INTERNATIONAL MONETARY FUND

# Monetary Policy Transmission to Lending Rates: Evidence from Brazil

Daniel Leigh and Rui Xu

WP/25/152



**2025**
JUL

WORKING PAPER

 WP/25/152

**IMF Working Paper**
Western Hemisphere Department

# Monetary Policy Transmission to Lending Rates: Evidence from Brazil

**Prepared by Daniel Leigh and Rui Xu***

Authorized for distribution by Ana Corbacho
July 2025



**ABSTRACT:** This paper estimates the strength of monetary policy transmission to bank lending rates in Brazil. We identify monetary policy shocks using forecast errors from Brazi's daily *Focus* survey of professional forecasters. We then estimate the pass-through to lending rates based on an instrumental variable application of local projections and find an aggregate pass-through of 70 percent after four months, reflecting full pass-through to market-based lending rates and 20 percent to government-directed credit interest rates. Analysis using bank-level data reveals varying degrees of pass-through across credit types, from 40 percent for payroll-backed loans to 80 percent for working capital loans, and stronger pass-through for larger banks. Estimated pass-through has increased since 2020 due to more responsive corporate loans.

**RECOMMENDED CITATION:** Leigh, Daniel and Rui Xu. 2025. "Monetary Policy Transmision to Lending Rates: Evidence from Brazil." IMF Working Paper.

| | |
|---|---|
| JEL Classification Numbers: | E43, E51, E52, C22, C26, C54. |
| Keywords: | Brazil, monetary policy, interest rate pass-through, bank lending rates, credit types, post-pandemic. |
| Author's E-Mail Address: | DLeigh@imf.org; RXu@imf.org |

* The author(s) thank Ana Corbacho, Philip Barrett, Ricardo Sabbadini, Andre Minella for their helpful and suggestions and seminar participants at the Central Bank of Brazil, Ministry of Finance, and MCMSR at the IMF.

# I. Introduction

Despite double-digit policy interest rates since 2022, growth of credit and economic activity in Brazil has been strong. The Central Bank of Brazil's broad credit gap measure—the deviation of total private credit from its estimated historical trend—expanded in 2024 to its highest level since 2016 at 5.4 percent of GDP (Figure 1). This has prompted discussions about the effectiveness of monetary policy in Brazil. As in other major economies, there is a lack of consensus on how much policy rate changes pass through to lending rates for Brazilian households and firms, a central channel through which monetary policy affects the economy.

Some studies suggest that the pass-through to lending rates in Brazil is constrained by idiosyncratic factors, including a sizable proportion of government-directed (earmarked) credit, a history of macroeconomic instability, and high interest rate margins. Research by Elias and Guimaraes (2024) and Takeda and others (2005) indicates an insignificant pass-through from policy rates to household credit lending rates due to high interest rate spreads. Other studies, including those by the Central Bank of Brazil (BCB, 2022) and Divino and Haraguchi (2020), demonstrate a pass-through well above one for personal credit lending rates. De Mello and de Castro (2012) and Divino and Haraguchi (2020) find evidence of asymmetric pass-through, with lending rates more responsive to tightening cycles than to easing cycles. Furthermore, the influence of bank concentration and financial regulation on pass-through dynamics is emphasized in research by de Mello and Pisu (2010) and Alencar and others (2020).

In addition, it remains unclear to what extent the COVID-19 pandemic and recent changes in Brazil's financial market have influenced pass-through. On the one hand, pandemic-era liquidity injections by the BCB and government loan guarantees may have moderated pass-through by distorting credit pricing. On the other hand, structural changes, including capital deepening and reform of the Brazilian Development Bank (BNDES) in 2018 may have enhanced lending rate flexibility and pass-through from policy rates. Unlike for other major economies, where studies have shown weakened monetary policy effectiveness since the pandemic (see, for example, Barrett and Platzer 2024; Prabheesh and others 2021; Andaloussi and others 2024; and Beyer and others 2024), evidence on Brazil's interest rate pass-through is limited to the pre-pandemic period.

To shed light on these issues, this paper addresses three questions related to the strength of monetary policy transmission. First, how strong is the pass-through from policy rates to aggregate lending rates in Brazil? Second, has the pass-through changed significantly since 2020 in the context of the pandemic and various structural changes in the credit market? And, finally, how does the pass-through vary across loan types and bank characteristics? In addressing these questions, our research introduces three main innovations.

The first innovation is to construct a daily dataset of monetary policy shocks in Brazil using forecast errors of policy rates from the *Focus* survey of professional forecasters maintained by the BCB for the 2012-2025 period. We measure the forecast error by comparing the actual policy rate (that is, Brazil's SELIC rate) with forecasts of the policy rate from the day before monetary policy announcements. This method aligns with research for other economies using high-frequency monetary policy shocks from surveys or financial instrument price changes around central bank announcements.[1] The *Focus* survey is prominent in Brazil's public policy debate

[1] See Checo, Grigoli, and Sandri (2024) for an example of monetary policy shocks based on forecast errors in surveys. Examples of papers that construct monetary policy shocks from financial instruments include Kuttner (2001), Bernanke and Kuttner (2005), Nakamura and Steinsson (2018), Altavilla and others (2019), Cesa-Bianchi and others (2020), Braun and others (2023), Das and Song (2023), and Bolhuis and others (2024).

as it informs the central bank about market expectations and influences financial market prices, as shown by Araujo and Caoduro (2024).

Second, we employ local projections and instrumental variable methods to estimate pass-through over a one-year horizon. We use our aforementioned monetary policy shock series as an instrumental variable for changes in the monetary policy rate. Earlier studies utilizing daily lending rates primarily concentrate on immediate impact responses (for example, within one week, as in Divino and Haraguchi 2023), often overlooking the possibility that pass-through may require months to fully materialize.

Third, to provide more granular insights into the transmission channel, we leverage daily lending rates from about eighty Brazilian financial institutions and estimate pass-through by credit type.[2] The panel dataset enhances the power of inference and allows estimates to differ across credit types and bank characteristics. Studies for other economies highlight significant pass-through heterogeneity. Belke and others (2013) find more complete pass-through for loans to non-financial corporate clients compared to households in South Africa. Byrne and Kelly (2019) find that poor asset quality and high credit risk weaken pass-through to banks' lending rates in Europe. Our approach sheds light on such heterogeneities for the case of Brazil.

Our findings indicate that pass-through from policy rates to average lending rates stabilizes at 70 percent after four months. This incomplete pass-through is driven by a weak response of government-directed credit to policy rate changes, with a pass-through estimated at 20 percent. Our finding of weak pass-through to government-directed credit is consistent with the analysis of Aghabarari and others (2025) that used detailed credit registry data for the 2011-2016 period. Government-directed credit (or “earmarked” credit) accounts for about 42 percent of total credit in 2024 and is funded by special funds that are often constitutionally established, through federal government lending, and through tax-exempt financial instruments and demand deposits.[3] By contrast, market (or “non-earmarked”) lending rates respond one-for-one to policy rate changes, implying full pass-through. These estimates imply that raising average bank lending rates by one percentage point requires a monetary policy rate increase of about 1.4 percentage points (one divided by 0.7).

Regarding changes since 2020, we find that pass-through has increased for both market and government-directed credit, reflecting more responsive corporate loan rates. For market credit to firms, the expansion of the domestic bond market since 2020 has offered firms alternative sources of financing, which may have encouraged banks to be more responsive to monetary policy changes. For government-directed credit to firms, the stronger pass-through reflects the 2018 reform of BNDES, which more closely aligned its lending rates with market-based rates (TLP).

Our bank-level analysis reveals significant heterogeneity in pass-through across credit types, ranging from 40 percent to 80 percent for market lending rates. Loans for corporate working capital are the most responsive to policy rate changes, with the effect peaking at 80 percent after two months. Unsecured consumer loans (credit cards and non-payroll personal loans) are also responsive to policy rate, with the effect peaking at 80 percent after four months. Rates on payroll-deducted loans are the least responsive, most likely on account of interest rate caps applied to such loans, with pass-through peaking at 40 percent after ten months.

