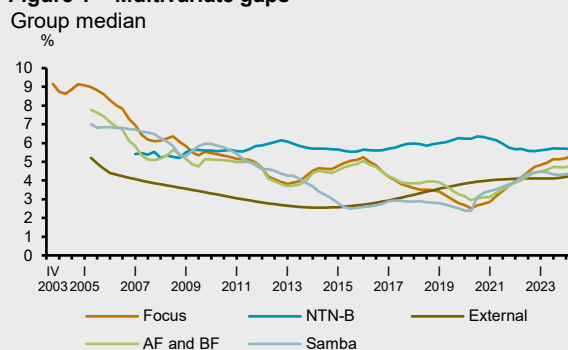# Update of neutral real interest rate measures in Brazil

The economy's neutral real interest rate is a fundamental reference in the formulation of monetary policy. Nevertheless, some facts make it inherently difficult to use in this process, namely it being an unobservable variable and one that changes over time according to the evolution of its determinants. Therefore, its estimates are highly uncertain and need to be frequently reassessed. This box presents an update of several estimates of the neutral real interest rate for the Brazilian economy[1], obtained via different methodologies. It should be emphasized that other approaches are available in the literature and may also be considered in the monetary authority's decision-making process.

Figure 1 shows the evolution over time of the medians for several groups of neutral interest rate measures, while Table 1 shows a comparison of different measures between 2023Q2 and 2024Q2[2]. After reaching a trough with the outbreak of the Covid-19 pandemic, the estimated rates, in general, have followed an upward trend. The comparison between the estimated values for 2023Q2 with those for 2024Q2 reveals that neutral interest rates increased when assessed by the Focus survey, the PCQ, the interest rate parity, and the output gap-based high and low frequency interest rates, while neutral rates based on the NTN-Bs market rates discounted by the term premium[3] followed a downward trend. In turn, neutral interest rates based on the BCB's models remained relatively stable. The average neutral real interest rate obtained through different methodologies rose in the period under analysis from 4.8% to 4.9%, while the median grew from 4.8% to 5.0%. The interval between the 25th e 75th percentiles, previously from 4.4% to 5.5%, became 4.7% to 5.5%. In turn, the median for the several groups of estimates rose from 4.6% to 5.0%.

Figure 1 – Multivariate gaps
Group median

Obs.: Data period: 2001Q1–2024Q1.

1/ Methodological details are available in the box Measures of neutral real interest rate in Brazil of the June 2023 IR.
2/ Data calculated until the cut-off date of June 14, 2024.
3/ In the box Measures of neutral real interest rates in Brazil of the June 2023 IR, the term premium was based on the difference between market and Focus survey real rates for the same horizon. In this box, instead, the term premium is based on the Adrian, Crump and Moench (2013) model. This model is within the Gaussian class and is estimated sequentially by ordinary least squares via three regressions. Currently, this is the mainstream approach for estimating long-term risk-neutral interest rates and the term premium, with several central banks such as the New York Fed updating and releasing related results.

Table 1 – Neutral real interest rate in Brazil
Estimates for 2023Q1[1] and 2024Q2[2]

% p.a.

Methodology	2023Q2	2024Q2
Ex-ante real Selic rate from the Focus survey		
Real Selic expected in 4 years	4.8	5.0
Real Selic expected in 1 year, HP filter	5.2	5.7
Group median	5.0	5.4
High and low frequency neutral rates		
Band-Pass gap (HF)	4.8	5.0
Beveridge-Nelson gap (HF)	4.8	5.0
Band-Pass gap (LF)	4.3	4.8
Beveridge-Nelson gap (LF)	4.4	4.8
Group median	4.6	4.9
Real market rates discounted of the term premium[2]		
5 years	5.5	5.4
10 years	5.6	5.5
20 years	5.6	5.6
5 to 10 years	5.7	5.6
5 to 20 years	5.7	5.7
10 to 20 years	5.7	5.7
Group median	5.7	5.6
Uncovered interest rate parity		
Treasury 1y + Embi + exchange rate risk premium	4.0	4.3
TIPS 5y + Embi + exchange rate risk premium	4.1	4.1
TIPS 5y + CDS + exchange rate risk premium	3.5	3.5
Laubach-Williams (two-sided) + Embi + exchange rate risk premium[3]	5.3	5.1
Laubach-Williams (two-sided) + CDS + exchange rate risk premium[3]	4.6	4.5
Group median	4.1	4.3
Neutral interest rate from the BCB's models		
2 years future rate - Samba model	3.8	3.6
5 years future rate - Samba model	3.7	3.5
Aggregated model[4]	5.5	5.5
Disaggregated model	5.1	5.2
Group median	4.4	4.4
Neutral real interest rate from the PCQ[5]		
Short-term median	4.8	5.2
2 years median	4.8	5.0
5 years median	4.5	5.0
Group median	4.7	5.0
Summary		
Mean	4.8	4.9
Median	4.8	5.0
25th percentile	4.4	4.7
75th percentile	5.5	5.5
Median of group medians	4.6	5.0

1/ Data collected up to the cut-off date of June 14, 2024.

2/ The term premium is calculated based on the model by Adrian, Crump, and Moench (2013).

3/ For the portion referring to the neutral real interest rate published by the Fed-NYC,
   estimated with the Laubach-Williams model, the latest available data refers to 2024Q1.

4/ Rates obtained endogenously by filtering small-scale semi-structural models.

5/ Questionnaires refer to June 2023 and June 2024, respectively.

References

ADRIAN, T.; CRUMP, R. K.; and MOENCH, E. (2013). Pricing the Term Structure with Linear Regressions. *Journal of Monetary Economics*, 110 (1), 110-38.