Interest Rate Policy, Credit Subsidies and Banking Margins

Kamaiaji Castor
Instituto de Economia/UFRJ

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Abstract

What's the effect of a subsidised funding cost on banking margins? Brazilian National Development Bank (BNDES) recent experience offers some insights. Between 2002 and 2017, BNDES interest rate for financial intermediaries - TJLP - was a rate independent of the base rate set by the Central Bank. Since 2018, a new rate (TLP), more aligned to the long term borrowing cost for the Treasury, replaced the subsidised rate. Data from a major BNDES' credit line for small and medium firms has pointed for a increase on average price-cost-margins of financial intermediaries from 0.65 p.p to 1.77 p.p after 2018. Besides, considering a dynamic panel data derived from a simple oligopolistic credit market, I estimate a increase on final banking margins of 0.7 p.p after TLP, condition on the funding cost, the base rate and intra-sector demand shocks. Finally, under TLP, I also estimate the equation for banking margins finding a negative reaction coefficient for the funding cost just as it was obtained for the base rate under the period of TJLP (2002-2017). This result is in line with a basic term structure from a New Keynesian model where the long term rate moves on the same direction as the short term rate set by the Central Bank. This is a new found on the credit subsidy effect on markup dynamics in line with previous literature findings which pointed for financial margins offsetting the monetary policy in scenarios where the funding cost is totally dependent of the base rate.

Keywords: financial markups, interest rates, banking, subsidy.

Resumo

Qual o efeito de um custo de *funding* subsidiado nas margens bancárias? A experiência recente do BNDES oferece algumas respostas. Entre 2002 e 2017, a taxa de juros (TJLP) cobrada aos intermediários financeiros do BNDES era na prática independente da taxa básica de juros definida pelo Banco Central. No entanto, desde 2018, uma nova taxa (TLP), mais alinhada ao custo de financiamento do Tesouro junto ao mercado, substituiu a TJLP. Dados de uma significativa linha de crédito do BNDES para micro, pequenas e médias firmas apontam para um aumento nos markups médios dos intermediários financeiros de 0.65 p.p para 1.77 p.p depois de 2018. Além disto, a partir de um painel dinâmico derivado de um modelo de competição imperfeita entre bancos em um mercado de crédito, foi estimado um aumento de 0.7 p.p depois da TLP, condicional ao custo de financiamento, a taxa básica de juros e a choques de demanda setorial. Finalmente, ainda para o período da TLP, foi estimada a equação de margens bancárias na qual foi obtida um coeficiente negativo para o custo de *funding*, o mesmo sinal do coeficiente obtido para a taxa básica de juros durante o período da TJLP (2002-2017). Este resultado está em linha com uma simples estrutura a termo da taxa de juros presente em um modelo Novo Keynersiano padrão no qual a taxa de juros de longo prazo se move na mesma direção que a taxa de juros de curto prazo definida pelo Banco Central. Este é um resultado novo sobre o efeito de subsídio de crédito na dinâmica das margens bancárias em linha com resultados anteriores que apontavam margens financeiras contrabaleceando a política monetária em cenários em que o custo de *funding* é totalmente dependente da taxa básica de juros.
Palavras-chaves: markups, taxas de juros, subsídio.

JEL: D22, C23, E32
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1 Introduction

Industries financed by development banks are pervasive on emerging economies. Given a weak and less competitive private credit markets, these institutions use a broad range of finance designs to focus on small and medium firms, innovation and infrastructure. One particular instrument is subsidised interest rates[1]. According to the Global Survey of Development Banks (LUNA-MARTINEZ et al., 2017), 51% offer credit products with a mix of market-based and subsidized rates. Besides, 64% have private financial intermediaries which lend to the final client (industry) using the funding from the development bank. Particularly, this is the case of the Brazilian Development Bank (BNDES).

