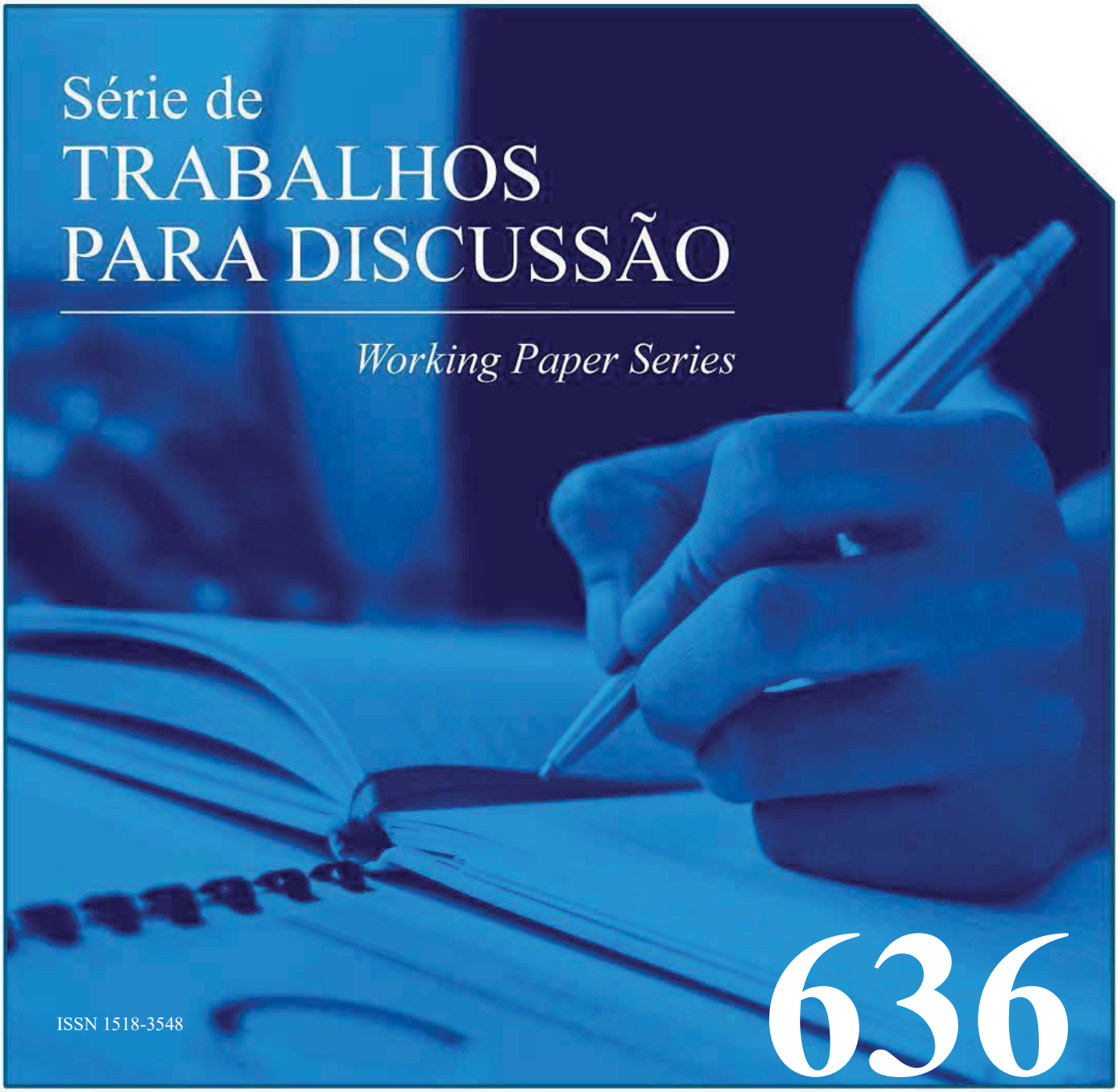

Dezembro 2025

The Nuanced Role of Government Credit on Monetary Policy Transmission

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BANCO CENTRAL DO BRASIL

ISSN 1518-3548
CGC 00.038.166/0001-05

Working Paper Series	Brasília	no. 636	Dezembro	2025	p. 3-40

Working Paper Series

Edited by the Research Department (Depep) – E-mail: workingpaper@bcb.gov.br

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Non-Technical Summary (NTS)

This study investigates how government credit programs affect the transmission of monetary policy in Brazil, focusing on the period 2011–2016—a time of significant government intervention in credit markets. Using detailed loan-level data from the Central Bank of Brazil, the research examines two types of government intervention: direct lending by government banks and earmarked credit, which refers to government-subsidized credit delivered through private banks. Special attention is given to credit extended to small and medium-sized enterprises (SMEs). Main findings are:

1. **Government direct credit shields SMEs**: During periods when the central bank raises interest rates (monetary tightening), loans provided directly by government banks offer SMEs lower borrowing costs than they would otherwise face. This acts as a buffer, supporting the government's developmental goals by maintaining access to finance for SMEs. However, it also dampens the intended impact of monetary tightening on slowing credit growth, reducing the overall effectiveness of monetary policy transmission.
2. **Earmarked credit and lending relationships**: With government-subsidized credit via private banks, the impact of monetary policy on loan rates depends on the borrower's relationship with the bank. Longer-term clients see larger interest rate hikes on their subsidized loans when policy rates rise, and smaller rate cuts when policy rates fall, compared with newer clients. This suggests that the benefit of subsidized credit is uneven—longstanding clients may face higher costs during monetary tightening and less relief during monetary easing.
3. **Cross-subsidization by banks**: Banks often use low-interest subsidized loans to "lock in" clients, then charge those same clients higher rates on regular (non-subsidized) loans when monetary policy tightens. This cross-subsidization can dilute the net benefits of government programs for borrowers and may distort competition in the credit market.
4. **Policy trade-offs**: Government credit programs can help stabilize priority sectors and support economic recovery but entail important trade-offs. By shielding parts of the economy, these interventions can weaken the transmission of monetary policy and introduce inefficiencies in credit allocation. The diverse effects across credit types and borrower relationships mean that policymakers must carefully design credit programs to balance developmental goals with the effectiveness of monetary policy.

To conclude, government credit interventions in Brazil acts as a double-edged sword: they provide crucial support to targeted firms—especially SMEs—during periods of tight monetary policy, but at the cost of weakening the broader impact of monetary policy on the credit market. These nuanced effects highlight the importance of designing government credit programs to balance developmental objectives with the need to preserve monetary policy effectiveness.

Resumo Não Técnico (Português)

Este estudo investiga como programas de crédito governamentais afetam a transmissão da política monetária no Brasil, com foco no período de 2011–2016 — um momento de significativa intervenção governamental nos mercados de crédito. Utilizando dados de créditos do Banco Central do Brasil, a pesquisa examina dois tipos de intervenção governamental: concessão direta de crédito por bancos públicos e crédito direcionado, que se refere ao crédito subsidiado pelo governo e operacionalizado por bancos privados. Os principais achados são:

1. **Crédito direto do governo protege PMEs**: Durante períodos em que o Banco Central eleva as taxas de juros, os empréstimos concedidos diretamente por bancos públicos oferecem às PMEs custos de financiamento mais baixos do que teriam no mercado. Isso atua como um amortecedor, apoiando os objetivos de desenvolvimento do governo ao manter o acesso ao crédito para PMEs. Contudo, também reduz o impacto pretendido do aperto monetário, diminuindo a eficácia geral da transmissão da política monetária.
2. **Crédito direcionado e relações bancárias**: Nos programas de crédito subsidiado via bancos privados, o impacto da política monetária sobre as taxas dos empréstimos depende da relação do tomador com o banco, sugerindo que o benefício do crédito subsidiado é desigual. Clientes de longo prazo enfrentam aumentos maiores nas taxas de seus empréstimos subsidiados quando as taxas básicas sobem e reduções menores quando elas caem, em comparação com clientes novos.
3. **Cross-subsidização pelos bancos**: Os bancos frequentemente usam crédito subsidiado de baixo custo para "reter" clientes, cobrando desses mesmos clientes taxas mais altas em empréstimos não subsidiados quando a política monetária aperta. Essa prática pode diluir os benefícios dos programas governamentais para os tomadores e distorcer a concorrência no mercado de crédito.
4. **Dilemas de política pública**: Programas de crédito governamental podem ajudar a estabilizar setores prioritários e apoiar a recuperação econômica, mas implicam importantes trade-offs. Ao proteger partes da economia, essas intervenções podem enfraquecer a transmissão da política monetária e introduzir ineficiências na alocação do crédito. Os efeitos entre tipos de crédito e relações bancárias sugerem que os formuladores de políticas devem desenhar cuidadosamente os programas para equilibrar objetivos de desenvolvimento com a eficácia da política monetária.

Conclusão: As intervenções de crédito do governo no Brasil funcionam como uma faca de dois gumes: fornecem suporte crucial a empresas-alvo durante períodos de política monetária restritiva, mas ao custo de enfraquecer o impacto mais amplo da política monetária sobre o mercado de crédito. Esses efeitos ressaltam a importância de desenhar programas públicos de crédito que equilibrem objetivos de desenvolvimento com a necessidade de preservar a eficácia da política monetária.

