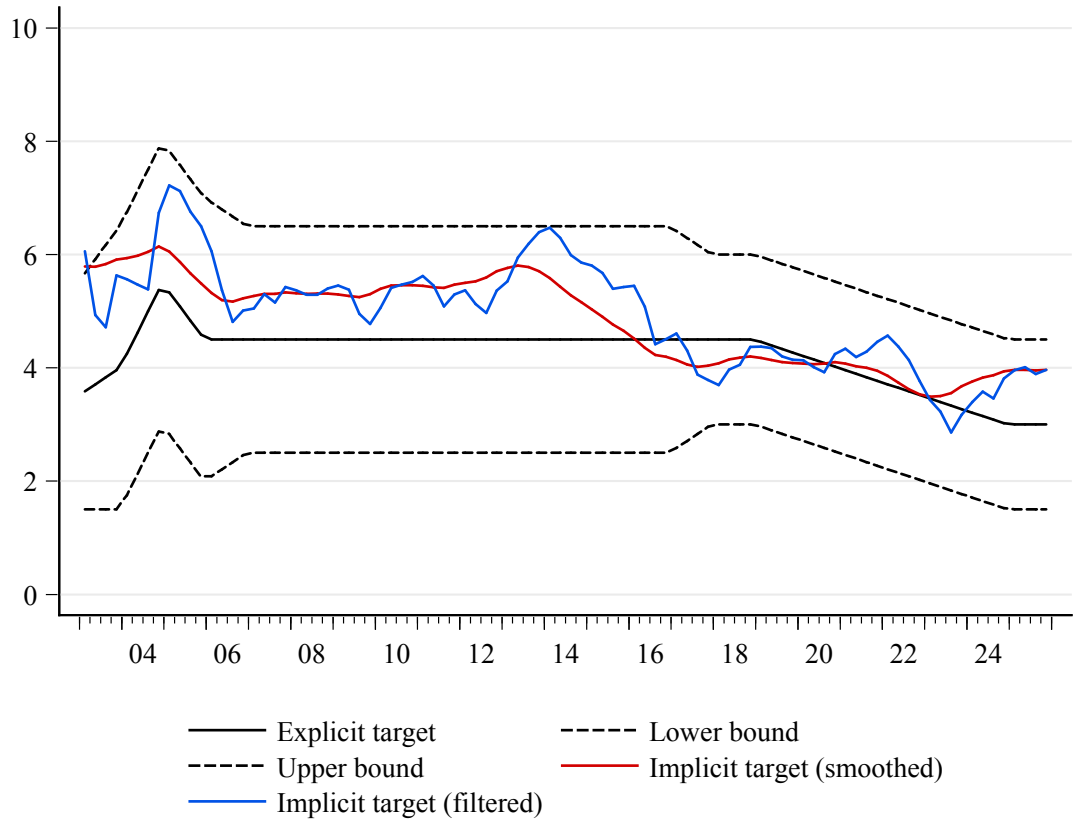
Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

For the Phillips curve, the coefficients on lagged inflation (β_1), inflation expectations (β_2), and the exchange rate (β_3) are all positive and statistically significant. The output gap coefficient (β_4) is positive and significant, indicating that a 1 p.p. increase in the output gap raises inflation by 0.16 p.p.

The monetary policy rule estimates are consistent with those reported by Nobrega et al. (2022) for Brazil. The results suggest a high degree of smoothing ($\rho > 0.80$) and a strong response to inflation deviations from the target ($\psi_1 = 4.34$). In contrast, the estimated response to the output gap is weaker: although the point estimate would imply a 0.56 p.p. increase in the policy rate for a one-percentage-point rise in the gap, the effect is not statistically significant, consistent with the absence of an explicit dual mandate in Brazil.

Figure 1 compares the implicit inflation target—using both the one-sided (filtered) and two-sided (smoothed) estimates—with the explicit target and its tolerance interval. According to the two-sided estimates, in 2003 the implicit target exceeded the explicit target midpoint by 2.2 p.p., but this gap narrowed in subsequent quarters, reaching 0.7 p.p. in 2005Q1. Thereafter, it widened again and remained relatively stable, fluctuating between 0.7 and 1.0 p.p. throughout 2006–2011. The implicit target rose from 2012, peaking at 5.8% in mid-2013, before falling and aligning with the explicit midpoint of 4.5% in 2016Q1. The decline continued, with the implicit target falling slightly below 4.5% in 2017–2018, anticipating the formal reduction of the official target.