From a theoretical perspective, there is some justification related to positive externalities, credit rationing and the need to finance strategic sectors for the economy. These topics motivate a important role for this kind of development institution (ARMENDARIZ, 1999; DIAMOND, 1957; LAZZARINI et al., 2015; MAZZUCATO; PENNA, 2016). In addition, subsidy rates are also view as a amplifier of fiscal policy effects which could potential attenuate high and volatile credit spreads (CORREIA et al., 2018). Also, subsidy has a impact on credit market equilibrium through a intensive margin where credit demand goes up as the funding cost falls; and a extensive margin where new borrowers, who otherwise had no access to finance without the subsidy, entry on the market (LUCAS, 2016; STIGLITZ; WEISS, 1981). Finally, direct benefit or loss for consumers is a function of supply and demand elasticity's. In this case, a focal point is the pass through for the final interest rate set by the banks. In other words, how sensible is the banking margin to a subsidy on credit loans. I address this question using a major shift on Brazilian legislation in 2017 which replaced a long term subsidised interest rate (TJLP) by a rate more aligned to market rates (TLP) for loan operations from BNDES.

In addition, TLP was created in line with a series of Central Bank's proposals to get a more competitive banking industry (Agenda BC+). The idea is that the final interest rates on private credit markets (on average, 39.9% compared to 3.7% for the credit lines from BNDES and Caixa Econômica Federal)[2] were high because a series of market structure inefficiencies, including that BNDES rate was subsidised.

However, one point that was not discussed along the creation of TLP was the possible effect of a subsidised funding cost on banking competition between BNDES' financial intermediaries. In this article, I use the BNDES experience with the end of TJLP to capture the effect of this legislation change on banking margins from a representative credit market for small and medium firms.

A major limitation here is that I do not make any estimates of causal impact of the new resolution, given the policy design affected all banks at the same time and it's not possible to get a counterfactual. Nonetheless, I consider this article as a first approach to shed some light on what happened to BNDES' financial intermediaries banking margins after TLP. After all, this may be relevant for policy makers interested in designing a more competitive banking market structure.

In this sense, this article is an application to a major credit line on Brazil of Hofstetter, Tovar e Urrutia (2011) who estimated the subsidy pass-through to mortgage loans on Colombia. It's also motivated by the results of Correia et al. (2018) related to the impact of credit subsidies on the business cycle through its effect on financial margins. Besides, in times with more questions about the role of Development Banks, this article seeks to fill a gap on applied literature related to banking margins and subsidised funding cost from these institutions.

Historical and institutional background of BNDES are presented on the following section. Then, I get a reduced form equation for banking margins on a credit market derived from a oligopolistic model with homogeneous product for banking in order to capture the effect on financial margins on

[1] "*A subsidy is an explicit or implicit transfer from the public sector to the private sector resulting in a different set of conditions and prospects for private sector projects than would normally be the case without such transfers*" (VELDE; DIRK; WARNER, 2007). Formally, in our case, subsidy is the difference between the interest rate for loan operation from the National Development Bank and the rate which would occur if there is only a private credit market. As we do not have this counterfactual, this article considers a subsidy the difference between the interest rate for loans from the National Development Bank and the borrowing cost for the Government funding this institution.

[2] Relatório Grupo de Trabalho Comissão de Assuntos Econômicos, Inovação e Competição: novos caminhos para redução dos spreads bancários (custos e margens da intermediação financeira), 2018

the BNDES credit market since the legislation change in 2017. Results section shows a increasing on price-cost-margins (PCM) for the financial intermediaries after TLP (2018-2019). Also, for this period, the PCM reaction coefficient to the funding cost became negative, the same sign estimated under TJLP period (2002-2017) for the base rate. This result is in line with a basic term structure from a New Keynesian framework where the short term rate set by the Central Bank is positively related to the long term rate for the Treasury's bonds. Finally, a conclusion sums up potential discussions about the results.

2 Institutional Background

On the post second war period, few institutions represent Brazil's historical changes as well as the National Development Bank (BNDES). This institution is always a focal point on theoretical and political disputes about paths toward the development. Created in June 1952 to funding the expansion of the electric, transport and oil industry, BNDES emerged as the responsible to finance the industrialization of a natural resource exporting economy. At that time, economic literature for Latin America was dominated by the "imports substitution"view from *Comissão Econômica para a América Latina e o Caribe* (CEPAL). Industrialization was the main objective and all the financial instruments to sustain capital accumulation were considered a necessary condition for development (BIELSCHOWSKY, 1998). A interest rate policy with credit subsidies is a example for such interventionist view (CEPAL, 1976).