[2] Some non-bank financial institutions, such as fintech lenders and the financing arms of auto dealers, are also included in the panel dataset. For simplicity, we use the term “banks” loosely to refer to all financial institutions included in the database. The bank-level panel dataset does not cover directed credit provided by the government.

[3] See Byskov (2019) for a detailed discussion of earmarked credit in Brazil.

The incomplete pass-through estimate for bank-level rates contrasts with the full pass-through estimate for aggregate market rates, and this difference reflects the dominant role of large banks in the aggregate data. The bank-level estimate is a panel-data estimate—an unweighted average of pass-through estimates across banks. By contrast, the aggregate-data estimate is based on economy-level weighted average lending rates, which by definition give greater weights to banks with larger loan quantities. We confirm that larger banks exhibit stronger pass-through, which can account for the smaller pass-through estimates using bank-level data. When our panel-data analysis limits the sample to the largest five banks, the results indicate a nearly complete pass-through, except for payroll-deducted loans. Smaller banks demonstrate significantly weaker pass-through, which may reflect lower asset quality and higher credit risk. No differences were found for fintech lenders or public banks relative to private commercial banks. nor was there evidence of asymmetry between hiking cycles and easing cycles.

Our results also suggest that interest rate caps have weakened pass-through for payroll-deducted loans. Caps for pension-backed loans are set by the National Social Security Institute (INSS) and caps for civil servants' payroll loans are often included in the contracts between the bank and government agencies or unions (see Chaise 2023). These caps are adjusted periodically and may not reflect policy rate changes. For example, the interest rate ceiling on pension-backed loans has remained at 2.14 percent per month since January 2022, even though policy rates have increased by 5.5 percentage points. When binding, these caps prevent banks from passing higher funding costs on to lending rates, limiting pass-through.

Overall, our results indicate an effective transmission of policy rates to bank lending rates, with a notable strengthening for corporate loans over the past five years. The strong credit growth since 2022, despite tight monetary policy, thus likely reflects other factors influencing credit, including structural transformations within the financial market. The aforementioned positive credit gap is predominantly driven by the expansion of the corporate bond market, where bond issuance has been boosted by debentures offering tax exemption benefits, (Figure 7). In addition, the rapid growth of fintech lenders and digital banks has increased credit availability and heightened competition with traditional banking institutions (Figure 7). Consequently, traditional banks have reduced their lending rates and enhanced operational efficiency to maintain their market share (see Xu, forthcoming). The combined credit supply from traditional banks and fintech lenders has consequently increased.

The rest of the paper is organized as follows. Section II details our dataset and estimation strategy. Section III presents our estimates of pass-through, using both aggregate lending rates and bank-level data. Section IV concludes the paper.

# II. Empirical Strategy

## A. Data

### Aggregate Data

To estimate overall banking system pass-through, we use monthly lending rates of new loans for January 2012 – April 2025. Such data are appropriate for this purpose as they include all financial institutions involved in lending, not just a selection of eighty covered by the bank-level data. Also, aggregate rates average lending

rates weighted by loan volume of each financial institution, thus representing overall prevailing interest rates. The data are also used to investigate if the system-wide pass-through has changed since 2020,

In addition to system-wide pass-through, we obtain separate estimates for market-oriented loan operations (non-earmarked credit) versus government-directed credit (earmarked credit). In Brazil, the government directs funds to specific sectors through banks, including housing, agriculture, and infrastructure. Both public banks and large private banks are involved in extending government-directed credit, with public banks taking the lead.[4] Although its role has declined since 2016, directed credit still accounted for 41.7 percent of total loans at end-2024. As Figure 1 illustrates, lending rates for directed credit comove relatively weakly with the policy rate, while lending rates for market credit comove closely with the policy rate.

**Bank-level Data**

To estimate pass-through for different credit types and bank types, we use a panel dataset with daily lending rates for individual banks by credit type from January 2012 – April 2025, made available by the BCB. The lending rates are seven-day moving averages of interest rates for new credit operations. The panel data are ideal for analyzing individual credit lines and examining differences across bank types. The database covers twenty-one types of credit, including loans to both individual borrowers and firms. The number of banks included in the sample varies by credit types subject to reporting requirements. For some niche loan products, fewer banks report their rates.

Our analysis focuses on the fifteen types of credit indicated in Table 1, which cover more than 90 percent of market credit. The bank-level database excludes government-directed credit. We categorize the fifteen types of credit into six groups: three for consumer loans (unsecured personal loans, payroll-backed loans, and financing of cars and goods) and three for corporate loans (working capital loans, guaranteed overdraft, and discounted trade bills). This consolidation increases observations and simplifies result presentation. It also ensures a similar pass-through among loan types within each group.

There is considerable variation in monthly lending rates, as illustrated in Table 1. Household rates (black font) are generally higher than firm rates (blue font), partly due to the higher default risk of consumer loans, especially the unsecured ones (see Figure 1 for non-performing loan ratios).

Credit card revolving lines carry the highest rates, averaging 13.5 percent per month (or 357 percent at an annualized rate) during the sample period. This exceptionally high interest rate reflects high default risk, short loan duration, and specific regulations in Brazil. Unlike banks in countries such as the United States, banks in Brazil are prohibited from charging fees on revolving credit when the minimum payment of the invoice is not made. To recover the administrative costs associated with overdue payments, banks impose elevated interest rates on revolving credit for the first 30 days. The high rate applies only during the first month. After this period, an installment plan is arranged with cardholders at lower interest rates, as shown in Table 1 (see the “Credit Card – financing” rates). Nonpayroll personal loans, which are mostly unsecured, have the second highest lending rates.[5]

[4] The public bank CAIXA supplies 67 percent of Brazil’s mortgage financing. Brazil’s National Development Bank, BNDES, finances long-term investment needs such as infrastructure and technology. The state-owned bank Banco do Brasil has significant loan portfolios in small and medium-sized enterprises (SMEs) and agribusiness. Private banks also offer directed credit, using government funds or earmarked savings accounts for specific sectors.

[5] Nonpayroll loans also include secured products backed by investment, the Severance Indemnity Fund for employees (FGTS), tax returns, home equity, car equity, and more. But most nonpayroll loans are unsecured.

## B. Monetary policy shocks

To estimate the causal effect of policy rates on bank lending rates, we construct monetary policy shocks using the *Focus* survey of professional forecasters maintained by the BCB, which contains forecasts made by 171 banks, asset managers, and other institutions. The survey is conducted daily and contains the market participants' forecasts of several macroeconomic and policy variables, including the SELIC policy rate.

We measure the monetary policy shock as the difference between the actual SELIC rate announced by the Monetary Policy Committee (COPOM) and the expected SELIC rate from the survey one day before the announcement. We calculate the mean and median of the SELIC expectations since the Focus survey does not publish the forecast of each financial institution. Figure 2 shows the resulting shocks. In our study, we use the mean forecast error from the *Focus* survey, but the median yields similar results. The resulting shocks range from -0.5 to 0.3 percentage points.

In the sample period from 2012-2025, there are 106 COPOM meetings, with an average interval of 46 days between consecutive meetings. Meetings generally commence on Tuesday and conclude on Wednesday, at which point the SELIC target rate is determined and announced. The target rate takes effect from the subsequent business day following the meeting until a new decision is rendered in the next meeting.

## C. Local Projections

We estimate interest rate pass-through using local projections with instrumental variables. Noting that the initial monetary policy shock is often followed by further changes in subsequent COPOM meetings, the pass-through is calculated as the average effect per intervention, as in the "cumulative multiplier" specified in Jordà and Taylor (2024) and Ramey and Zubairy (2018). To identify causal effects, we instrument the change in the policy rate (SELIC) with the surprise of monetary policy derived from the *Focus* survey mentioned above.