The Nuanced Role of Government Credit on Monetary Policy Transmission

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Abstract

We investigate the role of government credit in monetary policy transmission, using detailed credit registry data from Brazil. We find that government direct credit can effectively support small and medium-sized enterprises (SMEs) in a tight monetary policy environment, aligning with developmental objectives. But it comes at the cost of diminishing the overall effectiveness of monetary policy transmission. We also uncover complexities introduced by government-subsidized lending, where the impact of monetary policy transmission is influenced by factors such as credit market segments, lending relationships, and prevailing monetary policy conditions. These insights provide valuable guidance for policymakers on the transmission of monetary policy and the trade-offs involved in government credit programs.

JEL-Codes: E44, E51, E52, E58, G21, G28

Keywords: Monetary policy, government banks, government direct credit, earmarked credit, SME, emerging market, Brazil

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We thank Rodrigo Barbone Gonzalez, Jon Frost, Linda Goldberg, Daniel Leigh, Sole Martinez Peria, Rodrigo Valdes, and participants at the 2020 IMF Annual Macrofinancial Research Conference, 2023 AEA meetings, 2024 CEMLA Conference, and research seminars at the BIS, IMF, and Technical University of Munich for valuable comments and discussions. The views expressed here are ours and do not reflect those of the Banco Central do Brasil, IMF and its Executive Board, IMF management, or the World Bank Group.

1 Introduction

In times of economic downturn and crisis, governments often turn to credit programs as a lifeline for struggling businesses and households, seeking to stabilize the economy and support recovery. Yet, as policymakers deploy such measures alongside monetary policy interventions, their broader implications remain underexplored. This paper examines the impact of government credit on the transmission of monetary policy, investigating the channels through which this influence operates. This inquiry is especially pertinent given the aftermath of recent global crises, including the COVID-19 pandemic and the Global Financial Crisis (GFC), during which credit programs played a central role in economic recovery.

Although substantial research has been devoted to understanding how monetary policy affects bank credit (e.g., Bernanke and Blinder, 1992; Bernanke and Gertler, 1995; Kashyap and Stein, 2000), an important and underexplored area remains the role of government credit in monetary policy transmission. There are two primary perspectives on the role of government credit, each with different implications for the effectiveness of monetary policy transmission. The "developmental view" posits that government banks and credit support can catalyze financial and economic development in countries with weak institutions, where private banks may be less effective in implementing long-term credit policies (King and Levine, 1993; King and Levine, 1998; Rajan and Zingales, 1998). In contrast, the "political view" suggests that government intervention in credit markets can lead to inefficiencies, misaligned incentives, and corruption (Sapienza, 2004; Khwaja and Mian, 2005; Claessens et al., 2008; Cole, 2009; Dinc and Gupta, 2011; Dinc, 2005; Carvalho, 2014). This view aligns with findings from Jiménez et al. (2012), which document how weaker banks exhibit greater credit tightening under monetary contraction, highlighting potential inefficiencies in credit allocation.

Consequently, the transmission of monetary policy could be either strengthened, if government involvement addresses structural weaknesses and enhances the credit market's responsiveness to changes in monetary conditions, or weakened, if it distorts credit allocation. Thus, understanding the impact of large-scale government-directed lending on monetary policy transmission is a crucial empirical question.

The variety of government credit interventions adds another layer of complexity to this investigation. Governments typically allocate credit through two main approaches: direct lending by government banks (i.e., government direct credit) and government-subsidized lending (i.e., earmarked credit). In the first approach, government banks provide credit directly to households and businesses, often targeting specific sectors or groups. In the second approach, governments subsidize or mandate private banks to lend to designated sectors or groups.[1]

These considerations motivate our three research questions. First, does government direct credit facilitate the transmission of monetary policy through a direct pass-through of loan interest rates? Sec-

[1] Although beyond the scope of this paper, it is worth noting that guaranteed credit represents another method of government influence, where private banks lend but governments guarantee a portion of the loan against default.

ond, how effective is the monetary policy transmission through earmarked lending mediated by private banks? Third, do private banks adjust the interest rates of non-earmarked credit, thereby affecting the transmission of monetary policy through non-earmarked credit? We refer to non-earmarked credit as loans issued by banks independently, without special funding or directives from government credit programs.

Our analysis is based on detailed credit registry information from Brazil, which provides an ideal setting to examine the role of government credit on monetary policy transmission. Brazil has extensively used both government direct credit and earmarked credit, forming two pillars of its credit strategy. Following the GFC, large-scale government interventions in the credit market were employed alongside monetary policy measures to bolster the economy. This is particularly evidenced in the period 2011–2016, which saw a significant surge in government credit.

Our findings reveal a complex and variable role of government credit in monetary policy transmission, highlighting the distinct dynamics at play for different credit segments and monetary policy conditions. We have three main findings.

First, we find that the pass-through of monetary policy shocks is significantly smaller for government direct credit to small and medium enterprises (SMEs) during periods of monetary policy tightening. This is indicative of the subsidy provided to SMEs through lower interest rates during periods of monetary policy tightening. This helps reduce borrowing costs for SMEs when interest rates rise and overall credit supply is limited. It aligns with the developmental role of government credit in supporting SMEs by alleviating their financing costs. During the loosening period, in contrast, there is no evidence of different pass-through of government direct credit. When monetary conditions loosen and borrowing costs generally decline, the relevance of the government's credit subsidy diminishes.

Second, among private bank credit, the pass-through of monetary policy shocks via earmarked credit depends on lending relationship. A longer earmarked lending relationship is associated with a stronger pass-through during periods of monetary policy tightening. One interpretation is that banks are able to pass credit costs more effectively to their "locked-in" long-term clients as they have greater dependence on earmarked credit. Additionally, we find that the impact of a longer earmarked relationship on earmarked credit is more pronounced for SMEs compared to large firms, likely reflecting SMEs' more limited credit access and higher dependence on earmarked loans than large firms. Furthermore, we observe evidence of asymmetry with respect to monetary policy conditions as a longer earmarked relationship is associated with a weaker pass-through during loosening periods. One possible explanation is that when monetary conditions are loosening, access to low-cost earmarked credit becomes less valuable for the long-term clients.

Third, we find evidence of cross-subsidization between earmarked and non-earmarked credit for large firms during tightening periods. Having an earmarked relationship is associated with a significantly stronger pass-through of monetary policy shock to private banks' non-earmarked credit for large firms. One interpretation of this result is that banks are able to "lock in" clients by offering them lower-

cost earmarked loans. They can then capture the rent from the earmarked relationship by passing higher loan costs more effectively to these locked-in clients through non-earmarked loans.

We interpret our findings as evidence of a complex and variable role of government credit. Government direct credit offers relatively lower-cost financing to SMEs in a tight monetary environment, aligning with the developmental role of government credit in alleviating financing costs for SMEs. But this comes at the cost of reducing the overall effectiveness of monetary policy transmission. The role of earmarked credit is more complex. The fact that the pass-through depends on lending relationship and monetary policy conditions highlights the varying role earmarked credit plays in monetary policy transmission. Finally, our results provide some evidence of cross-subsidization between earmarked and non-earmarked credit, pointing to inefficiencies in the credit market.[2]

Our empirical strategy addresses key challenges in identifying the role of government credit in monetary policy transmission. First, we need to disentangle the role of government credit from private credit supply and demand factors. When monetary policy is tightened, private credit supply may decrease due to increased funding costs for banks, while demand may also fall because credit becomes more expensive. Additionally, firms more affected by changes in financial conditions might borrow more from banks that are more responsive to monetary policy actions, creating an omitted variable bias. Second, we must separate the effect of monetary policy from that of economic conditions, as monetary policy tightening often responds to a widening positive output gap. This responsiveness makes it difficult to distinguish the effects of monetary policy from those of the economic backdrop and outlook.

We address these challenges by exploiting variations across different types of credit over time by bank, firm, and bank-firm pair. Utilizing the granularity of the credit registry dataset, we control for time-varying observed and unobserved firm heterogeneity with firm-time fixed effects, thus suppressing the credit demand channel. We control for bank-firm relationships with bank-firm fixed effects to mitigate concerns about non-random matching between banks and firms. In the tightest specification, we also control for time-varying observed and unobserved bank heterogeneity with bank-time fixed effects, thus also suppressing the credit supply channel.

Our key contribution to the literature is offering a new perspective on how government credit interacts with the broader credit market in the transmission of monetary policy. We highlight important considerations for policymakers regarding the trade-offs of government credit programs, particularly in terms of their developmental goals of supporting specific sectors and the overall effectiveness of monetary policy transmission. Moreover, the role of government credit in monetary policy transmission is complex and depends on factors such as credit market segments, lending relationships, and monetary policy conditions.

The paper adds to the literature along three dimensions. First, we provide evidence that government credit is a crucial factor in the transmission of monetary policy. Surprisingly, while the role of foreign

[2]In 2018, the government introduced a new market-based benchmark rate for earmarked loans with the goal to reduce subsidies to earmarked loans. See Section 2.2 for more detail.

banks in monetary policy transmission has been extensively studied (see Morais et al., 2019 and the references therein, as well as Dwarkasing et al., 2016, for a general review of the literature on the bank lending channel of monetary policy), there is limited work on the role of government presence in credit markets for the transmission mechanism. Our results suggest that government credit is an important supply-side factor for monetary policy transmission, not only through direct credit provision but also through its influence on the credit relationships of private banks that intermediate government credit. These channels complement channels identified by the literature.