From a international perspective, in the 50's and 70's, development banks were regarded as one of the main responsible for structural changes on underdevelopment economies. Through direct funding from the government which centralised internal and external capital resources, these institutions had played a fundamental role in shaping rapid growing national firms and also had helped preserve infant industries from imports competition (IDB, 2005).

However, since the 1980s, critics of these institutions have gained increasingly political influence. On the theoretical side, economic literature has been pointed the perverse effects of government failures (GRAND, 1991; WOLF, 1979). In this view, state owned institutions were evidences of corruption, elite capture and bad economic decisions. Privatization came as a solution to the third world problems such as lack of efficiency and it was used as a condition for financial aid agreements with IMF and World Bank on recurrent debt crisis along the 80's and 90's. Finally, weak capital markets on these economies were considered a result of unnecessary financial subsidies from state owned banks which prevent competition on private markets. In this sense, as the economy turns more open to international capital flows, this lack of funding for long term projects would be mitigated (YEAPLE; MOSKOWITZ, 1995).

Brazil's history is not so different. After a strong growth performance on the 50's, the military dictatorship took power in 1964 with a austerity policy to stabilize prices and wages (BASTIAN, 2013). However, the influence of development policies from State on the economy was rapidly recovered with a broad range of interventions on strategic sectors like energy, transport, oil, agricultural and construction (CASTRO et al., 2011a). To illustrate this, in 1966, two years after the *coup*, the Government created the main BNDES credit line for machinery acquisition from national suppliers and plant expansion of small and medium firms, the *Agência Especial de Financiamento Industrial*, **Finame**. This credit line was viewed as a strategic policy for Brazilian industrialists (COSTA; MELO; ARAUJO, 2016).

Finame credit line is based on a institutional design where a client (industry) goes to a commercial bank and asks for a BNDES credit line. In this sense, banks are free to set their own loan rates but bear the risk of default. In this way, the banks act only as financial intermediaries for the BNDES credit products.

Historical evidences suggest that the cost for all loan operations from BNDES, including Finame, have always been subsidised. Either because a cap of 12% on interest rates until 1963 (Usury's Law) in times with inflation above 20% or because high external borrowing cost for the government along the 70's and 80's, given a fiscal, balance of payments and inflation crisis.

"At what rate should BNDES lend?" was not a question for the government until the 90's in a scenario where the main objective was to make possible the development of a industrial economy with less external dependence. The fact is that the unbalances generated through a series of state policies to sustain a rapid growth and a structural change from a agrarian to a urban emerging economy were faced along the 90's.

The question above based of one the main transformations during the price stabilization period. In 1991, Congress approved a law (*Lei 8.1777, 01 de Março de 1991*) which aimed to end a history of indexation on Brazilian economy through the introduction of a "forward looking" reference rate, called Taxa Referencial - TR (CASTRO et al., 2011b). This rate was basically a average of interbank insterest rate and it was used to base all the funding for BNDES credit operation. In 1994, four months after the introduction of a new currency (Real), Federal Government recognized the difficulties for finance BNDES' operations given the macroeconomic stabilization strategy and the 91's Law.

On the macro side, a tight monetary policy was applied through a high base interest rate to sustain a fixed exchange rate and a stable aggregate demand (CASTRO et al., 2011b). At the same time, the rate which based the BNDES operation (TR) was perceived as extremely high for the objectives of a development bank. Even in a scenario where the government was skeptical about the efficiency of the past development model based on a interventionist state, at that time policy makers openly advocated for a active investment policy from BNDES for capital accumulation and growth.[3]

In this sense, the question of how much BNDES should charge for its loans was answered in a way which reconciled respect for the market mechanism (less intervention) and the recognition that much of the long-term financing was state-dependent (more intervention). On Dec. 1994, government implemented a new resolution (*Medida Provisória 802, de 30 de Dezembro de 1994*) creating the *Taxa de Juros de Longo Prazo* (TJLP) to base the cost for BNDES funding. Also, the National Monetary Council was responsible to set this new rate[4].