The equation estimated is:

$$y^{c}_{i,t+h} = \alpha_{\mathrm{i,h}} + \boldsymbol{m(h)}\boldsymbol{s^{c}_{t,h}} + \gamma_{\mathrm{h}} x_t + \mathrm{u}_{\mathrm{i,t+h}}, ; h = 0,\ 1,\ \ldots,\ H; \tag{1}$$

In this equation, $y^{c}_{i,t+h} = (y_{i,t} + \cdots + y_{i,t+h})$, where $y_{i,t+h}$ is the change in lending rate of bank $i$ at horizon $h$ (days) after the monetary policy shock; and $s^{c}_{t,h} = (s_t + \cdots + s_{t+h})$, where $s_{t+h}$ is the cumulative change in SELIC rates from $t-1$ to $t+h$. Control variables $x_t$ include two lags of the outcome variables (the lending rates) and two lags of the policy rate changes; bank fixed effects ($\alpha_{\mathrm{i,h}}$) are included for the panel analysis. For the time series analysis using aggregate lending rates, the subscript $i$ is dropped.

As shown in Jordà and Taylor (2024), the term of interest, $m(h)$, which in our application measures pass-through, can be obtained directly by estimating the local projection in Equation (1). To address endogeneity concerns, we use two-stage least squares (2SLS), where $z^{c}_{t,h} = (z_t + \cdots + z_{t+h})$ is the instrumental variable for $s^{c}_{t,h}$, and $z_{t+h}$ is the cumulative monetary policy shock from $t-1$ to $t+h$.

To assess whether pass-through has changed since 2020, we introduce an interaction term between $s^{c}_{t,h}$ and an indicator dummy variable that takes the value 0 for all pre-2020 observations and the value 1 for all

observations from 2020 onward. The pass-through for post-2020 is the sum of $\widehat{m(h)}$ and the coefficient on the dummy variable interaction term.

For the bank-level analysis, we preprocess the dataset to remove noisy observations. The daily lending rates can be volatile for some small banks, and have sudden jumps (for example, a five-percentage point increase in monthly interest rates from one day to another). We drop such banks and trim observations with large jumps in interest rates (observations above the 95$^{th}$ percentile in absolute value are deleted from the sample).

# III. Pass-through Estimates

**First-stage Results**

We start by assessing the strength of the constructed monetary policy shock as an instrumental variable for changes in the policy rate. The first-stage results are strong, implying that the constructed shock—$z_{t,h}^{c}$ in Equation (1)—is a strong instrument for the cumulative change in SELIC rates $s_{t,h}^{c}$ over each horizon $h$. As Figure 3 reports, the associated *F*-statistics are above 30, indicating that our series of monetary policy shocks have strong explanatory power for the change in the policy rate. The first stage slope coefficients range from 4 to 5 as reported in Figure 3.

**Aggregate Pass-through**

Figures 4 and 5 present the second-stage estimates of pass-through from policy rate changes to aggregate lending rates. Solid lines represent point estimates over a horizon of twelve months, while the dotted lines indicate 90 percent confidence intervals. The reference line at unity indicates full (one-for-one) pass-through.

The pass-through to the rates of all new loans peaks at 70 percent after four months, as shown in panel A of Figure 4. This result is in line with the estimates for other emerging market economies, which, in the survey of Gregor and others (2019), range from sixty percent to eighty percent. The pass-through, though not complete, confirms the effectiveness of monetary policy transmission. The 70 percent average pass-through estimate implies that raising the average bank lending rate by one percentage point requires a policy rate increase of 1.4 percentage points (one divided by 0.7).

The incomplete pass-through is driven by government-directed credit. The pass-through to market credit is complete after four months, whereas that to directed credit is much weaker, at about 20 percent, as shown in panel B of Figure 4. The differential responses of lending rates reflect varying sensitivity of funding cost to policy rates. The funding cost of market credit responds one-for-one to changes in policy rates, whereas the response is only about 40 percent for directed credit, as shown in panel C of Figure 4. The weak pass-through to government-directed credit rates is consistent with the findings of other studies (see, for example, Aghabarari and others 2025; Elias and Guimaraes 2024; BCB 2022; and Bonomo and Martins 2016).

Turning to variation over time, as Figure 5 reports, lending rates appear to have become more responsive to policy rates after 2020. The aggregate pass-through peaks at around 60 percent for the 2012-19 period, while it strengthens significantly to 100 percent after 2020 (panel A). Both market operations and directed credit are estimated to respond more to policy rate changes after 2020, as shown in panel B and E. Among market operations, corporate loans explain the stronger and more immediate pass-through. Among government-directed credit, the improvement comes from BNDES loans.

The stronger estimated pass-through to market loan rates for firms may reflect the expansion of the domestic bond market. Alongside the long-term trend of capital market deepening, legislation approved in 2011 offered tax exemptions for bonds in infrastructure, real estate, and agribusiness, thus contributing significantly to growth of the corporate bond market (see Borensztein 2022). These tax-exempt bonds are more appealing than taxable instruments as interest income and capital gains are not taxed. Their attractiveness increases with higher interest rates, enabling issuers to extend loan maturity and reduce spreads (see Figure 1). This alternative financing source may have pressured banks to be more responsive to policy rate changes, thus strengthening pass-through.

The stronger pass-through for BNDES in recent years may reflect the 2018 reform. Previously, BNDES financing contracts used the long-term interest rate (TJLP), which was largely disconnected from policy rates and involved implicit subsidies. In 2018, new BNDES contracts transitioned to using the new market-based rate (TLP), aligning more closely with market rates and thus strengthening pass-through.

**Pass-through by Credit Types**

Figure 6 shows the pass-through over one year by credit types. The results are based on re-estimating Equation (1) using daily lending rates from around eighty banks for each type of credit.

For the three types of consumer loans in the dataset, estimated pass-through ranges from 40 to 80 percent (panel A). Unsecured personal loans have the highest pass-through, at 80 percent after four months. The pass-through for loans financing cars and other goods peaks at 58 percent after nine months. The rates on payroll-backed loans respond the least to policy rate changes, at below 40 percent. The weak response of payroll-backed loans reflects interest rate caps imposed by Brazilian Social Security Institute (INSS) and other government agencies, as already mentioned.

For corporate loans, pass-through peaks after two months and ranges from 60 percent to 80 percent (panel B). The relatively rapid response, compared to consumer loans, could reflect three factors. First, corporate borrowers are likely to be more financially sophisticated and adjust their investment and borrowing decisions more quickly to interest rate developments. Second, corporate loan spreads are generally narrower than those for consumer loans (see Table 1), leaving banks with less margin to absorb changes in funding costs, which are directly influenced by policy rate adjustments. Third, large firms have alternative financing options, such as the domestic bond market, which increases competition and pressures banks to adjust lending rates more swiftly to market conditions, strengthening pass-through.

Panel data analysis reveals that pass-through is incomplete for all six credit types, in contrast to the full pass-through estimate using aggregate lending rate data. This difference reflects the stronger pass-through to loans from large banks, which play a more dominant role in the aggregate data. The panel data approach used for the bank-level analysis implicitly gives equal weight to each bank, while aggregate pass-through is dominated by larger banks due to their substantial loan portfolios. When the panel data analysis is limited to the top five banks, based on loan portfolio size, the pass-through estimates are larger than for smaller banks, as shown in Figure 6, panels C-F. The lending rates for the largest five banks respond nearly one-for-one to policy rate changes for five out of the six credit types. For smaller banks, pass-through is smaller for each credit type. Pass-through for payroll loans remains low for all banks, on account of the interest rate caps in place for payroll loans regardless of the bank size.

# IV. Conclusion

Strong credit and economic growth in Brazil, despite double-digit policy rates since 2022, have raised questions about the effectiveness of monetary policy transmission and possible obstruction of some channels since the pandemic. Our results suggest that such concerns are largely unwarranted—at least regarding the effectiveness of monetary policy at affecting lending rates faced by households and firms.