Second, we contribute to the policy-oriented literature on government intervention in credit markets. Direct lending and government-sponsored lending are important policy tools in many countries, yet the literature has not systemically assessed their role in monetary policy transmission. For example, U.S.-based literature has analyzed the similarities between government-sponsored housing credit programs and fiscal policy (Lucas, 2016) and examined government-sponsored entities' securitization and lending activities in response to higher policy rates (Pescatori and Sole, 2016). Additionally, the introduction of unconventional monetary policy has spurred research on the implications of asset purchases for credit allocation (Maggio et al., 2020). In Brazil, the literature has examined the effect of government credit on relationship lending (Ornelas et al., 2022), employment (Carvalho, 2014), and credit allocation (Bonomo et al., 2015; Carvalho, 2014). Studies on government bank and monetary policy pass-through show mixed evidence. For example, Coelho et al. (2010) and Leigh and Xu (2025) find no evidence of different degrees of pass-through of policy rate surprises between government and private banks. Similarly, Divino and Haraguchi (2023) find no difference in the pass-through of the policy rate or in professional forecasters' expectations of the policy rate. In contrast, Pereira and Maia-Filho (2013) show that government banks exhibited weaker pass-through of the policy rate than private banks before the Global Financial Crisis, but no difference between the two afterwards. These varying results may be explained by differences in data samples and empirical methodologies. Leigh and Xu (2025) find that, in the aggregate, earmarked credit has weaker pass-through than non-earmarked credit.[3] Our paper differs from these studies in important aspects. We use bank-firm match data—absent in aforementioned papers—to disentangle the role of government credit from private credit supply and demand factors. Like Coelho et al. (2010) and Leigh and Xu (2025), we exploit monetary policy shocks to isolate exogenous variation in policy rate, unlike Pereira and Maia-Filho (2013) and Divino and Haraguchi (2023) who focus on policy rate level or its expectations. More importantly, to the best of our knowledge, we are the first to examine whether earmarked credit by private banks has spillover effects on the pass-through of monetary policy to their non-earmarked credit.

Third, we contribute to the literature on banking relationships. We find that borrowing from banks

[3]The sample period is 2000-2006 in Coelho et al. (2010), 2008-2010 in Pereira and Maia-Filho (2013), 2012-2019 in Divino and Haraguchi (2023), and 2012-2025 in Leigh and Xu (2025). The Pereira and Maia-Filho (2013) sample includes two large government banks and two large private banks, while the Coelho et al. (2010) and Divino and Haraguchi (2023) samples include loans to non-financial corporations. The Leigh and Xu (2025) sample include loans to individuals and firms.

that intermediate government credit has different implications for credit costs depending on whether the loan is under the government program or not and on the type of past lending activity between the bank and the firm. This finding complements the existing literature on how banking relationships affect credit outcomes (Petersen and Rajan, 1994; Degryse and Van Cayseele, 2000). It also highlights the role of banking relationships in monetary policy transmission, a topic that has so far been little explored.

The rest of the paper is organized as follows. Section II provides background on the Brazilian credit markets, focusing on the role played by the government. Section III describes the data used in the analysis and presents the empirical strategy. Section IV presents the results. Section V concludes.

2 Institutional Background

2.1 Monetary Policy

The Central Bank of Brazil introduced an inflation-targeting framework in 1999. The inflation target, comprising a midpoint and a tolerance interval, is set annually by the National Monetary Council based on the Broad National Consumer Price Index (IPCA).[4] The primary instrument of monetary policy is the Special System for Settlement and Custody (SELIC) rate, an average of interest rates on overnight interbank credit backed by federal government securities. The Monetary Policy Committee (Copom) of the Central Bank sets the SELIC rate target every 45 days following a two-day meeting, with open market operations conducted to maintain the daily effective rate close to the target.

The inflation-targeting framework in Brazil has achieved notable success. It has contributed to reducing inflation and likely helped macroeconomic stability during periods of economic turmoil, such as in 2001–2002 (Giavazzi et al., 2005). Real interest rates have also declined, although they remain relatively high compared to global standards. Although economic growth has been slower, its volatility has decreased (Arestis et al., 2008).

2.2 Credit Policy

Government ownership of banks (Porta et al., 2002) and government-sponsored credit programs (Beck et al., 2010) are prevalent throughout the world, with Brazil serving as a notable example of significant government involvement in the credit market. In Brazil, government credit is disbursed through two primary channels: direct credit from government banks and indirect credit via government lending programs, known as earmarked credit. Firms seeking direct credit apply to government banks, which evaluate projects and negotiate loan terms directly. These loans are typically tied to specific investment projects of significant size. The largest government bank in Brazil is the Brazilian National Development Bank (BNDES), established in the 1950s to foster long-term investment in strategic industries.

[4]Throughout, we use the acronyms based on the original Portuguese terms.

During our sample period (2011–16), loans issued by BNDES were remunerated by the Long-Term Interest Rate (TJLP), determined on a quarterly basis by the National Monetary Council (CMN) based on inflation targets. Although the TJLP serves as a benchmark, government banks like BNDES have discretion in setting loan terms, subject to negotiation and varying based on project specifics.[5]

Earmarked credit consists of subsidized loans provided through government programs designed to stimulate investment, export, agriculture, and other objectives. The largest such program is the Investment Support Program (PSI), established in 2009 and operated by BNDES. This program has gained significant popularity among SMEs, with more than half of the total disbursements being allocated to them. Earmarked credit can be directly granted by government banks or intermediated through private banks. In the latter case, firms apply to the intermediary bank, with some applications automatically approved if they meet predetermined eligibility criteria. For other applications, the intermediary bank screens the borrowers and negotiates loan terms, bearing the credit risk. Although funding comes from government sources at subsidized rates, private banks can add an interest rate spread to account for credit risk, with total interest rates capped by program-specific limits. Consequently, interest rate variations reflect both the subsidized benchmark rate and the firm- or project-specific risk. That said, subsidized funding and interest rate limits typically result in lower interest rates for earmarked credit compared to non-earmarked credit. For instance, in June 2016, the average interest rates for earmarked and non-earmarked credit for corporations were 11.7 percent and 30.6 percent, respectively. The interest rate spread, measured as the difference between the lending rate and the funding rate, was 18.3 percent for non-earmarked credit and 4.7 percent for earmarked credit.[6]

During our sample period of 2011-16, large-scale government interventions in the credit market were used in conjunction with monetary policy to support the economy. The Brazilian economy, thanks to the buffers built during the commodity boom years in the run-up to the GFC, weathered the crisis relatively well. Increased public spending and lower interest rates provided the stimulus needed to swing the economy from a 0.9 percent contraction in 2009 to a 7.5 percent expansion in 2010, riding the strong recovery in commodity prices. However, the recovery stalled by mid-2011, driven by falling commodity prices and the tightening in global financial conditions. Growth disappointed at 2.7 percent in 2011. The weaker economic prospects drove a wave of large government interventions in the credit market, concurrent with monetary policy easing. Direct lending by government banks and earmarked credit were two pillars of this intervention. According to aggregate statistics reported by the Central Bank, government bank credit accounted for approximately 42 percent of total credit in early 2011. By the end of 2015, this share had risen to around 56 percent. Earmarked credit as a share of total credit to non-financial corporations was 47 percent in early 2011 and 51 percent in end-2015. Private banks played a significant role in the earmarked credit market, originating nearly 40 percent of the outstanding

[5] In 2018, BNDES retired TJLP and introduced a new market-based rate called the Taxa de Longo Prazo (TLP), which is based on a consumer price index and a spread derived from five-year government bond yields.

[6] Source: Central Bank of Brazil, https://www.bcb.gov.br/conteudo/home-en/FAQs/FAQ%2001-Interest%20Rates%20and%20Bank%20Spreads.pdf

earmarked credit to firms by 2016.

3 Data and Empirical Strategy

3.1 Data

We use an administrative dataset from the Central Bank of Brazil, which contains detailed loan-level information and captures the credit relationships between banks and firms. This dataset is sourced from a comprehensive credit registry that includes loans above certain thresholds granted by various financial institutions operating in Brazil, including government banks, private domestic banks, and foreign banks.[7] The credit registry serves as both a screening and monitoring tool for financial intermediaries and a supervisory device for the Central Bank.

This dataset provides valuable insights into the dynamics of bank-firm credit relationships in Brazil, allowing us to examine loan characteristics, borrower profiles, interest rates, and loan performance metrics. Each observation in the dataset corresponds to a loan and contains information on the contracted interest rate, the loan amount, its maturity, risk rating, and the borrower's background (industry, location, and size as proxied by the number of workers).

Our sample period ranges from September 2011 to September 2016, covering the introduction of the new credit registry in 2011, which mandates reporting of information such as funding sources and firm sizes. This period predates significant alterations in credit programs, including BNDES's operational policy changes in 2017 and the TLP reform in 2018. It is marked by a notable expansion of government credit programs as economic growth stalled in mid-2011 following a recovery from the GFC by the second half of 2010. This led to a substantial increase in both government direct credit and earmarked credit. During our sample period, credit by government banks grew faster than private banks and foreign banks. Earmarked credit grew at a similar rate as non-earmarked credit before 2013 and at a higher rate after 2013 (Figures 1 and 2).

During this period, monetary policy was also actively employed in response to the economic cycle. The reduction in the SELIC rate after the crisis was followed by a tightening phase starting in the second half of 2010 as the economy recovered. This trend reversed in late 2011, but monetary policy tightening resumed in early 2013, even though government support for credit remained relatively strong. This significant shift in monetary policy allows us to analyze two distinct sub-periods: a period of monetary policy loosening from September 2011 to March 2013, and a period of monetary policy tightening from April 2013 to September 2016.