Persio Arida, president of BNDES at that time (94) and of one the main authors of the new Law, argued that the BNDES rate should be similar to the Treasury borrowing cost from the market considering bonds with a similar maturity to BNDES loan portfolio (COSTA; MELO; ARAUJO, 2016; BCB, 2019). Note that this point consider that base rate, a short term rate aligned to the monetary policy mandate for price stabilization, should be different than the BNDES rate, a long term rate to sustain a capital accumulation for a emerging economy. The main problem of this propose was at that time Brazilian Treasury did not have significant long term liabilities. That's why National Monetary Council set the TJLP to reflect the interest rate for long term foreign debt after the law was approved by the Congress. As we can see on Figure 1, TJLP was sensible to the Asian Crise of Dec.98 when liquidity for emerging economies fell abruptly.

On October 1999 (*Medida Provisória No 1.921, de 30 de Setembro de 1999*), a new change on TJLP set the inflation target and a risk premium as determinants for the BNDES rate. There was no surprise here given since June of this year, Central Bank had adopted a inflation target regime (BARBOSA, 2011). [5]

Between 2000 and 2017, there was no significant change on TJLP legislation. However, between 2000 and Jul.03, the difference between Selic and TJLP have peaked. Along 2002-03, the main reason was the turbulent period for the monetary policy. At that time, the victory of the opposition party to the pro-market incumbent government brought some fear to the financial markets.

From 2004 until 2014, BNDES had been under a new period after a decade plying a role in designing privatization of major state companies. In line with a more interventionist view from the left wing government, this institution was directly used for a long term project to sustain a major

[3] See *Exposição de Motivos da Medida Provisória nº 802, de 30 de Dezembro de 1994* where the Finance and Industry Ministers exposed the main problems posed by the stabilization strategy and the 91's law for a investment policy from BNDES.

[4] The President of Central Bank, the Finance and the Industry Ministers are part of this Council.

[5] History is well know here. The Real Plan was based on a fixed foreign exchange rate. However, in Jan. 99, Central Bank had to deal with a huge market pressure against Real. Following this, a flexible exchange rate and an inflation targeting regime was established to sustain market expectations and preserve the price stability.

development policy and in some years had a portfolio equivalent to almost 10% of the GDP and it was responsible to 20% of loans on the Brazilian credit market (LAZZARINI et al., 2015).[6] In line with a counter cyclical role for development banks, for example, after the 2008 crisis, a broad credit easing with fixed (subsidised) interest rates on loan operations was implemented to sustain investment at a desirable level.[7] In addition, over this period, TJLP was a direct instrument used by the Finance Ministry to oppose the base rate that was under control of Central Bank[8]. In summary, it was a period with a active role for BNDES which became much larger in size and scope.

After fourteen years of a discretionary policy on TJLP, over the course of 2017, the new government announced a series of changes on BNDES operational policies, including the replacement of this rate. Discussions on the fiscal impact, objectives of the bank and a series of other issues were tabled throughout the process[9].

Finance Minister at that time and BNDES board members were the main authors of the new resolution which created the Taxa de Longo Prazo (TLP). The point was to align the funding cost for BNDES with the borrowing cost for the Government, the initial idea brought by Persio Arida on 90's.[10] Specifically, TLP is based on NTN-B5, a Treasury bond for five years, and the inflation rate for the last two months[11].

BNDES's President have summed up this view in 2019: *"We know that TJLP were a mechanism for elites to escape from a tight monetary policy to sustain a stable fiscal policy. This scenario changed with TLP, a rate aligned with the long term cost for the Treasury borrows from the market"* (Valor Econômico, 26.02.2019). Besides, Central Bank president also pointed TLP as a way to get a more competitive credit market along a series of proposals to foster competition on financial markets (Agenda BC+)[12]. He said: *"TLP will be the reference rate for BNDES, turning monetary policy more efficient and contributing to a lower structural interest rate for the economy and a more strong private capital market"* (Estado de São Paulo, 03.04.2018). The same idea was presented by Report from BCB which stated that TLP was a necessary condition to get a lower final interest rate for industry and consumers.[13]

As we can see, this legislation change is in line with a broad attempt by the government to get a more competitive private credit market on Brazil. Policy makers openly announced as one of the main objectives of this reform to change the conduct on banking industry. In this sense, this article is a first attempt to consider the effects of TLP on the BNDES' financial intermediaries margins on a major credit line (Finame) for small and medium firms.