Figure 1: Implicit and explicit inflation targets



Between 2017 and 2024, the Brazilian IT regime experienced important reforms: the tolerance band was reduced from ± 2 p.p. to ± 1.5 p.p. in 2017, and the explicit target midpoint was gradually decreased from 4.5% to 3% between 2018–2024. From 2020 onward, the implicit target closely tracked the path of the explicit one until late 2023, when it began to rise again. These years of reform and closer alignment with the official target coincided with the international recognition of the CB of Brazil (The Banker, 2018, 2021; Central Banking, 2024). By the end of the sample the implicit target stood at about 4%, compared with an explicit midpoint of 3%. This renewed divergence is consistent with recent debates regarding commitment to the inflation target (CNN Brasil, 2025a) and may reinforce concerns about monetary policy credibility, as well as the role of fiscal conditions in shaping inflation expectations and perceptions of target convergence.

As expected, the one-sided estimates display greater variability. The implicit target was more aligned with the explicit target in 2003–2004, but showed greater misalignment in 2005–2006, 2013–2015, and 2021–2022. Our one-sided results are quite similar to those observed in Carvalho and Muinhos (2023) from 2012 onwards. However, for the earlier period, their estimates suggest that the implicit target was consistently lower than the explicit one. This discrepancy with our results is likely driven by their assumption of a time-invariant neutral interest rate, whereas the empirical evidence points to a substantial decline in the neutral interest rate over the period (see Gomes da Silva and Araújo, 2016; Fonseca et al., 2022; BCB, 2024).

Since one-sided estimates rely exclusively on information available at each point in time, they proxy policymakers' real-time perceptions. Comparing one-sided and two-sided estimates helps distinguish between deviations driven by uncertainty and shocks and those reflecting systematic departures from the official target.

In 2003–2004 and 2007–2012, the one-sided implicit target was closer to the explicit midpoint than the two-sided estimate, suggesting that ex-post misalignment primarily reflects adverse shocks and real-time uncertainty, although a residual gap remains. In contrast, in 2005–2006 and 2013–2015, the one-sided implicit target systematically exceeded both the explicit midpoint and the two-sided estimate, indicating contemporaneous policy choices inconsistent with the official target midpoint. The latter period, in particular, coincides with the consolidation of the so-called "New Macroeconomic Matrix," a policy framework characterized by discretionary interventionism, expanded public credit, administrative price interventions, and greater tolerance for inflation (Gomes da Silva and Fishlow, 2021). These episodes also coincided with domestic debates over the monetary authority's commitment (Folha de S. Paulo, 2005; Veja, 2011). From 2016 to 2024, including the pandemic period, misalignment became less intense and persistent, again pointing to unanticipated shocks as the dominant factor. This interval also coincides with increased international recognition of the Brazilian CB (The Banker, 2018, 2021; Central Banking, 2024). However, toward the end of the sample period, the widening gap between the two-sided implicit target and the official midpoint aligns with renewed concerns regarding policy commitment (CNN Brasil, 2025a).

Figure 2 compares 12-month accumulated inflation with implicit and explicit targets. Initially, inflation exceeded 15% amid concerns that the new president might abandon previous economic policies, including the IT regime. As these concerns dissipated, inflation fell rapidly. However, with a rebound in the implicit target, inflation accelerated again in 2004–2005. From 2006 to 2012 the implicit target hovered around 5.3% (while inflation averaged about 5%). It then increased, reaching 6.4% in 2014Q1, against a target upper bound of 6.5%. Consistent with that, inflation accelerated, surpassing 10% in 2015Q4. By apparently seeking an implicit target closer to the official midpoint, the CB reduced inflation. Between 2017 and 2019, the implicit target remained near 4.1% (slightly below the explicit target), and inflation averaged

4.2%. Early in the pandemic, inflation fell sharply, but it reversed midyear and exceeded the explicit target in early 2021. With the pandemic shock, the implicit target rose as the CB tolerated higher inflation. After declining in 2022, the implicit target increased again, stabilizing around 4% in 2025. Inflation remained above the explicit target throughout the post-pandemic period, averaging 4.7% between 2023 and 2025.