Our analysis is based on a 50 percent random sample of firms from the full credit registry data.

[7] The thresholds were 5,000 BRL (about 1,500 USD) before December 2011, 1,000 BRL (about 500 USD) between January 2012 and May 2016, and 200 BRL (60 USD) from June 2016 onwards. We note that this change of threshhold may affect the composition of loans. For example, receivable discounting loans increase their overall presence in the sample after 2012 as they tend to be smaller than working capital loans.

Our sample includes all types of newly originated credit to these firms and comprises approximately 55 million loan-level observations. Of these, 23 percent are loans from government banks, and 77 percent are loans from private banks. Earmarked credit constituted 25 percent of total credit in early 2011 and increased to 32 percent by the end of 2015.

Table 1 provides detailed summary statistics of the full sample. 94 percent of the credit is extended to SMEs, while 6 percent is to large firms. Among the credit extended to SMEs, 25 percent is government direct credit, and 75 percent is private bank credit. For large firms, only 4 percent is government direct credit, with the remaining 96 percent being private bank credit. SME credit has a higher average interest rate than that for large firms (e.g., 47 percent versus 20 percent during the loosening period), although the medians are about the same. Credit to SMEs is also smaller and has lower ratings and shorter maturities on average than credit to large firms.

Tables 2 and 3 present the summary statistics for the sample of private bank credit to SMEs and large firms respectively. Non-earmarked credit represents about 97 percent of the credit to SMEs and 94 percent of the credit to large firms. SME credit has a higher average interest rate than that for large firms (e.g., 27 percent versus 13 percent during the loosening period). Similar to the full sample, credit to SMEs is also smaller and has lower ratings and shorter maturities on average than credit to large firms. SMEs also have, on average, shorter earmarked relationships than large firms.

3.2 The Role of Government Direct Credit

The empirical analysis has two parts. The first examines the role of government direct credit and the second examines the role of earmarked credit. Our main objective in the first part is to investigate whether government direct credit facilitates the transmission of monetary policy through a direct pass-through of loan interest rates.

Our baseline specification is given by equation (1). This is a loan-level regression that relates the interest rate of a new loan in a given month to the one-month lagged policy rate. Specifically,

$$\begin{aligned} y_{lfbct} = \alpha &+ \beta MP_{BR,t-1} I_{b,BR} + \gamma MP_{BR,t-1} I_{b,BR} G_b \\ &+ \gamma MP_{BR,t-1} I_{b,BR} SME_f + \gamma MP_{BR,t-1} I_{b,BR} G_b SME_f \\ &+ \Sigma_c \theta_c X_{c,t-1} I_{bc} + \phi Z_{lt} + \epsilon_{lfbct}, \end{aligned} \tag{1}$$

where l, f, b, and t index loan, firm, bank, and month respectively. c is the country origin of the bank. The dependent variable is the interest rate on the loan, measured in percentage points.[8] The independent

[8] We use the total interest rate. In the case of indexed loans, this is calculated as the sum of base rate (i.e., fixed rate) and the indexing rate. Unlike fixed-rate loans, the interest rate of indexed loans automatically adjusts based on the indexing rate. The indexing rates vary, reflecting among factors, the retail deposit rate, interbank rate, price indices, TJLP, and SELIC. For loans indexed to SELIC, the indexing could result in a mechanical pass-through from the policy rate to loan rate. Beyond the mechanical pass-through, banks may also adjust the base rate at loan issuance to smooth the effects of indexing, particularly in cases where the indexing rates have a short maturity (Vilerts et al., 2025). We leave this issue for future research.

variable $MP_{c,t-1}$ measures the one-month lagged monetary policy in country c to be specified below. $I_{b,c}$ is an indicator variable for the bank's country of origin. G_b is a dummy variable for Brazilian government banks.[9] SME_f is a dummy variable for SMEs. Our focus here is the transmission of domestic monetary policy in Brazil. Nevertheless, we include foreign monetary policy variables to control for the international credit channel of monetary policy, as identified in the literature (Lee and Bowdler, 2019; Morais et al., 2019). To do this, we control for one-month lagged monetary policy of foreign countries whose banks have the largest presence in Brazil, as well as the one-month lagged annual growth rates of their GDPs and CPIs $X_{c,t-1}$, all interacted with the indicator variable for the bank's country origin.[10] Z_{lt} is a vector of loan-level controls including loan amount, collateral, loan ratings, and loan maturity. The loan amount is measured in natural logarithms. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables for the nine categories of loan ratings. The base category is the lowest rating. Loan maturity is the time to maturity measured in months.

We use monetary policy shocks for Brazil estimated by Checo et al. (2024). The shocks are constructed using analysts' forecast errors of policy rate decisions. This approach builds on the literature identifying monetary policy shocks using high-frequency data, with the identification assumption that analysts construct their forecasts by incorporating the endogenous response of monetary policy to economic conditions. Hence, analysts' forecast errors reflect exogenous variation in monetary policy decisions. During our sample period, the average magnitude of the shocks is 0.6 basis points, with a standard deviation of 7.4 basis points. There are 14 monthly observations with a negative shock and 26 monthly observations with a positive shock. The average magnitude of the negative shocks is -6.2 basis points, with a standard deviation of 9.3 basis points, while the average magnitude of the positive shocks is 4.7 basis points, with a standard deviation of 6.4 basis points.

A key identification challenge is that different banks may have borrowers with different characteristics. To address this concern of non-random matching between banks and borrowers, we first saturate our specification with fixed effects at the bank$\times$firm level. This controls for all time-invariant firm heterogeneity and bank heterogeneity, as well as the sticky bank-firm relationship. It allows us to exploit the variation within the same bank-firm pair over time.

In a tighter specification, we also include firm$\times$month fixed effects. This enables us to control for all time-varying firm heterogeneity that may influence the loan interest rate, stemming from firm balance-sheet channels. The identification, therefore, comes from variations in the interest rate of loans offered by government banks and private banks to a given firm in a given month. This specification comes at the cost of a reduced sample because it restricts the sample to firms with more than one

[9]The sample includes all government banks, covering both development banks—such as BNDES and Banco de Desenvolvimento de Minas Gerais (BDMG)—and commercial banks, including Banco do Brasil and Caixa Econômica Federal.

[10]Foreign banks have a moderate presence in Brazil. Credit from foreign banks ranged between 13 to 17 percent of total credit and exhibited a downward trend in our sample period. We control for the monetary policy of three main sources of foreign banks: the Euro Area, the UK, and the US, each measured by the shadow rate. Banks from the Euro Area, the US, and the UK represent respectively 43 percent, 27 percent, and 6 percent of the foreign banks in our sample.

lending bank in a given month (i.e., multiple-bank relationships). While it is comforting that they represent over 70 percent of our loan sample, one concern is that these firms with multiple lending banks may not be representative of all firms. For example, they may be larger and older than firms with a single-bank relationship. To address this, in another specification, instead of using firm×month fixed effects, we use region×industry×month fixed effects to control for shocks to loan demand. The assumption is that demand shocks are common within the narrowly defined region-industry group, rather than being firm-specific. To determine whether differences across specifications are due to unobserved (region-industry or firm-specific) shocks or due to the firm sample, we run the specification with region×industry×month fixed effects twice: first using the full sample, then using only firms with multiple-bank relationships in a given month. In all specifications, we cluster the standard errors at the bank and time level.

In the tightest specification, we additionally include bank×month fixed effects. This enables us to control for all time-varying bank heterogeneity that may influence the loan interest rates, stemming from bank balance-sheet channels. Together with the other controls, this specification enables us to exhaustively control for bank- and firm-specific loan supply and demand factors.

3.3 The Role of Earmarked Credit

In the second part of the empirical analysis, we examine the effectiveness of monetary policy transmission through private bank credit. Our analysis focuses on two key aspects: first, we assess the effectiveness of monetary policy transmission through earmarked lending mediated by private banks, and second, we investigate whether private banks adjust the interest rates of non-earmarked credit, thereby influencing the transmission of monetary policy through non-earmarked credit. We are interested in whether the earmarked lending relationship affects the transmission.

We begin by analyzing the role of earmarked lending relationship at the extensive margin, comparing the outcomes of having versus not having an earmarked lending relationship. We estimate the following regression:

$$\begin{aligned} y_{lfbct} = \alpha + \beta MP_{BR,t-1} I_{b,BR} + \gamma_1 MP_{BR,t-1} I_{b,BR} Ever_{fb} + \\ + \gamma_2 MP_{BR,t-1} I_{b,BR} Ever_{fb} NE_{lfbt} + \gamma_3 Ever_{fb} NE_{lfbt} + \\ + \Sigma_c \theta_c X_{c,t-1} I_{bc} + \phi Z_{lt} + \epsilon_{lfbct} \end{aligned} \tag{2}$$

where l, f, b, and t index loan, firm, bank, and month respectively. c is the country origin of the bank. $Ever_{fb}$ is a dummy variable that takes a value of 1 if the bank-firm pair has ever established an earmarked lending relationship.[11] Earmarked credit refers to loans funded with directed resources of any type, including those from BNDES, Constitutional Funds, the Housing Finance System (SFH), rural

[11] We define $Ever_{fb}$ as a time-invariant variable because the time variation in earmarked relationship is minimal in the sample. Few bank-firm pairs established a new earmarked relationship or exited existing ones during the sample period.

credit programs, and other institutions. Non-earmarked credit refers to loans funded by banks' own resources. NE_{lfbct} is a dummy variable that takes a value of one for non-earmarked credit. The dependent variable y_{lfbct} and independent variables $MP_{BR,t-1}$, $I_{b,c}$, $X_{c,t-1}$, and Z_{lt} are defined as in equation (1). We include the same set of fixed effects as equation (1). Our main coefficients of interest are γ_1 and γ_2. The former, γ_1, measures how the pass-through of monetary policy to earmarked credit depends on whether or not there is an earmarked relationship. The latter, γ_3, measures how this dependence differ between earmarked and non-earmarked credit. Our sample includes all credit from private banks.