3 Model

Empirical relationship between basic interest rates and funding rates on loan spreads is motivated using a standard imperfect competition model for loans (FREIXAS; ROCHET, 2008; VANHOOSE, 2017). The market is made up of N banks. Each bank is an institution engaged in intermediation activities, i.e. fund-raising (D) and lending (L). Here, the financial intermediary i is

[6] This is also a controversial period for the policies implemented by the bank. Critics question the accountability of the institution. Corruption on lending activities and bad economic decision to funding major national groups are also always pointed by harsh opponents of the BNDES. By it's turn, this institution has sustained that policies implemented along these years followed independent guidelines.

[7] PSI was a credit line which ends in 2015. Final interest rates were set by the government as fixed nominal rates covering a fixed bank spread (at 3 p.p. or 1.7 p.p. depending on the firm size).

[8] At that time, different views between the Finance Minister and the President of Central Bank were a recurrent topic on newspaper. See for example Folha de São Paulo, 2005

[9] BBC, 2017
Fazenda.Gov, 2017

[10] See *Exposição de Motivos Medida Provisória Nº 777, de 26 de Abril de 2017*

[11] $TJLP_t = (1 + IPCA_t)(1 + TLP - Pré)$. $IPCA_t$ is a average for the inflation rate for the two months before and TLP-Pré is a average for the rate for 3-Year Treasury Bond.

[12] BC+ Competitividade

[13] Relatório de Economia Bancária, Banco Central, 2017

confronted with the following operational cost function:

$$C(D_i, L_i) = \gamma_d D_i + \gamma_l L_i \tag{1}$$

And a profit expression given by:

$$\pi_i = r_{li} L_i + r M_i - r_{di} D_i - C(D_i, L_i) \tag{2}$$

Where L_i is the credit loaned at a rate of r_{li}. M_i is the bank's net position in the interbank market, paid at an exogenous rate (set by the Brazilian Central Bank) r. D_i is the total funds raised by the bank, at a rate r_{di}. The bank's liquid position can be rewritten as: $M_i = (1-\alpha)D_i - L_i$ where α is the portion of funds raised withheld by the Central Bank as compulsorily deposits. One can rewrite the profit function in terms of loan spreads $(r_l^i - r)$ and funding cost $(r(1-\alpha) - r_d^i)$:

$$\pi_i = (r_{li} - r)L_i + (r(1-\alpha) - r_{di})D_i - C(D_i, L_i) \tag{3}$$

In terms of Finame design, product (loans) is homogeneous to all BNDES's financial intermediaries. Besides, competition in quantity seems to fit more the strategic setting of this credit line given financial intermediaries may work with sales goals as anecdotal evidence suggests. Assuming Cournot competition, the demand for loans is a function of the bank's own loans L_i and the rest of the banks $r_l(L_i + \sum_{j \neq i} L_j)$ and the rate that each bank must offer (r_d) for raising funds is a function of the total volume of available resources in the market: $r_d(D_i + \sum_{j \neq i} D_j)$.

Banks select (D_i, L_i) to maximize profits below conditional on the response of each competitor (D^*_{-i}, L^*_{-i}):

$$\pi_i = [r_l(L_i + \sum_{j \neq i} L_j) - r]L_i + [r - r_d(D_i + \sum_{j \neq i} D_j)]D_i - C(D_i, L_i) \tag{4}$$

Considering only bank i, in the symmetric equilibrium case, the first order conditions can be rewritten to yield the well known market mark-up rule, or loan spread over loan rate expression, where the bank i market share is $s_i^* = \frac{1}{n}$ and the market elasticity for loans is $\epsilon_l = -\frac{\partial L_i^*}{\partial r_l}\frac{r_l}{L_i^*}$:

$$\frac{r_l^* - (r + \gamma_l)}{r_l^*} = \frac{s_i^l}{\epsilon_l(r_l^*)} \tag{5}$$

$$\frac{r(1-\alpha) - (r_d^* + \gamma_d)}{r_d^*} = \frac{s_i^d}{\epsilon_d(r_d^*)} \tag{6}$$

Focus on the relationship between the base interest rate r and the loan interest rate r_l^*, as Freixas e Rochet (2008) show, given the elasticity, in the extreme case of perfect competition ($s_i^l \to 0$), the banks pass through only the increase in r. On the other extreme given by cartel equilibrium or monopoly ($s_i^l = 1$), the cost pass through is greater than one.