Figure 2: Inflation vs implicit inflation targets

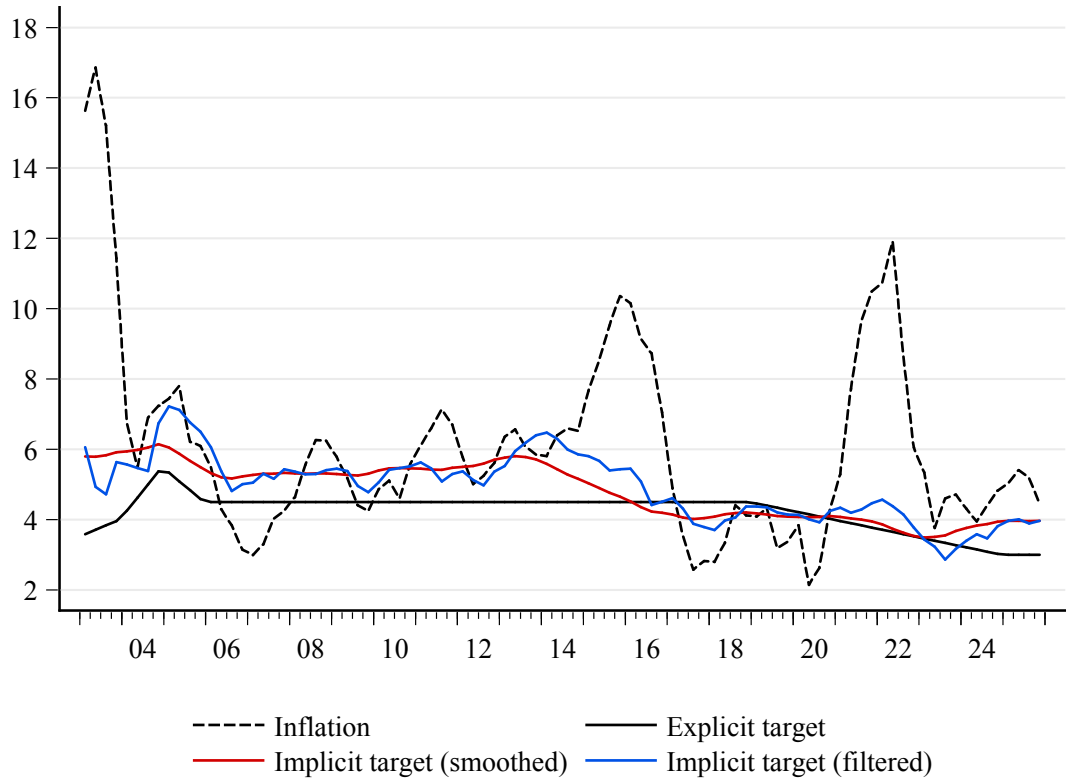
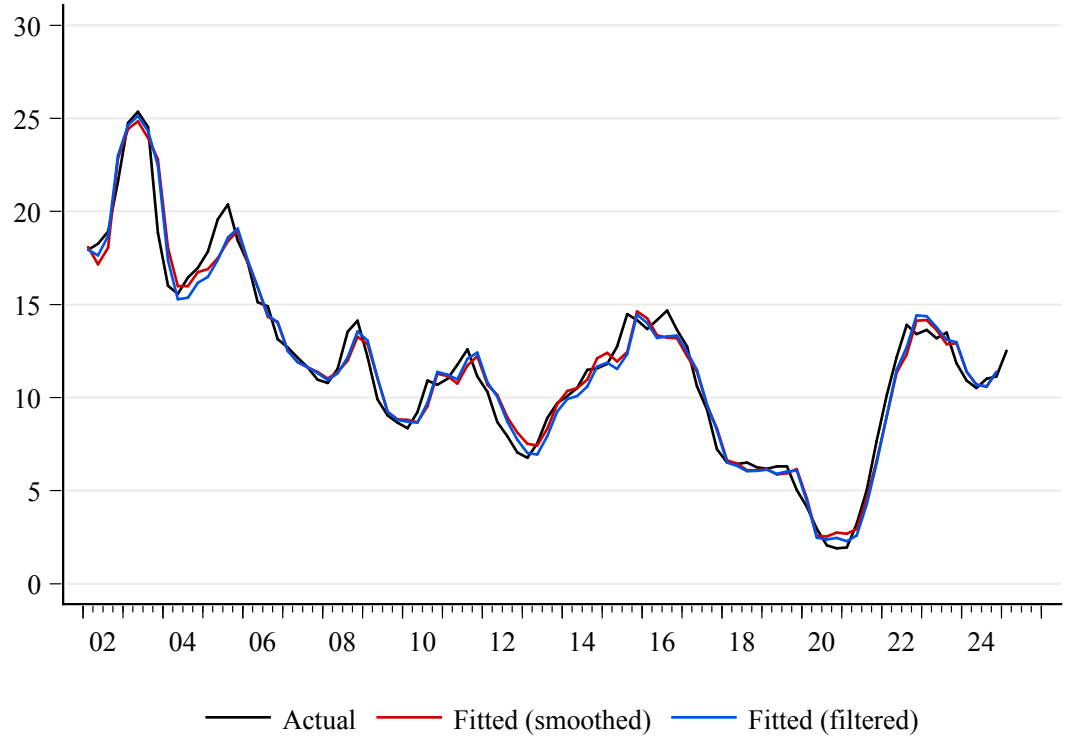