Next, we examine the role of earmarked lending relationship at the intensive margin, comparing the outcomes across varying levels of earmarked exposure. We estimate the following regression:

$$\begin{aligned} y_{lfbct} = \alpha + \beta MP_{BR,t-1} I_{b,BR} + \delta_1 MP_{BR,t-1} I_{b,BR} NE_{lfbt} + \delta_2 MP_{BR,t-1} I_{b,BR} Exposure_{fbt} + \\ + \delta_3 MP_{BR,t-1} I_{b,BR} Exposure_{fbt} NE_{lfbt} + \delta_4 Exposure_{fbt} NE_{lfbt} + \delta_5 Exposure_{fbt} \\ + \delta_6 NE_{lfbt} + \Sigma_c \theta_c X_{c,t-1} I_{bc} + \phi Z_{lt} + \epsilon_{lfbct} \end{aligned} \tag{3}$$

where l, f, b, and t index loan, firm, bank, and month respectively. c is the country origin of the bank. $Exposure_{fbt}$ is a measure of earmarked credit exposure to be specified below. NE_{lfbct} is a dummy variable that takes a value of one for non-earmarked credit. The dependent variable y_{lfbct} and independent variables $MP_{BR,t-1}$, $I_{b,c}$, $X_{c,t-1}$, and Z_{lt} are defined as in equation (1). We include the same set of fixed effects as in equation (1). Our main coefficients of interest are δ_2 and δ_3. The former, δ_2, measures how the pass-through of monetary policy to earmarked credit depends on the firm's earmarked exposure. The latter, δ_3, measures how this dependence differs between earmarked and non-earmarked credit.

We examine two measures of earmarked credit exposure. The first measure assesses exposure from a temporal perspective and is defined as the length of the lending relationship, measured in months since a bank-firm pair established a lending relationship. The second measure evaluates exposure from a loan composition perspective and is defined as the proportion of earmarked credit relative to total credit for a bank-firm pair in a given month.

4 Results

4.1 Government Direct Credit Outcomes

Tables 4 to 5 report the results on the role of government direct credit, as per equation (1). We divide the sample into the two periods of monetary policy (tightening and loosening). This approach enables us to differentiate any potential asymmetry between monetary policy tightening and loosening.

Table 4 the reports results during the tightening period. Column 1 includes bank×firm fixed effects and region×industry×month fixed effects. The sample covers all credit from firms with either single- or multiple-bank relationships. Column 2 repeats the same specification but is limited to firms with

multiple-bank relationships. Column 3 uses the same loan sample but adopts a tighter specification with firm×month fixed effects instead of region×industry×month fixed effects. Column 4 is the tightest and our preferred specification, adding to the column 3 specification bank×month fixed effects.

The coefficient of interest——the triple interaction term of monetary policy, the government bank dummy, and the SME dummy——is negative, indicating a significantly smaller pass-through for government direct credit to SMEs. This result is consistent across all columns, with the absolute magnitude of the coefficient being largest in the tightest specification and statistically significant at the 1 percent level. The result is also economically significant. The preferred specification indicates that a 10 basis point tightening of monetary policy is associated with a 56 basis point lower pass-through for government direct credit to SMEs.

Our findings reveal differing sensitivities to monetary policy changes depending on origin and destination of the credit. The smaller pass-through of government direct credit to SMEs reflects an implicit subsidy via lower interest rates during periods of monetary policy tightening, which helps alleviate SMEs' borrowing costs when interest rates are rising and overall credit supply is limited. It aligns with the developmental role of government credit in supporting SMEs by alleviating their financing costs.

Table 5 presents the findings from the loosening period. The triple interaction term of monetary policy, the government bank dummy, and the SME dummy remains negative in all specifications, but it is not statistically significant. One interpretation of this result is that during a period of monetary policy loosening, when borrowing costs are trending downward and credit supply is abundant, the government subsidy channel becomes less relevant.

4.2 Private Bank Credit Outcomes

Earmarked relationship at the extensive margin

Tables 6 to 9 present the results on the role of earmarked credit at the extensive margin, as per equation (2). We divide the sample based on firm size and the two periods of monetary policy. In each table, the columns follow the same structure as in Tables 4 and 5.

Tables 6 and 7 present the results for SME and large firm credit, respectively, during the tightening period. We do not find a significant effect from having an earmarked relationship for SME credit. For large firms, however, having an earmarked relationship is associated with a significantly stronger pass-through to non-earmarked credit. The result from the tightest and our preferred specification in column 4 suggests that having an earmarked relationship is associated with a 25 basis point higher pass-through in response to a 10 basis point monetary policy shock.[12] One interpretation of this result is that banks are able to "lock in" clients by offering them lower-cost earmarked loans. They can then capture the rent from the earmarked relationship by passing higher loan costs more effectively to these

[12]This is obtained by summing the coefficient of Monetary policy * Ever earmarked * Non-earmarked loans and Ever earmarked * Non-earmarked loans. The sum is significant at the 1 percent level from a t-test.

locked-in clients through non-earmarked loans. But why isn't this channel as strong for SME credit? One possible explanation is that SMEs' lower demand for non-earmarked credit reduces the margin available for rent extraction through such loans.

Tables 8 and 9 present the results for SME and large firm credit, respectively, during the loosening period. Unlike the significant effect observed during the tightening period, we do not find a significant effect from having an earmarked relationship during this period. One possible explanation is that when monetary policy loosens, making credit cheaper and more abundant, competition reduces the potential rent that banks can capture.

Earmarked relationship at the intensive margin

Tables 10 to 13 present the results on the role of earmarked credit at the intensive margin, as per equation (3), with earmarked exposure measured by the length of the lending relationship. We again divide the sample based on firm size and the two periods of monetary policy.

Table 10 examines SME credit during the tightening period. We find that a longer earmarked relationship is associated with a stronger pass-through to earmarked credit. The estimates are of similar magnitude across specifications and are statistically significant at the 1 percent level. This indicates that banks are able to pass higher costs more effectively to their "locked-in" long-term clients via earmarked credit. The result from our preferred specification in column 4 suggests that a one-year longer earmarked relationship is associated with a 19 basis point higher pass-through in response to a 10 basis point monetary policy shock.[13] One possible reason for this channel is that a longer relationship suggests greater dependence on earmarked credit and a less elastic credit demand with respect to interest rates. Additionally, we find that a longer earmarked relationship does not have a significant impact on the interest rate of non-earmarked credit. The absence of spillover effects from earmarked to non-earmarked credit at the intensive margin complements our earlier finding on the extensive margin.

Table 11 presents the results for large firm credit during the tightening period. We find that a longer earmarked relationship is associated with a stronger pass-through to earmarked credit, but there is no significant effect on non-earmarked credit. The tightest specification in column 4 suggests that a one-year longer earmarked relationship for large firms is associated with a 7 percentage point higher pass-through in response to a 10 basis point monetary policy shock. This is smaller than for SMEs (19 percentage points). This difference could reflect SMEs's more limited credit access and greater dependence on earmarked loans than large firms.

Tables 12 and 13 show the results for SMEs and large firms, respectively, during the loosening period. In both cases, we find that a longer earmarked relationship correlates with a weaker pass-through to earmarked credit. One possible explanation is that when monetary conditions are loosening, access to low-cost earmarked credit becomes less valuable for the long-term clients. We also find the effect smaller for large firm earmarked credit than for SME earmarked credit. As in the tightening

[13] This is obtained by multiplying the the coefficient of Monetary policy * Relationship length by 12 (months).

period, the length of the lending relationship does not have a significant effect on the interest rate of non-earmarked credit.

Appendix Tables A1 to A4 replicate the analysis but replace relationship length with the share of earmarked credit in total credit. During the tightening period, a higher share of earmarked credit does not have a significant effect on the interest rates of either earmarked or non-earmarked loans, for SMEs or large firms alike. The results are the same during the loosening period with one exception. We find a positive correlation, significant at the 10 percent level, between the share of earmarked loans and the interest rate of earmarked loans. Overall, the results suggest that earmarked exposure, measured by the share of earmarked loans in total loans, has little effect on monetary policy pass-through. A large earmarked share may simply reflect variations in the firm's business model, with more eligible projects for earmarked credit.