Model is expanded including loans from a funding source that requires a funding cost that differ from deposits (see also VanHoose (2017)). This external organization[14] provides lending funds at a different rate $\bar{r}$. These funds are targeted as they cannot be used for other lending. Lending activities are divided in two: L_i and $L_l^{'}$, where the later are the external institution funded loans. The funding rate in the second market, $\bar{r}$, is determined by the organization. We also assume, following the institutional design of BNDES indirect loans for capital goods we study, resources are only transferred

[14] The term external organization is used to make clear that this institution does not provide direct loans to customers and thus do not compete directly with banks. The strict and high loan thresholds enforced by BNDES suggest this assumption.

to the bank balance sheet once a loan is signed, i.e., there is no "inventory" of funds for the lending bank to manage.

The profit function in this case is:

$$\begin{aligned}\pi_i =&[r_l(L_i + \sum_{j\neq i} L_j) - r]L_i + [r - r_d(D_i + \sum_{j\neq i} D_j)]D_i + [r_l^{'}(L_i^{'} + \sum_{j\neq i} L_j^{'}) - \bar{r}]L_i^{'} \\ &- C(D_i, L_i, L_i^{'})\end{aligned} \tag{7}$$

In the loan market funded by the organization, bank spreads follow the usual:

$$\frac{r_l^{*\prime} - (\bar{r} + \gamma_{l'})}{r_{l'}^*} = \frac{1}{N\epsilon_d(r_{l'}^*)} \tag{8}$$

In a comparative static analysis, under perfect competition and a finite demand elasticity, $|\epsilon_l| < \infty$, a positive shock in $\bar{r}$ will not alter the spread $(r_{l'}^* - \bar{r})$. Under imperfect competition, bank spread increase with an increase in the funding cost and this increase is greater further the market is from perfect competition.

An important question for banks involves the possibility of interdependence of asset and liability decisions (VANHOOSE, 2017). This point is more clear by dividing bank assets into loans and bonds, and bank liabilities into deposit funds (D) and non-deposit funds (N). The bank's profit function is thus altered as follows:

$$\pi_i = (r_l^i - r)L_i + (r_l - \bar{r})L_i' + (r(1-\alpha) - r_d^i)D_i + r_s S^i - r_N N_i - C(D_i, L_i, S_i, N_i) \tag{9}$$

r_s is the interest on public bonds, exogenous to bank. r_N is a function (analogous to D) of $N_i + \sum_{j\neq i} N_j$. L_i the volume of loans on the credit market without BNDES and r is the fund-raising cost given by the base interest rate; L_i' is the volume of indirect BNDES funding lines and $\bar{r}$ is the cost of fund-raising given by the TJLP.

The bank's objective is to make a selection $(L_i, L_i', D_i, S_i, N_i)$ so to maximize profit. We assume that in the bond market, the bank has no market power. In the remaining markets, it encounters a negatively sloped demand curve.

From the first-order conditions and using a demand elasticity adjusted for market share, we obtain:

$$\begin{aligned} r_L^* &= [\frac{\epsilon_L}{(\epsilon_L - 1)}](r + \gamma_L) \\ r_{L'}^* &= [\frac{\epsilon_{L'}}{(\epsilon_{L'} - 1)}](\bar{r} + \gamma_{L'}) \\ r_D^* &= [\frac{\epsilon_D}{(\epsilon_D - 1)}](r(1-\alpha) + \gamma_D) \\ r_N^* &= [\frac{\epsilon_N}{(\epsilon_N - 1)}](r + \gamma_N) \\ r_s &= \gamma_S \end{aligned} \tag{10}$$