Our estimates—based on monthly lending rate data and instrumental variable application using local projections—indicate an aggregate interest rate pass-through of 70 percent after four months, with full pass-through to market lending rates and a 20 percent pass-through to government-directed credit lending rates. The results imply that raising average bank lending rates by one percentage point requires raising the policy rate by 1.4 percentage point. Regarding the suggestion of weaker transmission after the pandemic, our results using post-2020 data in fact suggest a *strengthening* of pass-through for both market and government-directed lending rates, largely on account of corporate loan rates. Using bank-level panel data, we find that pass-through varies significantly across credit types ranging from 40 percent to 80 percent, with working capital most responsive to policy rate changes and payroll-backed loans least responsive. We also find that large banks are more responsive to policy rate changes.

Overall, the findings indicate that the transmission of monetary policy to bank lending rates remains effective. The sustained credit growth observed in Brazil, despite high policy rates, likely reflects countervailing factors, including structural changes in the economy. These developments include the rapid expansion of fintech lenders and capital deepening facilitated by tax-exempt debentures.

Future research could seek a deeper understanding of interest rate pass-through to the corporate bond market. Compared to bank loans, bond yields are more sensitive to market conditions, the macroeconomic environment, credit risk, and liquidity premia, especially for debentures without collateral. Given the significance of the bond market for firm financing in Brazil and other major economies, investigating this pass-through would provide a more comprehensive view of the overall monetary policy transmission to the credit market. Additionally, the impact of tax exemptions on monetary policy transmission deserves further analysis, as the associated tax benefits tend to increase when policy rates are elevated. Notably, the issuance of infrastructure debenture surged in 2024 with compressed spreads, which were occasionally lower than those for government bonds. Further analysis is necessary to investigate how these tax exemptions affect the interest rate pass-through to corporate bonds.

# References

Aghabarari, Leila, Sophia Chen, Deniz Igan, Bernardus Van Doornik. 2025. “The Nuanced Role of Government Credit in Monetary Policy Transmission.” *IMF Working Paper*, Forthcoming.

Alencar, Leonardo S., Rodrigo Augusto Silva de Andrade, and Klenio de Souza Barbosa. 2020. “Creditor’s Protection and Bank Loans: Market Power and Bankruptcy Reform’s Effects.” *Banco Central do Brasil Working Paper Series* No. 521.

Altavilla, Carlo, Luca Brugnolini, Refet S. Gürkaynak, Roberto Motto, and Giuseppe Ragusa. 2019. “Measuring Euro Area Monetary Policy. *Journal of Monetary Economics* 108, 162-179.

Andaloussi, Mehdi Benatiya, Nina Biljanovska, Alessia De Stefani, and Rui Mano. 2024. “Feeling the Pinch? Tracing the Effects of Monetary Policy through Housing Market.” Chapter 2, IMF *World Economic Outlook*.

Aristei, David and Manuela Gallo. 2014. ”Interest Rate Pass-Through in the Euro Area during the Financial Crisis: A Multivariate Regime-Switching Approach.” *Journal of Policy Modeling* 36(2), 273–295.

Araujo, Gustavo Silva, and Giancarlo Noel Caoduro. 2024. “Impact of the Disclosure of Survey Expectations of Macroeconomic Variables on Brazilian Interest Rates”. *Banco Central do Brasil Working Paper Series* No. 604.

Banco Central do Brazil. 2022. “Inflation Report”, Volume 24, No 3.

Belke, Ansgar, Joscha Beckmann and Florian Verheyen. 2013. “Interest Rate Pass-Through in the EMU – New Evidence from Nonlinear Cointegration Techniques for Fully Harmonized Data”, *Journal of International Money and Finance* 37:1-24.

Bernanke, Ben S. and Kenneth N. Kutter. 2005. What Explains the Stock Market's Reaction to Federal Reserve Policy? *The Journal of Finance* 60(3), 1221-1257.

Beyer, Robert, Ruo Chen, Claire Li, Florian Misch, Ezgi O. Ozturk, and Lev Ratnovski. 2024. “Monetary Policy Pass-Through to Interest Rates: Stylized Facts from 30 European Countries”. *IMF Working Paper* No. 2024/9.

Bolhuis, Marijn, Sonali Das, and Bella Yao. 2024. "A New Dataset of High-Frequency Monetary Policy Shocks." *IMF Working Paper* No. 2024/224.

Bonomo, Marco, and Bruno Martins. 2016. “The Impact of Government-Driven Loans in the Monetary Transmission Mechanism: What Can We Learn from Firm-Level Data.” *Banco Central do Brasil Working Paper Series* No. 419.

Borensztein, Eduardo, Eduardo A. Cavallo and Pablo Pereira Dos Santos. 2022. “Infrastructure Bonds. The Case of Brazil.” *IDB Technical Note* No. IDB-TN-2454.

Braun, Robin, Silvia Miranda-Agrippino, and Tuli Saha. 2025. “Measuring Monetary Policy in the UK: the UK Monetary Policy Event-Study Database.” *Journal of Monetary Economics* 149, 103645.

Brink, Nicola. 2024. “Interest Rate Risk Exposures of Non-financial Corporates and Households”. *BIS CGFS Papers* No 70.

Byrne, David and Robert Kelly. 2019. “Bank Asset Quality and Monetary Policy Pass-Through”. *Applied Economics* 51(23), 2501–2521.

Byskov, Steen. 2019. “Earmarked Credit and Public Banks”. *Boom, Bust, and the Road to Recovery*, Chapter 16, 267-278.

Bu, Chunya, John Rogers, and Wenbin Wu. 2021. “A Unified Measure of Fed Monetary Policy Shocks.” *Journal of Monetary Economics* 118:331–349.

Cas, Stephanie Medina, Alejandro Carrion-Menendez, and Florencia Frantischek. 2011. “The Policy Interest-Rate Pass-Through in Central America*.” IMF Working Paper* No.2011/240

Cesa-Bianchi, Ambrogio, Gregory Thwaites, and Alejandro Vicondoa. 2020. “Monetary Policy Transmission in the United Kingdom: A High-Frequency Identification Approach.” *European Economic Review* 123, 103375.

Chaise, Mariana Falcão. 2023. “Credit and Ideology: The Policy of Payroll Deducted Credit during the Workers' Party Years.” *Brazilian Political Science Review 17*(1), e0008.

Checo, Ariadne, Francesco Grigoli, and Damiano Sandri. 2024. “Monetary Policy Transmission in Emerging Markets: Proverbial Concerns, Novel Evidence.” *IMF Working Paper* No. 2024/093.

De Mello, João Manoel Pinho and Pedro Henrique Rosado de Castro. 2012. “Is the Bank Interest Rate Pass-Through of SELIC Rate Movements Asymmetric?” *Brazilian Review of Econometrics* 32(1): 3–30.

De Mello, Luiz and Mauro Pisu. 2010. "The Bank Lending Channel of Monetary Transmission in Brazil: A VECM Approach." *The Quarterly Review of Economics and Finance* 50(1), 50-60.

Divino, Jose Angelo and Carlos Haraguchi. 2023. "Observed and Expected Interest Rate Pass-Through under Remarkably High Market Rates." *Empirical Economics* 65(1): 203-246.

Elias, Laura and Bernardo Guimaraes. 2024. “This is not America: The Credit Channel of Monetary Policy in Brazil.” *Economía* 23(1): 137–174.

Gigineishvili, Nikoloz. 2011. "Determinants of Interest Rate Pass-Through: Do Macroeconomic Conditions and Financial Market Structure Matter?" *IMF Working Paper* No. 2011/176.