5 Conclusion

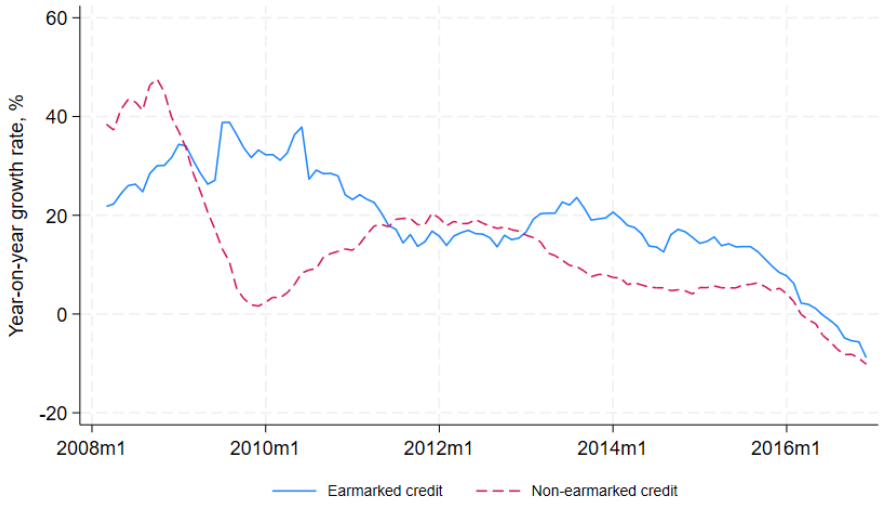
This paper explores the intricate relationship between government credit and monetary policy transmission, a critical aspect of macro-financial policies highlighted by recent crises such as the COVID-19 pandemic and the Global Financial Crisis. It investigates how government credit, via direct lending and indirect earmarked credit, influences monetary policy dynamics, examining differing views on its effectiveness. Using detailed credit registry data from Brazil during a period of significant government intervention, we analyze its impact across loan segments and monetary policy cycles. Our findings reveal nuanced effects: government direct lending supports SMEs by alleviating their financing costs during periods of monetary policy tightening, while indirect lending through private banks introduces complexities. The pass-through of earmarked loans depends on the length of the earmarked relationship and the monetary policy stance. We also find evidence of cross-subsidization between earmarked and non-earmarked credit for large firms during tightening periods.

These insights provide valuable information for policymakers regarding the impacts and trade-offs associated with government credit. Government credit can be used to support SMEs in a tight monetary policy environment, aligning with development goals. However, this comes at the cost of reducing the overall effectiveness of monetary policy transmission. The role of earmarked credit in monetary policy transmission is complex, highlighting the heterogeneity in transmission across different credit market segments and throughout the monetary policy cycle. Understanding the heterogeneous channels of transmission is crucial for enhancing the overall effectiveness of monetary policy.

Figure 1: Credit growth by bank ownership

Notes: This figure plots the year-on-year growth rate for government banks, domestic private banks, and foreign banks. Source: Central Bank of Brazil and authors' calculations.

Figure 2: Credit growth by bank ownership



Notes: This figure plots the year-on-year growth rate for earmarked and nonearmarked credit to non-financial corporations. Source: Central Bank of Brazil and authors' calculations.

Table 1: Summary statistics: all credit

	No. observation	Mean	Std. Dev	Min	P50	Max
Panel A: SMEs						
Loosening period						
Interest rate	21,000,000	46.7	36.7	0.2	28.0	100.0
ln(amount)	21,000,000	9.9	1.1	8.5	9.7	14.0
Rating	21,000,000	8.8	1.2	2.0	9.0	10.0
Maturity	21,000,000	0.5	0.9	0.0	0.2	14.6
Collateral	21,000,000	0.3	0.5	0.0	0.0	1.0
Government loan	21,000,000	0.2	0.4	0.0	0.0	1.0
Tightening period						
Interest rate	31,200,000	46.2	34.9	0.3	12.0	100.0
ln(amount)	31,200,000	9.9	1.1	8.5	10.0	14.0
Rating	31,200,000	8.7	1.2	2.0	10.0	10.0
Maturity	31,200,000	0.6	1.0	0.0	0.2	34.9
Collateral	31,200,000	0.3	0.4	0.0	0.0	1.0
Government loan	31,200,000	0.3	0.4	0.0	0.0	1.0
Panel B: Large firms						
Loosening period						
Interest rate	1,030,420	20.3	25.2	0.2	30.0	100.0
ln(amount)	1,030,420	10.3	1.4	8.5	9.6	14.0
Rating	1,030,420	9.4	1.0	2.0	9.0	10.0
Maturity	1,030,420	0.4	0.9	0.0	0.2	13.8
Collateral	1,030,420	0.2	0.4	0.0	0.0	1.0
Government loan	1,030,420	0.1	0.2	0.0	0.0	1.0
Tightening period						
Interest rate	2,089,822	16.7	13.9	0.3	14.0	100.0
ln(amount)	2,089,822	10.3	1.3	8.5	10.1	14.0
Rating	2,089,822	9.4	1.0	2.0	10.0	10.0
Maturity	2,089,822	0.3	0.6	0.0	0.2	19.6
Collateral	2,089,822	0.2	0.4	0.0	0.0	1.0
Government loan	2,089,822	0.0	0.2	0.0	0.0	1.0

Notes: This table reports summary statistics of all credit from government and private banks. Interest rate is the contracted interest rate of a new loan in a given month. Loan amount is measured in natural logarithm. Rating is a set of dummy variables for loan rating. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Maturity is the time to maturity measured in months. Collateral is a dummy variable that takes the value of one if there is a collateral. Collateral is a dummy variable that takes the value of one for credit from government banks. The loosening period is from September 2011 to March 2013 and the tightening period is from April 2013 to September 2016.

Table 2: Summary statistics: SME credit from private banks

	No. observations	Mean	Std. Dev	Min	P50	Max
Panel A: All firms						
Loosening period						
Interest rate	10,200,000	26.5	17.4	0.2	22.0	100.0
ln(amount)	10,200,000	10.0	1.2	8.5	9.7	14.0
Rating	10,200,000	8.7	1.1	2.0	9.0	10.0
Maturity	10,200,000	0.6	1.0	0.0	0.2	14.6
Collateral	10,200,000	0.3	0.5	0.0	0.0	1.0
Share of earmarked loans	10,200,000	0.1	0.2	0.0	0.0	1.0
Non-earmarked loans	10,200,000	1.0	0.1	0.0	1.0	1.0
Length of relationship	9,289,453	74.4	92.8	0.0	36.4	603.1
Tightening period						
Interest rate	14,800,000	27.5	17.4	0.3	23.0	99.9
ln(amount)	14,800,000	9.9	1.2	8.5	9.6	14.0
Rating	14,800,000	8.6	1.2	2.0	9.0	10.0
Maturity	14,800,000	0.6	1.0	0.0	0.2	29.5
Collateral	14,800,000	0.3	0.5	0.0	0.0	1.0
Share of earmarked loans	14,800,000	0.1	0.2	0.0	0.0	1.0
Non-earmarked loans	14,800,000	1.0	0.2	0.0	1.0	1.0
Length of relationship	13,900,000	82.9	96.1	0.0	46.5	634.0
Panel B: Firms with multiple-bank relationships						
Loosening period						
Interest rate	7,851,746	24.8	16.4	0.3	21.0	100.0
ln(amount)	7,851,746	10.0	1.3	8.5	9.7	14.0
Rating	7,851,746	8.7	1.1	2.0	9.0	10.0
Maturity	7,851,746	0.5	0.9	0.0	0.2	14.6
Collateral	7,851,746	0.3	0.5	0.0	0.0	1.0
Share of earmarked loans	7,851,746	0.1	0.2	0.0	0.0	1.0
Non-earmarked loans	7,851,746	1.0	0.2	0.0	1.0	1.0
Length of relationship	7,131,936	81.5	96.8	0.0	43.6	603.1
Tightening period						
Interest rate	11,200,000	25.7	16.0	0.3	22.0	99.9
ln(amount)	11,200,000	9.9	1.2	8.5	9.6	14.0
Rating	11,200,000	8.6	1.1	2.0	9.0	10.0
Maturity	11,200,000	0.5	0.9	0.0	0.2	29.5
Collateral	11,200,000	0.3	0.5	0.0	0.0	1.0
Share of earmarked loans	11,200,000	0.1	0.2	0.0	0.0	1.0
Non-earmarked loans	11,200,000	1.0	0.2	0.0	1.0	1.0
Length of relationship	10,500,000	91.1	100.0	0.0	55.0	634.0

Notes: This table reports summary statistics of SME credit from private banks. Interest rate is the contracted interest rate of a new loan in a given month. Loan amount is measured in natural logarithm. Rating is a set of dummy variables for loan rating. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Maturity is the time to maturity measured in months. Collateral is a dummy variable that takes the value of one if there is a collateral. Share of earmarked is earmarked credit as a share of total credit for a bank-firm pair in a given month. Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Relationship length is measured as the number of months since a bank-firm pair established a lending relationship. The loosening period is from September 2011 to March 2013 and the tightening period is from April 2013 to September 2016.