Figure 3 shows that the estimated monetary rule closely tracks the actual path of the nominal interest rate. This tight alignment indicates that the estimated implicit target is consistent with the underlying economic conditions and the implemented policies. Nevertheless, in 2005 the CB adopted a more hawkish stance than the model predicted—possibly reacting to accelerating inflation after pursuing a higher implicit target in the prior quarters (Figure 2)—which led to inflation falling below the explicit target between late 2006 and 2007. This result may suggest that monetary policy was, in fact, more closely aligned with the official target over that period than the estimated implicit target would indicate. The interest rate was on average 0.8 p.p. higher than predicted in 2016Q2–2017Q1, reflecting efforts to control inflation after it surpassed 10% in 2015. Similarly, in 2021Q4–2022Q3 the CB tightened more aggressively in response to renewed price pressures during the pandemic.

Figure 3: Nominal interest rate: actual vs fitted values (% p.a.)

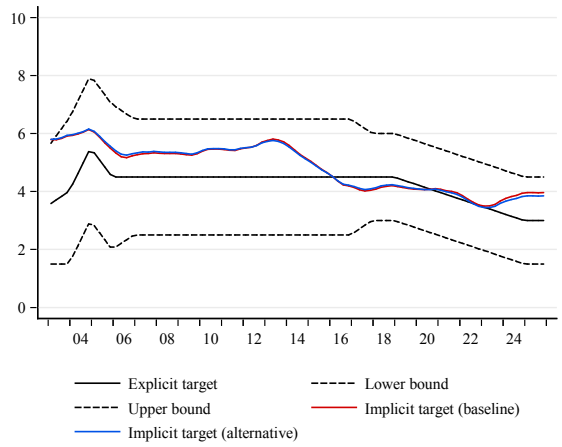


5. Robustness

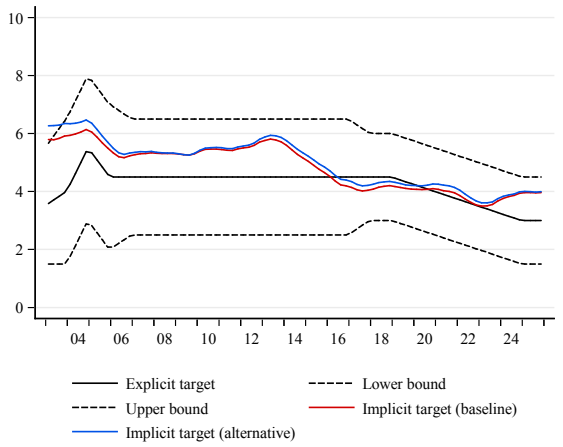
As robustness checks, we re-estimate r^* and y^* using two alternative proxies. First, we replace the fiscal impulse with the year-on-year change in the non-cyclically adjusted central government's 12-month accumulated primary balance, a more direct and less model-dependent measure of the fiscal stance. Second, to address concerns that the Selic-Over rate may introduce noise during risk-off episodes, we substitute it with a short-run market rate, namely the 6-month Swap Pre-DI rate. Panels (A) and (B) of Figure 4 compare our baseline implicit inflation target (red line) with the estimates obtained under these two alternative specifications (blue line). The results are robust, although the second exercise implies a larger difference between implicit and explicit targets during 2003–2005.