Greenwood-Nimmo, Matthew, Daan Steenkamp, and Rossouw van Jaarsveld. 2024. “A Bank-Level Analysis of Interest Rate Pass-Through in South Africa”, *Journal of Macroeconomics* 82, 103639

Gregor, Jiří, Aleš Melecký, and Martin Melecký. 2021. "Interest Rate Pass-Through: A Meta-Analysis of the Literature." *Journal of Economic Surveys* 35(1): 141-191.

Hristov, Nikolay, Oliver Hülsewig, and Timo Wollmershäuser. 2014. “The Interest Rate Pass-Through in the Euro Area during the Global Financial Crisis.” *Journal of Banking and Finance* 48:104–119.

Hsu, Chris C. 2017. “The Interest Rate Pass-Through: An Empirical Study of Seven Asian Economies.” *Global Journal of Business Research* 11 (2): 1-10.

Jordà, Òscar. 2005. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review* 95(1): 161-182.

Jordà, Òscar, and Alan M. Taylor. 2025. "Local Projections." *Journal of Economic Literature* 63(1): 59-110.

Maravalle, Alessandro and Alberto González Pandiella. 2022. "The Pass-Through of the Monetary Policy Rate into Lending Rates in Mexico." *OECD Economics Department Working Papers* No. 1734

Mishra, Prachi and Peter Montiel. 2013. “How Effective is Monetary Transmission in Low-Income Countries? A Survey of the Empirical Evidence.” *Economic Systems* 37(2): 187–216.

Mishra, Prachi, Peter Montier, Peter Pedroni, and Antonio Spikimbergo. 2014. “Monetary Policy and Bank Lending Rates in Low-Income Countries: Heterogeneous Panel Estimates.” *Journal of Development Economics* 111: 117–131.

Nakamura, Emi and Jón Steinsson. 2018. “High-Frequency Identification of Monetary Non-Neutrality: The Information Effect.” *The Quarterly Journal of Economics* 133(3): 1283-1330.

Prabheesh, K.P.; Solikin M. Juhro, and Cicilia A. Harun. 2021. "Covid-19 Uncertainty and Monetary Policy Responses: Evidence from Emerging Market Economies," *Bulletin of Monetary Economics and Banking*, Bank Indonesia 24(4): 489-516.

Ramey, Valerie A. 2016. “Macroeconomic Shocks and Their Propagation.” Handbook of Macroeconomics, edited by Taylor, John B. and Harald Uhlig, volume 2, chapter 2, 71–162. Amsterdam: Elsevier.

Ramey, Valerie A. and Sarah Zubairy. 2018. “Government Spending Multipliers in Good Times and in Bad: Evidence from US Historical Data.” *Journal of Political Economy* 126(2): 850–901.

Stock, James H. and Mark W. Watson. 2018. “Identification and Estimation of Dynamic Causal Effects in Macroeconomics Using External Instruments.” *Economic Journal* 128(610): 917–948.

Takeda, Tony, Fabiana Rocha, and Márcio I. Nakane. 2005. "The Reaction of Bank Lending to Monetary Policy in Brazil." *Revista Brasileira de Economia* 59(1): 107-126.

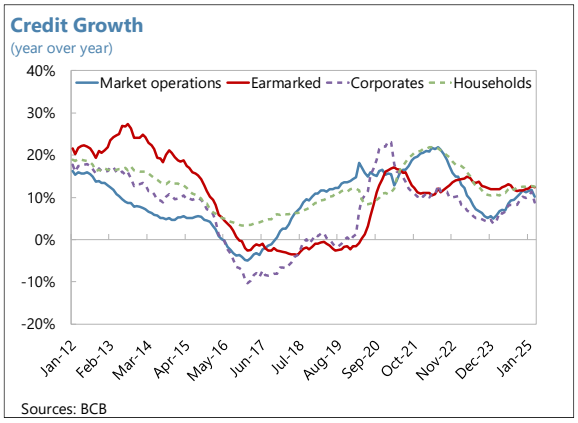
Wang, Yifei, Toni M. Whited, Yufeng Wu, and Kairong Xiao. 2022. “Bank Market Power and Monetary Policy Transmission: Evidence from a Structural Estimation,” *The Journal of Finance* 77(4): 2093-2141.

Weth, Mark A. 2002. "The Pass-Through from Market Interest Rates to Bank Lending Rates in Germany." *Discussion Paper Series 1: Economic Studies* 11, Deutsche Bundesbank.

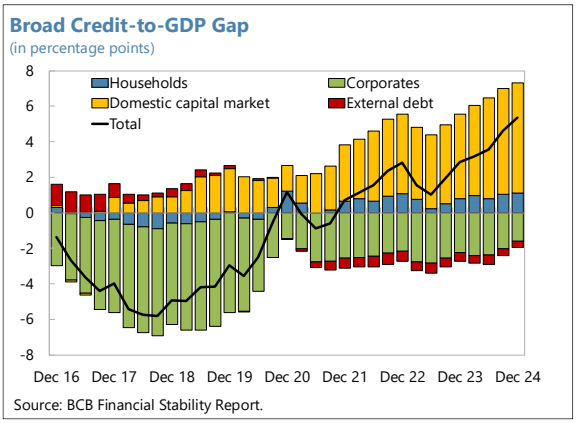
Xu, Rui. 2025. “Fintech Competition and Banks’ Shrinking Margins in Brazil.” IMF Working Paper, Forthcoming.

**Figure 1. Brazil's Credit Market: Stylized Facts**

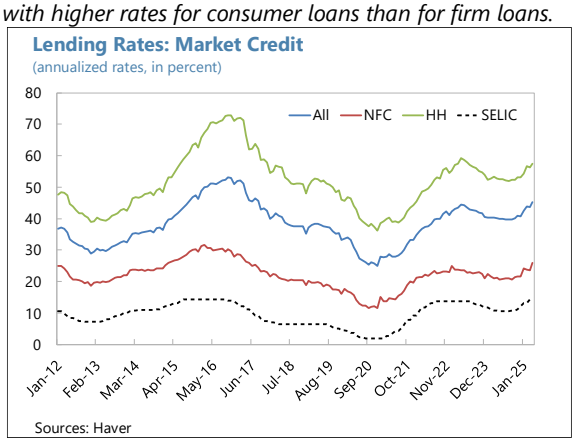
*Credit growth remains strong.*



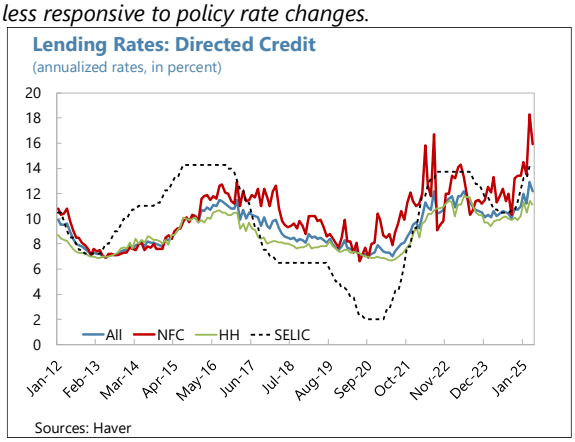

*The domestic bond market is raising the credit gap.*



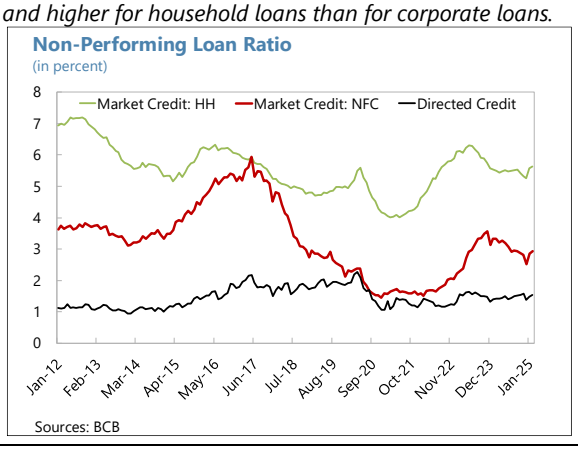

*Lending rates for market credit are around 50 percent, with higher rates for consumer loans than for firm loans.*