Therefore, the economy's base rate (r) does not determine the equilibrium level of the rate charged by the financial intermediaries of BNDES, which is determined rather by $\bar{r}$, the market

elasticity and corresponding marginal cost. If we rewrite the first-order condition in market L' (BNDES funding lines) in terms of spreads $(r_{L'} - \bar{r})$, we get:

$$\begin{aligned} r^*_{L'} - \bar{r} &= \beta_1 \bar{r} + \beta_2 \gamma_{L'} \\ \beta_1 &= [\frac{1}{1 - \epsilon_{L'}}] \\ \beta_2 &= [\frac{\epsilon_{L'}}{\epsilon_{L'} - 1}] \end{aligned} \tag{11}$$

The term $\beta_2 \gamma_{L'}$ reflects the operational costs to provide these loans. We can assume that these are constant per loan amount[15].

Under this separability in the profit function of external loans and own loans, the base interest rate does not affect the loan spreads unless they represent demand shifts that alter demand for loans itself. And this is exactly what is expected for monetary policy in an inflation targeting regime. For example, consider a recessionary shock (increase in the basic rate r). In this case, given inflationary expectations, interest rates will rise. If the demand for aggregate investment is a decreasing function of the (real) interest rate then the demand for credit in the economy will fall (BERNANKE; GERTLER, 1986), including the demand for BNDES credit, even if its interest rate does not change. Other questions regarding business expectations may also play an important role here: if an increase in the base rate signals to market agents a deterioration in economic activity, the perspectives for future receipts, for a given investment, will also worsen, reducing the agent's expected profit margins. In the BNDES credit market, this trend is reflected by a leftward shift in the demand curve.

4 Empirical Strategy

Empirical approach is based on Equation 11. This model is expanded including shifts in the demand for loans to control for changes in the demand elasticity. It's also considered a two step procedure, where the optimal loan rates are adjusted over time under quadratic adjustment costs as in the labor demand and investment literature (BOND; REENEN, 2007), yielding a dynamic model of loan spreads. The same dynamic specification is seen in Almarzoqui e Naceu (2015), Maudos e Solis (2009), Turgutlu (2010). Bank i spread on period t, denoted by $r^*_{i,t} - \bar{r}_t$, is the difference between the final loan interest rate and the funding cost (interest charged by BNDES to banks that contract BNDES funded loans). Model is specified:

$$\begin{aligned} r^*_{i,t} - \bar{r}_t =& \rho_1 (r^*_{i,t-1} - \bar{r}_{t-1}) + \rho_2 (r^*_{i,t-2} - \bar{r}_{t-2}) + \beta_1 r_t + \beta_2 r_{t-1} + \gamma_1 \bar{r}_t + \gamma_2 \bar{r}_{t-1} + \\ &+ X_t^{'} \theta + \delta_i + \epsilon_{i,t} \end{aligned} \tag{12}$$

The matrix $X_{i,t} = [HHi_t; BK_t]$ measures model shifters. HHi_t is the market's Hirshman Herfindahl Index. A higher HHi increases the pass-though from costs to spread. BK_t is an indicator of capital goods production[16]. The idea here is to control for potential sector demand shocks. Both indicators can be considered endogenous (or only pre-determined) as there is a well known endogeneity between markups and concentration and, at the same time, the capital goods activity level may depend on the price of loans that finance their sale. $r^*_{i,t}$ is the final rate charged, at t, by intermediary i to the borrower of the external organization's funding line. $\bar{r}_t$ is the cost of borrowing funds from the external organization. r_t is the economy's base interest rate. Set by a external committee, $\bar{r}_t$ is exogenous with respect to individual bank shocks. r_t is exogenous, as the Brazilian Central Bank does not consider the

[15] The anecdotal evidence would appear to suggest that costs in connection with loan processing do not vary significantly over time.