To further assess robustness, we re-estimate the monetary policy rule using two external measures of the output gap, provided by the Independent Fiscal Institution (IFI) and the Getulio Vargas Foundation (FGV), thereby limiting dependence on the model-based measure of economic slack. Panels (C) and (D) of Figure 4 compare the baseline implicit inflation target (red line) with the alternative estimates (blue line). Results remain qualitatively unchanged, with a slightly smaller difference between the explicit and implicit targets in 2003–2005. Conversely, the second exercise suggests a more pronounced divergence during the pandemic period. Taken together, the exercises in this Section indicate that the main findings remain broadly robust across the alternative proxy choices considered, with only limited sensitivity in the early years of the sample and during the pandemic period.

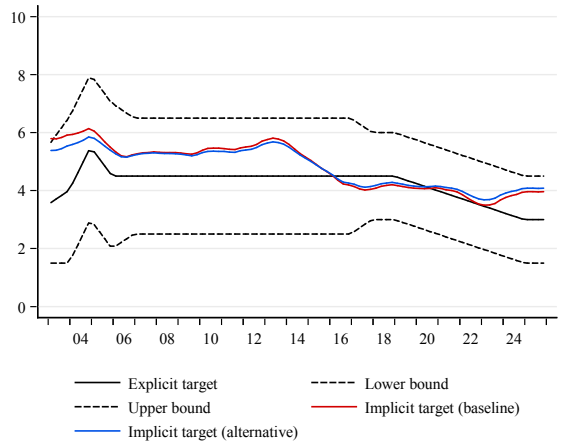
Figure 4: Implicit inflation target: baseline vs. alternative specifications



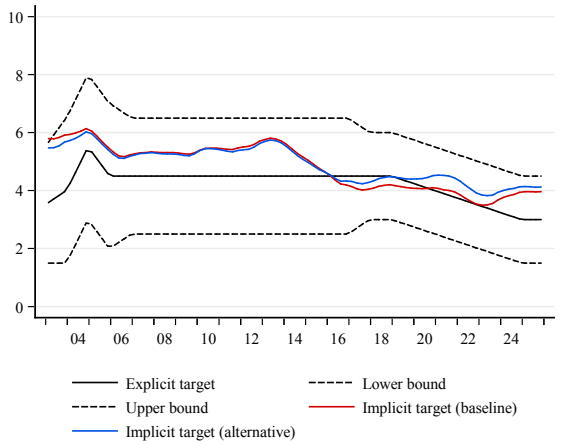
Panel (A) - Alternative fiscal impulse proxy



Panel (B) - Alternative market interest rate proxy



Panel (C) - Alternative output gap proxy (IFI)



Panel (D) - Alternative output gap proxy (FGV)

6. Conclusion

Does the Brazilian CB pursue the official target? Our findings indicate that the implicit target exceeded the explicit one for most of the period, especially in 2005–2006 and 2013–2015. The main exceptions were 2017–2019, when the implicit target was slightly below the official target midpoint, and 2020–2022, when they were closely aligned. Our analysis is consistent with recurrent media claims that, in certain periods, the CB prioritized avoiding breaches of the upper bound rather than hitting the midpoint. Whatever the case may be, such a pattern may increase uncertainty about future inflation—an issue that future research could further investigate. This could also feed additional monetary policy uncertainty, in the spirit of Aguilar et al. (2026).

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The authors report there are no competing interests to declare.

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