*Lending rates on government-directed credit are lower and less responsive to policy rate changes.*




*NPL ratios are higher for market than for directed credit, and higher for household loans than for corporate loans.*




*After the reform in 2018, BNDES funding rates are more aligned with SELIC rates.*

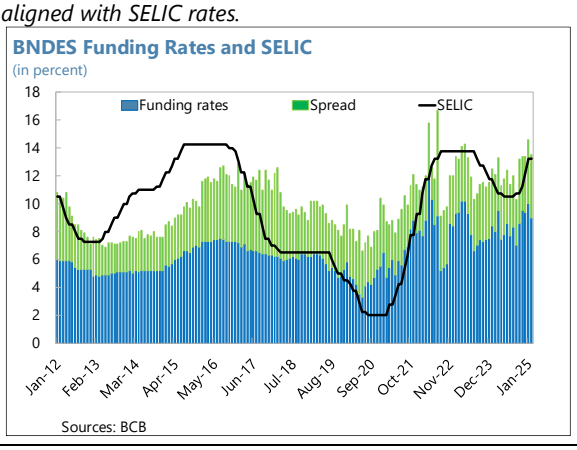
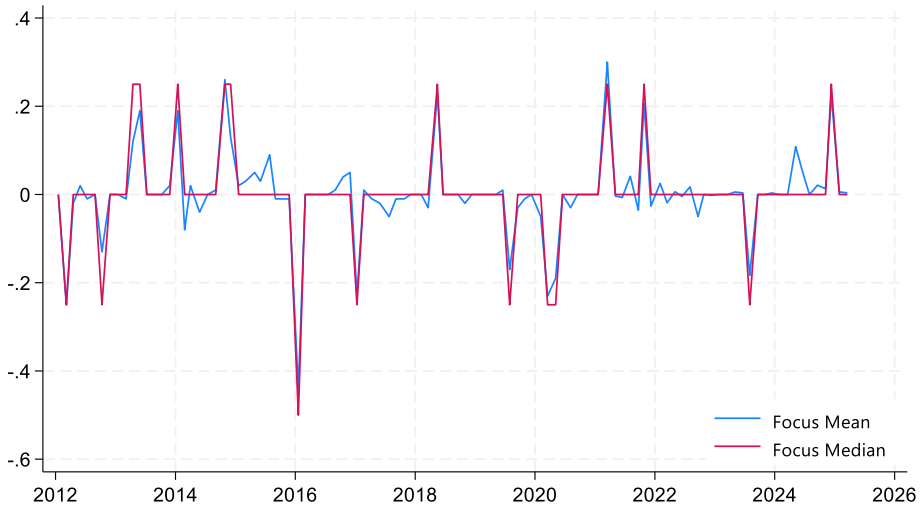


**Figure 2. Monetary Policy Shocks**
(percentage points)




Source: IMF Staff Calculation.

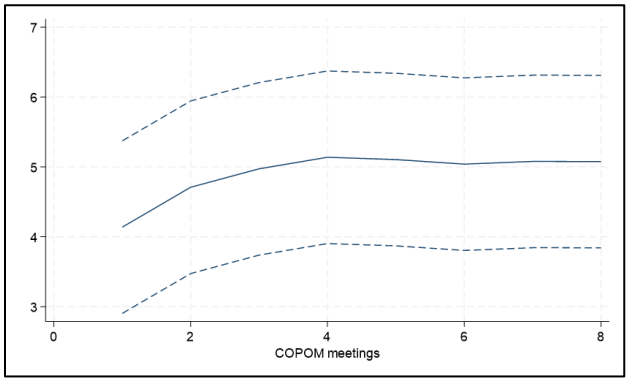
**Table 1. Summary Statistics: Bank Lending Rates**

| Original loan types | Preferred Grouping | N | Mean | SD | Min | p25 | p50 | p75 | Max |
|---|---|---|---|---|---|---|---|---|---|
| Financing other | Financing | 125159 | 3.7 | 2.1 | 0.2 | 1.8 | 3.6 | 5.3 | 13.4 |
| Financing cars | | 141291 | 1.9 | 0.7 | 0.5 | 1.4 | 1.8 | 2.3 | 5.2 |
| Working capital (<1 year, fixed) | Working capital | 137762 | 2.4 | 1.3 | 0.5 | 1.6 | 2.1 | 2.8 | 20.8 |
| Working capital (<1 year, float) | | 78739 | 1.5 | 0.6 | 0.5 | 1.1 | 1.5 | 1.8 | 12.7 |
| Working capital (>1 year, fixed) | | 124838 | 2.0 | 0.8 | 0.5 | 1.5 | 1.9 | 2.4 | 12.0 |
| Working capital (>1 year, float) | | 88084 | 1.4 | 0.4 | 0.5 | 1.1 | 1.4 | 1.6 | 4.9 |
| Credit Card - financing | Unsecured consumer loans | 121180 | 8.2 | 3.1 | 1.0 | 5.9 | 8.1 | 10.1 | 21.1 |
| Credit Card - revolving | | 123334 | 13.5 | 4.5 | 1.1 | 10.8 | 14.1 | 16.9 | 31.1 |
| Non-payroll loan | | 224142 | 7.1 | 5.1 | 1.0 | 3.1 | 5.1 | 11.0 | 46.9 |
| Discounted trade bills (DTB) | DTB | 156731 | 2.3 | 1.2 | 0.2 | 1.5 | 2.2 | 3.0 | 26.7 |
| Guaranteed overdraft (fixed) | Guaranteed overdraft | 102572 | 3.3 | 1.9 | 1.0 | 2.2 | 2.8 | 3.9 | 14.8 |
| Guaranteed overdraft (float) | | 106824 | 1.8 | 0.6 | 0.5 | 1.5 | 1.8 | 2.1 | 11.8 |
| Pension-deducted loan | Payroll-backed Loans | 119576 | 1.9 | 0.3 | 1.0 | 1.7 | 2.0 | 2.1 | 3.9 |
| Private payroll loan | | 158330 | 2.7 | 0.8 | 1.0 | 2.1 | 2.6 | 3.0 | 8.8 |
| Public payroll loan | | 127991 | 2.0 | 0.9 | 1.0 | 1.6 | 1.8 | 2.1 | 9.0 |

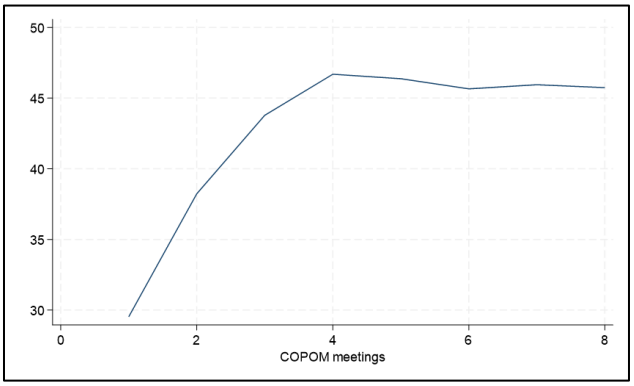
Note: Table reports monthly (non-annualized) interest rates in percent as some of the loans have short maturities. Blue font indicates loans to firms; black font indicates loans to households (excluding mortgages which are government directed credit).