Table 3: Summary statistics: large firm credit from private banks

	No. observations	Mean	Std. Dev	Min	P50	Max
Panel A: All firms						
Loosening period						
Interest rate	883,982	13.1	8.3	0.3	12.0	99.2
ln(amount)	883,982	10.3	1.4	8.5	10.1	14.0
Rating	883,982	9.4	0.9	2.0	10.0	10.0
Maturity	883,982	0.3	0.6	0.0	0.1	13.8
Collateral	883,982	0.2	0.4	0.0	0.0	1.0
Share of earmarked loans	883,982	0.1	0.2	0.0	0.0	1.0
Non-earmarked loans	883,982	1.0	0.1	0.0	1.0	1.0
Length of relationship	805,721	116.5	91.2	0.0	113.7	558.4
Tightening period						
Interest rate	2,007,815	15.7	10.8	0.3	14.0	99.9
ln(amount)	2,007,815	10.3	1.3	8.5	10.1	14.0
Rating	2,007,815	9.5	0.9	2.0	10.0	10.0
Maturity	2,007,815	0.3	0.6	0.0	0.2	19.6
Collateral	2,007,815	0.2	0.4	0.0	0.0	1.0
Share of earmarked loans	2,007,815	0.1	0.3	0.0	0.0	1.0
Non-earmarked loans	2,007,815	0.9	0.3	0.0	1.0	1.0
Length of relationship	1,885,106	135.9	112.8	0.0	112.6	568.6
Panel B: Firms with multiple-bank relationships						
Loosening period						
Interest rate	832,673	13.0	8.0	0.3	12.0	99.2
ln(amount)	832,673	10.3	1.3	8.5	10.0	14.0
Rating	832,673	9.5	0.9	2.0	10.0	10.0
Maturity	832,673	0.3	0.6	0.0	0.1	13.8
Collateral	832,673	0.2	0.4	0.0	0.0	1.0
Share of earmarked loans	832,673	0.1	0.2	0.0	0.0	1.0
Non-earmarked loans	832,673	1.0	0.1	0.0	1.0	1.0
Length of relationship	759,551	118.6	90.4	0.0	116.9	558.4
Tightening period						
Interest rate	1,888,743	15.7	10.7	0.3	14.0	99.9
ln(amount)	1,888,743	10.3	1.3	8.5	10.1	14.0
Rating	1,888,743	9.5	0.9	2.0	10.0	10.0
Maturity	1,888,743	0.3	0.6	0.0	0.2	19.6
Collateral	1,888,743	0.2	0.4	0.0	0.0	1.0
Share of earmarked loans	1,888,743	0.1	0.3	0.0	0.0	1.0
Non-earmarked loans	1,888,743	0.9	0.3	0.0	1.0	1.0
Length of relationship	1,772,185	138.7	113.4	0.0	114.6	568.6

Notes: This table reports summary statistics of large firm credit from private banks. Interest rate is the contracted interest rate of a new loan in a given month. Loan amount is measured in natural logarithm. Rating is a set of dummy variables for loan rating. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Maturity is the time to maturity measured in months. Collateral is a dummy variable that takes the value of one if there is a collateral. Share of earmarked is earmarked credit as a share of total credit for a bank-firm pair in a given month. Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Relationship length is measured as the number of months since a bank-firm pair established a lending relationship. The loosening period is from September 2011 to March 2013 and the tightening period is from April 2013 to September 2016.

Table 4: Government direct credit outcomes: tightening period

	(1)	(2)	(3)	(4)
Monetary policy	3.745	4.021	0.714	
	(3.196)	(3.117)	(1.237)	
Monetary policy * government bank	-5.098	-4.309	-1.582	
	(3.549)	(3.465)	(2.243)	
Monetary policy * SME	-0.211	-0.317	-0.009	-0.050
	(2.268)	(2.508)	(1.066)	(1.359)
Monetary policy * government bank * SME	-3.322	-4.423	-1.748	-5.586***
	(5.455)	(4.088)	(1.505)	(2.029)
Observations	44,746,421	31,540,527	30,496,292	30,494,164
R-squared	0.761	0.742	0.770	0.775
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (1). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Government bank is a dummy variable for Brazilian government banks. SME is a dummy variable for SMEs. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable for the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 5: The role of government direct credit: loosening period

	(1)	(2)	(3)	(4)
Monetary policy	0.746	0.559	-0.085	
	(2.105)	(2.006)	(0.931)	
Monetary policy * government bank	0.492	0.240	1.287	
	(1.121)	(1.128)	(0.891)	
Monetary policy * SME	-0.017	-0.193	-0.084	2.184
	(2.301)	(2.392)	(2.041)	(2.525)
Monetary policy * government bank * SME	-2.653	-2.649	-2.163	-3.932
	(4.301)	(4.312)	(3.450)	(3.078)
Observations	20,550,528	14,714,763	14,206,128	14,205,458
R-squared	0.800	0.779	0.796	0.798
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (1). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Government bank is a dummy variable for Brazilian government banks. SME is a dummy variable for SMEs. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable for the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 6: The role of an earmarked credit relationship: SME credit, tightening period

	(1)	(2)	(3)	(4)
Monetary policy	-2.060	-1.869	-0.930	
	(4.668)	(4.675)	(1.356)	
Monetary policy * Has earmarked * Non-earmarked loans	-1.361	2.154	-3.631	4.876
	(9.932)	(9.140)	(4.199)	(8.612)
Has earmarked * Non-earmarked loans	0.071	3.283	4.427	4.007
	(6.253)	(5.339)	(6.139)	(6.370)
Monetary policy * Has earmarked	2.336	-1.503	3.319	-4.510
	(7.882)	(7.281)	(3.630)	(8.694)
Observations	31,107,576	21,085,361	20,135,008	20,133,041
R-squared	0.770	0.752	0.780	0.782
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (2). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Ever earmarked relationship is a dummy variable that takes a value of one if the bank-firm pair has established an earmarked lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 7: The role of an earmarked credit relationship: large firm credit, tightening period

	(1)	(2)	(3)	(4)
Monetary policy	-0.636	-0.651	-1.003	
	(3.150)	(3.175)	(0.830)	
Monetary policy * Has earmarked * Non-earmarked loans	7.742***	11.148***	2.238	7.673***
	(2.074)	(2.632)	(1.578)	(0.488)
Has earmarked * Non-earmarked loans	7.029***	7.283**	7.788***	7.353**
	(2.527)	(2.713)	(2.855)	(2.743)
Monetary policy * Has earmarked	1.072	-2.176	0.822	-5.146***
	(3.424)	(3.662)	(0.814)	(0.693)
Observations	2,944,255	2,775,334	2,804,191	2,802,663
R-squared	0.725	0.707	0.698	0.709
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (2). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Ever earmarked relationship is a dummy variable that takes a value of one if the bank-firm pair has established an earmarked lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 8: The role of an earmarked credit relationship: SME credit, loosening period

	(1)	(2)	(3)	(4)
Monetary policy	-6.236	-6.830	-3.177*	
	(4.072)	(4.381)	(1.753)	
Monetary policy * Has Earmarked * Non-earmarked loans	22.595	16.588	13.949	13.734
	(13.142)	(13.073)	(11.514)	(11.002)
Has Earmarked * Non-earmarked loans	-6.090	-2.766	-2.934	-3.017
	(9.386)	(8.247)	(9.505)	(9.622)
Monetary policy * Has Earmarked	-24.672*	-18.359	-14.188	-13.934
	(12.862)	(12.654)	(11.247)	(10.745)
Observations	15,195,866	10,488,305	10,007,734	10,007,095
R-squared	0.781	0.762	0.781	0.782
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (2). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Ever earmarked relationship is a dummy variable that takes a value of one if the bank-firm pair has established an earmarked lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 9: The role of an earmarked credit relationship: large firm credit, loosening period

	(1)	(2)	(3)	(4)
Monetary policy	0.127	-0.105	-2.166*	
	(1.169)	(1.076)	(1.106)	
Monetary policy * Has earmarked * Non-earmarked loans	-2.408	-2.829	-1.602	-1.767
	(4.519)	(4.790)	(3.521)	(3.176)
Has earmarked * Non-earmarked loans	0.324	0.303	0.594	0.297
	(3.682)	(4.510)	(4.566)	(4.644)
Monetary policy * Has earmarked	0.842	1.332	0.671	0.971
	(4.840)	(4.938)	(3.365)	(2.966)
Observations	955,384	889,361	902,597	902,141
R-squared	0.963	0.958	0.952	0.954
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (2). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Ever earmarked relationship is a dummy variable that takes a value of one if the bank-firm pair has established an earmarked lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 10: The role of earmarked relationship length: SME credit, tightening period

	(1)	(2)	(3)	(4)
Monetary policy	6.275	-0.773	-14.473	
	(8.809)	(8.405)	(8.818)	
Monetary policy * Relationship length * Non-earmarked loans	-0.164***	-0.187***	-0.164***	-0.155**
	(0.055)	(0.056)	(0.056)	(0.059)
Relationship length * Non-earmarked loans	-0.008	-0.022	-0.022	-0.024
	(0.031)	(0.027)	(0.032)	(0.032)
Monetary policy * Relationship length	0.129**	0.147***	0.142***	0.158**
	(0.053)	(0.052)	(0.049)	(0.061)
Monetary policy * Non-earmarked loans	7.113	15.119	17.128	16.329
	(11.317)	(11.404)	(11.091)	(11.700)
Relationship length	-0.004	0.009	0.021	0.027
	(0.026)	(0.022)	(0.028)	(0.032)
Non-earmarked loans	0.908	5.473	6.631	6.554
	(4.844)	(3.851)	(4.936)	(5.124)
Observations	28,960,631	19,660,398	18,728,262	18,726,360
R-squared	0.770	0.752	0.780	0.782
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Relationship length is measured as the number of months since a bank-firm pair established a lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 11: The role of earmarked relationship length: large firm credit, tightening period