**Figure 3. First Stage: *F*-statistic and Slope Coefficient Estimates**

A. Estimated Slope Coefficient



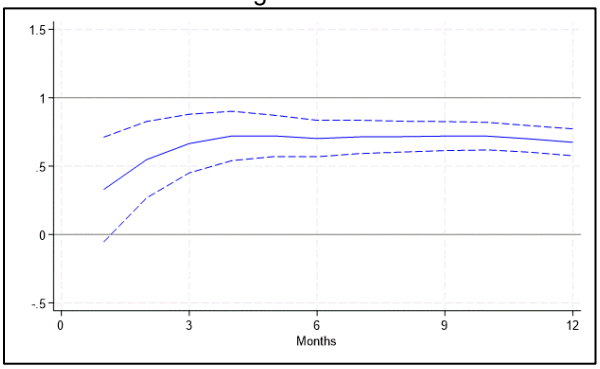

B. *F*-statistic for First Stage



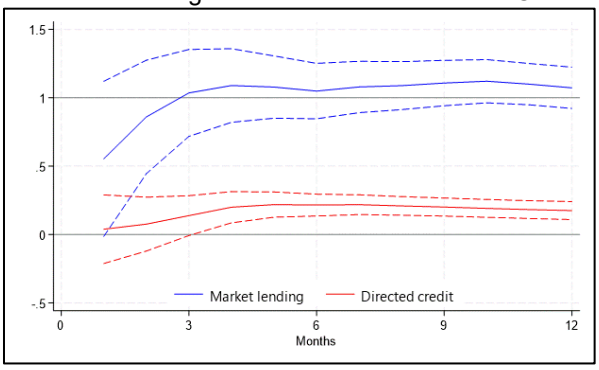

Note: Top panel reports the estimated slope coefficient for the relationship between the cumulative change in the SELIC policy rate and the cumulative monetary policy shock (the instrumental variable) together with 90 percent confidence bands for each horizon in terms of the number of COPOM meetings (there are eight COPOM meetings each year with an average interval of 46 days).

**Figure 4. Aggregate Interest Rate Pass-through**

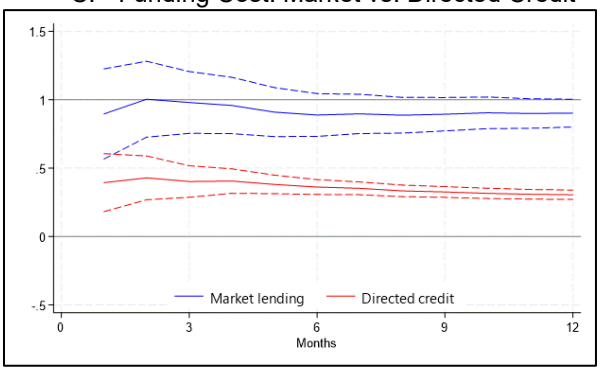
A. Lending Rates: All New Loans




B. Lending Rates: Market vs. Directed Credit



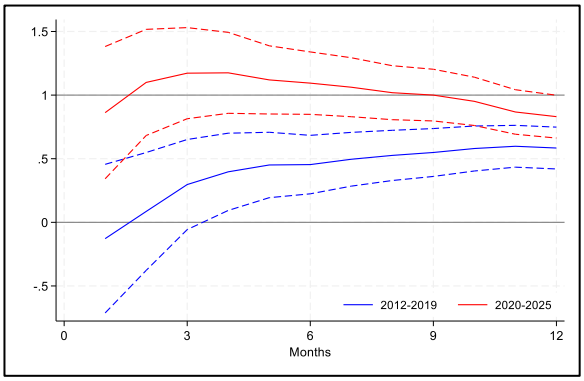

C. Funding Cost: Market vs. Directed Credit



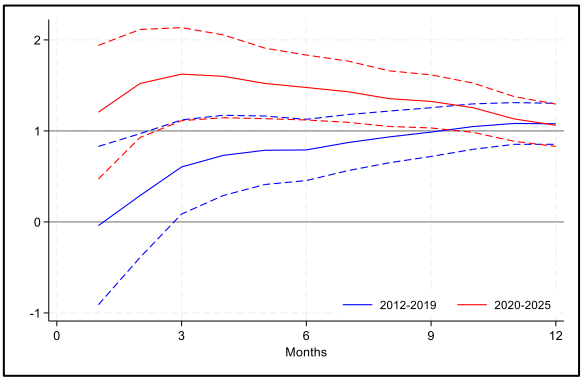

Note: Figure reports estimated responses of lending rates to monetary policy changes together with 90 percent confidence bands.

**Figure 5. Interest Rate Pass-through: 2012-19 vs. 2020-25**

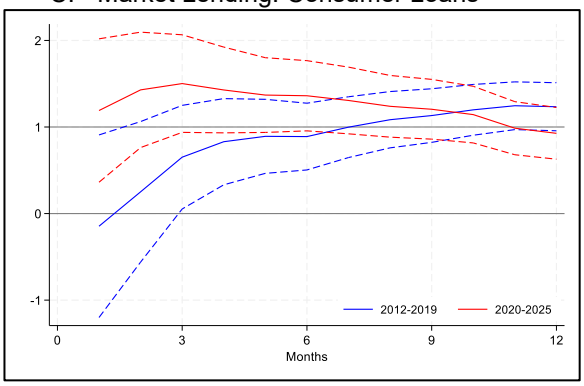
A. All New Loans



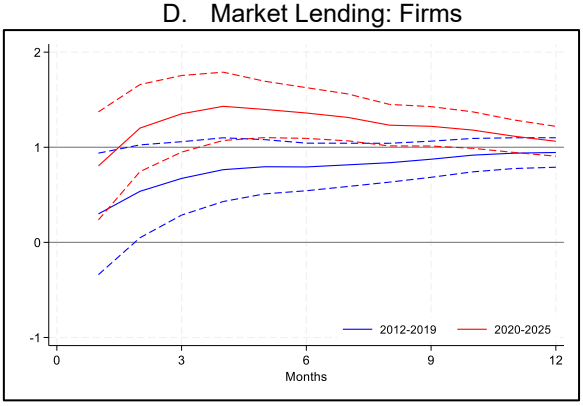

B. Market Lending Operations



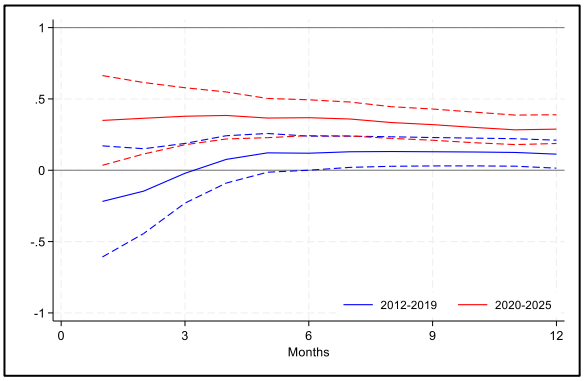

C. Market Lending: Consumer Loans



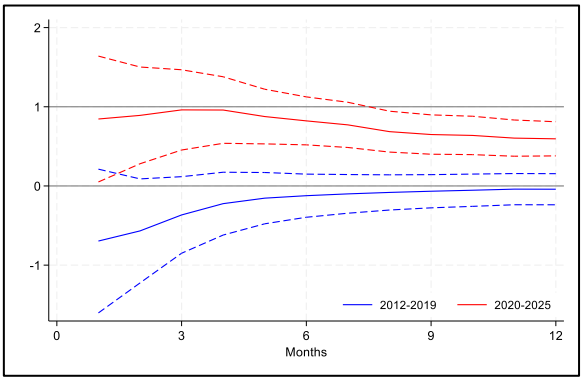

D. Market Lending: Firms




E. Government-Directed Credit



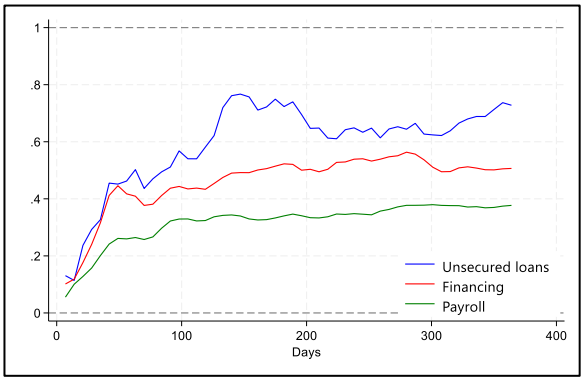

F. Government-Directed Credit: BNDES



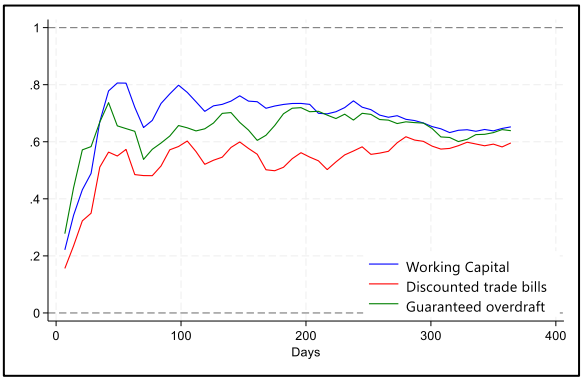

Note: Figure reports estimated responses of lending rates to monetary policy changes together with 90 percent confidence bands.