	(1)	(2)	(3)	(4)
Monetary policy	-8.405	-10.887	-8.498	
	(7.689)	(11.221)	(6.200)	
Monetary policy * Relationship length * Non-earmarked loans	-0.104***	-0.106***	-0.060**	-0.060**
	(0.020)	(0.029)	(0.024)	(0.025)
Relationship length * Non-earmarked loans	-0.032***	-0.032***	-0.030**	-0.031**
	(0.012)	(0.012)	(0.012)	(0.013)
Monetary policy * Relationship length	0.051**	0.052*	0.046*	0.057**
	(0.020)	(0.028)	(0.025)	(0.025)
Monetary policy * Non-earmarked loans	19.438***	22.153***	10.564*	12.083
	(4.140)	(6.846)	(5.445)	(7.189)
Relationship length	0.030**	0.031**	0.031**	0.026*
	(0.013)	(0.013)	(0.013)	(0.013)
Non-earmarked loans	13.332***	13.750***	13.721***	13.481***
	(2.763)	(2.759)	(3.104)	(3.311)
Observations	2,751,795	2,594,433	2,620,653	2,619,223
R-squared	0.729	0.712	0.702	0.713
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Relationship length is measured as the number of months since a bank-firm pair established a lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 12: The role of earmarked relationship length: SME credit, loosening period

	(1)	(2)	(3)	(4)
Monetary policy	-14.708*	-7.461	-4.778	
	(7.188)	(5.963)	(7.508)	
Monetary policy * Relationship length * Non-earmarked loans	0.294**	0.341***	0.305***	0.327***
	(0.113)	(0.075)	(0.080)	(0.072)
Relationship length * Non-earmarked loans	-0.039*	-0.045***	-0.048***	-0.049***
	(0.020)	(0.013)	(0.012)	(0.012)
Monetary policy * Relationship length	-0.294**	-0.340***	-0.303***	-0.319***
	(0.121)	(0.085)	(0.092)	(0.073)
Monetary policy * Non-earmarked loans	15.055*	7.415	4.124	3.614
	(7.636)	(6.132)	(6.867)	(6.869)
Relationship length	0.069***	0.060***	0.054***	0.060***
	(0.021)	(0.015)	(0.011)	(0.018)
Non-earmarked loans	-3.212	0.881	1.250	1.168
	(10.955)	(9.228)	(10.566)	(10.579)
Observations	13,700,121	9,471,539	9,004,161	9,003,529
R-squared	0.783	0.764	0.782	0.784
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Relationship length is measured as the number of months since a bank-firm pair established a lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table 13: The role of earmarked relationship length: large firm credit, loosening period

	(1)	(2)	(3)	(4)
Monetary policy	11.823**	12.019**	6.126**	
	(5.045)	(4.373)	(2.630)	
Monetary policy * Relationship length * Non-earmarked loans	0.106**	0.105***	0.070***	0.076***
	(0.037)	(0.035)	(0.016)	(0.016)
Relationship length * Non-earmarked loans	-0.014	-0.012	-0.013	-0.012
	(0.031)	(0.031)	(0.032)	(0.033)
Monetary policy * Relationship length	-0.105***	-0.105***	-0.070***	-0.077***
	(0.036)	(0.034)	(0.017)	(0.016)
Monetary policy * Non-earmarked loans	-12.447**	-12.606**	-7.008**	-7.718**
	(5.183)	(4.507)	(3.043)	(3.219)
Relationship length	0.013	0.012	0.010	0.012
	(0.029)	(0.029)	(0.032)	(0.032)
Non-earmarked loans	3.533	3.063	3.507	3.092
	(6.552)	(7.041)	(7.217)	(7.453)
Observations	873,899	813,047	824,639	824,233
R-squared	0.965	0.960	0.955	0.956
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Relationship length is measured as the number of months since a bank-firm pair established a lending relationship. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

A Appendix

Table A1: The role of earmarked credit share: SME credit, tightening period

	(1)	(2)	(3)	(4)
Monetary policy	-0.408	0.355	0.970	
	(5.391)	(5.458)	(6.397)	
Monetary policy * Earmarked share * Non-earmarked loans	6.257	7.974	0.794	10.111
	(7.950)	(7.740)	(6.925)	(8.897)
Earmarked share * Non-earmarked loans	-0.193	0.472	0.275	0.259
	(4.250)	(4.344)	(4.729)	(4.898)
Monetary policy * Earmarked share	-4.332	-6.601	-0.973	-10.059
	(6.962)	(6.951)	(6.469)	(8.181)
Monetary policy * Non-earmarked loans	-1.511	-2.434	-2.558	-4.948
	(6.958)	(6.852)	(6.552)	(7.583)
Earmarked share	4.438	4.041	4.817	4.957
	(2.890)	(3.122)	(3.931)	(3.814)
Non-earmarked loans	10.055***	10.428***	11.468***	11.417***
	(2.171)	(2.311)	(2.747)	(2.782)
Observations	9,107,202	7,195,048	6,919,040	6,918,457
R-squared	0.776	0.772	0.793	0.795
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Earmarked share is the share of earmarked credit in total credit. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table A2: The role of earmarked credit share: large firm credit, tightening period

	(1)	(2)	(3)	(4)
Monetary policy	2.911	0.558	-1.016	
	(3.537)	(4.329)	(1.327)	
Monetary policy * Earmarked share * Non-earmarked loans	6.715	6.554	1.815	2.041
	(5.041)	(5.340)	(3.103)	(2.448)
Earmarked share * Non-earmarked loans	0.389	-0.114	-0.221	-0.969
	(0.752)	(0.878)	(1.047)	(0.807)
Monetary policy * Earmarked shareh	-1.414	-0.847	0.600	-1.959
	(3.351)	(2.879)	(1.255)	(1.834)
Monetary policy * Non-earmarked loans	0.207	2.536	0.944	4.060*
	(2.664)	(3.098)	(1.998)	(2.087)
Earmarked share	1.755*	2.068*	3.903**	2.082*
	(0.985)	(1.049)	(1.797)	(1.221)
Non-earmarked loans	3.993**	4.522***	4.983***	5.150***
	(1.540)	(1.539)	(1.447)	(1.508)
Observations	2,913,228	2,749,681	2,777,228	2,776,044
R-squared	0.690	0.679	0.666	0.679
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Earmarked share is the share of earmarked credit in total credit. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table A3: The role of earmarked credit share: SME credit, loosening period

	(1)	(2)	(3)	(4)
Monetary policy	-36.522*	-31.256*	-29.955	
	(19.371)	(17.300)	(20.390)	
Monetary policy * Earmarked share * Non-earmarked loans	-31.905**	-26.708**	-27.016*	-26.992*
	(14.189)	(12.228)	(15.271)	(15.225)
Earmarked share * Non-earmarked loans	-5.113	-5.230	-4.766	-4.633
	(3.830)	(3.674)	(4.637)	(4.574)
Monetary policy * Earmarked share	31.341**	26.286**	25.675*	26.689*
	(13.780)	(11.938)	(14.558)	(15.175)
Monetary policy * Non-earmarked loans	38.686*	33.182*	31.204	31.794
	(19.956)	(17.889)	(20.470)	(21.428)
Earmarked share	8.166***	8.991***	9.844**	9.432**
	(2.688)	(2.636)	(3.545)	(3.493)
Non-earmarked loans	17.564***	17.855***	17.966***	17.742***
	(4.244)	(4.288)	(5.039)	(4.981)
Observations	9,107,202	7,195,048	6,919,040	6,918,457
R-squared	0.776	0.772	0.793	0.795
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Earmarked share is the share of earmarked credit in total credit. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

Table A4: The role of earmarked credit share: large firm credit, loosening period

	(1)	(2)	(3)	(4)
Monetary policy	-2.934	-3.330	-0.546	
	(2.995)	(3.831)	(1.258)	
Monetary policy * Earmarked share * Non-earmarked loans	-4.872*	-5.454*	1.360	2.953
	(2.694)	(2.923)	(1.414)	(1.723)
Earmarked share * Non-earmarked loans	4.897*	5.194*	5.363*	4.626
	(2.620)	(2.950)	(2.912)	(2.951)
Monetary policy * Earmarked share	1.382	1.911	-1.635	-2.325
	(2.578)	(2.809)	(1.683)	(1.546)
Monetary policy * Non-earmarked loans	3.476	3.829	0.204	-0.773
	(3.382)	(4.173)	(1.934)	(1.462)
Earmarked share	-4.716*	-4.941*	-2.628	-3.908
	(2.493)	(2.733)	(2.856)	(2.832)
Non-earmarked loans	-0.347	-0.021	-0.029	0.190
	(1.671)	(1.934)	(2.017)	(2.065)
Observations	859,306	813,001	825,753	825,348
R-squared	0.864	0.859	0.841	0.848
Firm-Bank FE	Yes	Yes	Yes	Yes
Region-Industry-Time FE	Yes	Yes	No	No
Firm-Time FE	No	No	Yes	Yes
Bank-Time FE	No	No	No	Yes
Firms borrowing from more than 1 bank	No	Yes	Yes	Yes

Notes: This table reports estimates of equation (3). The dependent variable is the interest rate of a new loan in a given month. Monetary policy is the one-month lagged policy rate, measured by SELIC (in percent). Non-earmarked loans is a dummy variable that takes a value of one for non-earmarked credit. Earmarked share is the share of earmarked credit in total credit. The set of controls includes macroeconomic controls and loan-level controls. Macroeconomic controls include one-month lagged annual growth rates of foreign countries' GDPs and CPIs, all interacted with the indicator variable of the bank's country origin. Loan-level controls include loan amount, collateral, loan ratings, and loan maturity. Loan amount is measured in natural logarithm. Collateral is a dummy variable that takes the value of one if there is a collateral. Loan ratings are dummy variables of the loan. There are nine ratings but we consider only the top four ratings, which account for most of the observations. The base-case is the worst rating. Loan maturity is the time to maturity measured in months. Standard errors (in parentheses) are clustered by at the bank and month level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent, respectively.

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