**Figure 6. Interest Rate Pass-through by Credit Types**

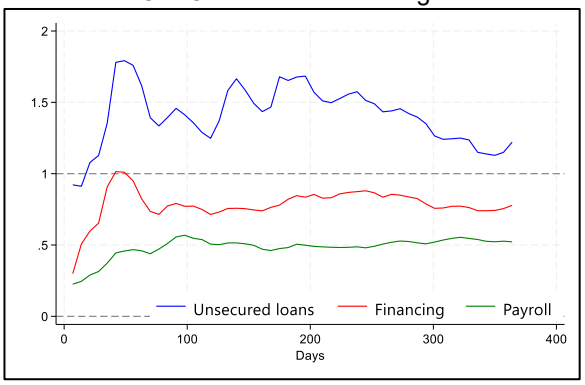
A. Consumer Loans



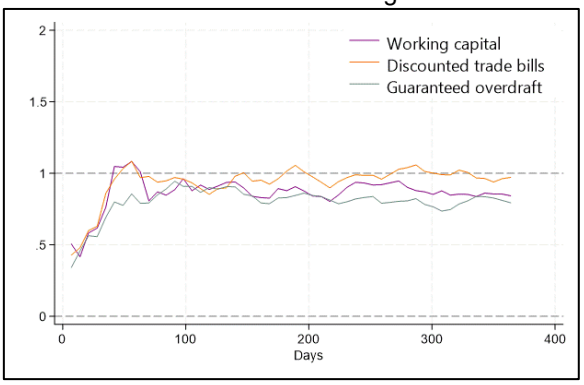

B. Firm Loans



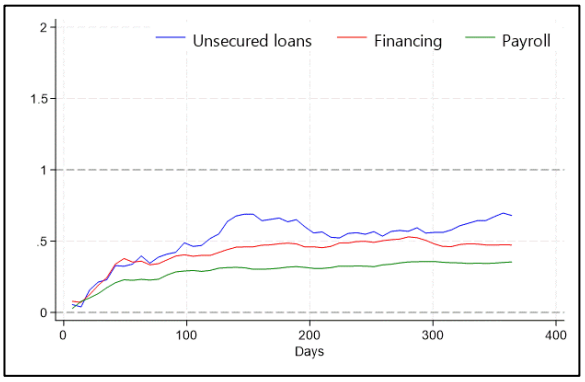

C. Consumer Loans: Big Five



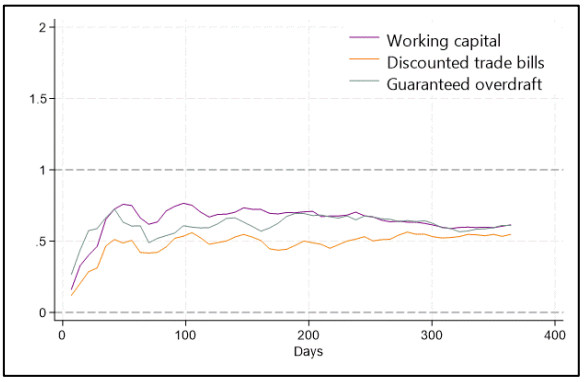

D. Firm Loans: Big Five




E. Consumer Loans: Other Banks



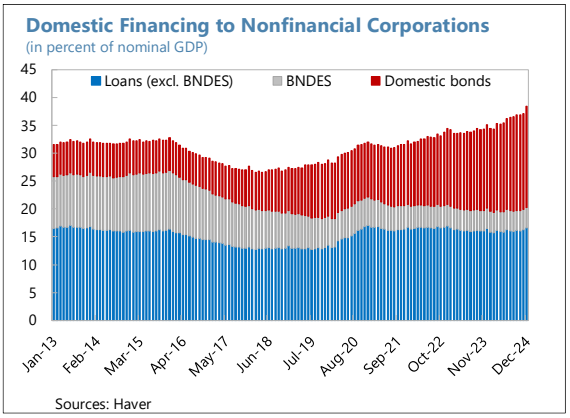

F. Firm Loans: Other Banks



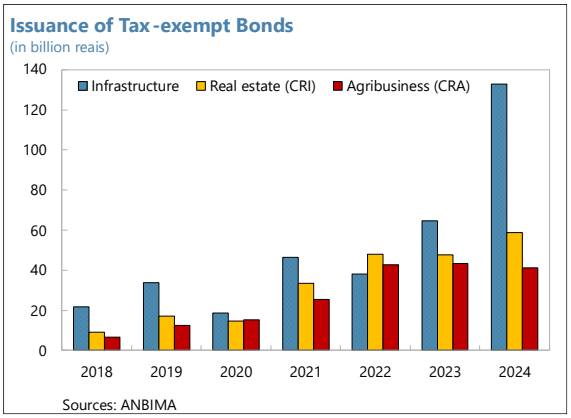

Note: Figure reports estimated responses of daily lending rates to monetary policy changes using bank-level panel data. “Big Five” indicates largest five banks based on loan volume.

**Figure 7. Drivers of Credit Growth**

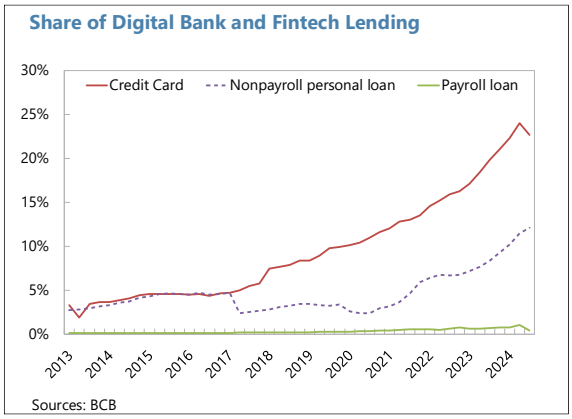
*Firms are increasingly relying on domestic bond market financing.*



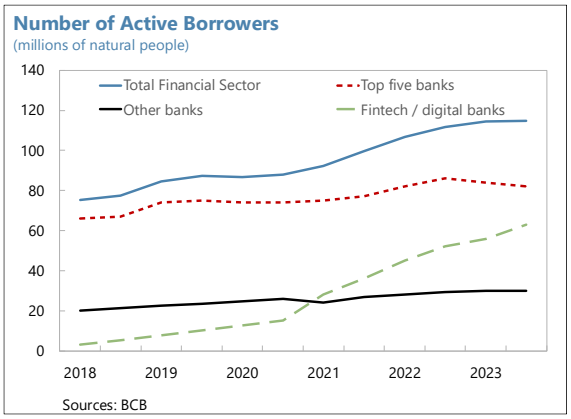

*Issuance of tax-exempt infrastructure bonds surged in 2024.*




*Fintech lending (including digital banks) accounts for one-quarter of credit card loans and 10 percent of nonpayroll personal loans.*




*Financial inclusion has also improved, with fintech making the most contribution.*




PUBLICATIONS