[16] Series 21863: Production indicators (2012=100) – Capital goods. Avaialble on the Brazilian Central Bank's Time Series Management System.

performance of an individual bank's idiosyncratic credit performance. Therefore, $\bar{r}_t$ e r_t are exogenous as they are determined by a monetary authority that does not consider bank units individually. Thus:

$$E[\epsilon_{i,t}|\bar{r}_t, r_t] = 0 \quad \forall i, t \tag{13}$$

The difference $r^*_{i,t} - \bar{r}_t$ is the bank i spread at t. Specifically, it consists of a weighted average of the spreads charged by all of the operations carried out at t. Consider that at t the bank executed n loan operations based on a given funding line of the external organization:

$$r^*_{i,t} - \bar{r}_t = \sum_{j=1}^{n} \frac{LoanValue_{j,t} Spread_{j,t}}{TotalValue_t} \tag{14}$$

Coefficients β_1 e β_2 from Equation 12 represent the response of the bank spread to a shock on the base rate at t and t-1, respectively. Negative values indicate that a general recessionary shock (increase in r) in the economy, controlled by the market structure, by the cyclical variable represented by the BK production and by direct funding cost (TJLP), is associated with lower spreads. This would be consistent with the previous model.

From the standpoint of the external organization, γ_1 and γ_2 reflect the sensitivity of the spreads to changes on the rates charged to banks at t and $t-1$, respectively. Specifically, given the linear model, the cost pass-through to prices is $\gamma_1 + 1$ in the short term and $\frac{\gamma_1+\gamma_2}{1-\rho_1-\rho_2}$ in the long term. Because we are considering market equilibrium, the goal is to test whether $\frac{\gamma_1+\gamma_2}{1-\rho_1-\rho_2} > 0$, i.e. whether the transfer of intermediaries is greater than a given shock to the respective funding cost.

Finally, indicators with invariant effects over time and idiosyncratic to intermediaries are represented by δ_i. Here, we control for certain characteristics of banks, e.g., private and state enterprises. More importantly, a fixed effect may accommodate heterogeneous spreads among banks.

To capture the effects on banking margins after the introduction of TLP in 2018, Equation 12 is changed:

$$\begin{aligned} r^*_{i,t} - \bar{r}_t = I_t + \rho_1(r^*_{i,t-1} - \bar{r}_{t-1}) + \rho_2(r^*_{i,t-2} - \bar{r}_{t-2}) + \beta_1 r_t + \beta_2 r_{t-1} + \gamma_1 \bar{r}_t + \gamma_2 \bar{r}_{t-1} + \beta^*_1 I_t \bar{r}_t + \beta^*_2 I_{t-1} \bar{r}_{t-1} + \\ + X'_t \theta + \delta_i + \epsilon_{i,t} \end{aligned} \tag{15}$$

$$\bar{r}_t = \begin{cases} TJLP & \text{if } t < 2018 \\ TLP & \text{if } t > 2017 \end{cases} \tag{16}$$

$$I_t = \begin{cases} 0 & \text{if } t < 2018 \\ 1 & \text{if } t > 2017 \end{cases} \tag{17}$$

The main point is that the funding cost variable $\bar{r}_t$ on the model until 2017 is independent of the base rate given discretionary control from the Government. After 2017, it's not possible to assume this. It's not clear which relationship between short term (r_t), set by the Central Bank, and the market long term interest rates ($\bar{r}_t$) will prevail. Also, this is a major dubious point for macroeconomic literature.

In general, it's considered that Central Bank controls the short term interest rate. As the aggregate demand (investment and consumption) is a function of the long term interest rate in a standard New Keynesian model, monetary policy has greater efficiency as more sensible the long term interest rate is to the short one (CAMPBELL; SHILLER, 1991). Given a simple version from Mankiw e Summers (1984):

$$r^{(2)}_t = \omega + \lambda r^{(1)}_t + (1 - \lambda) E_t r_{t+1} \tag{18}$$

The expectation hypothesis is based on the assumption that the long term interest rate is an average sum of short term interest rate plus a risk premium (ω). Above, this is the case with $\lambda = 1/2$. Given a stable expectation for r_{t+1}, with $\lambda > 1/2$, long term interest rate over reacts to short term. This would be the case with a myope expectation. However, in all cases, there is a positive relationship and this is the point that matters for the banking model.

Given a term structure as above, as the short term interest rate determines the behavior of the long term, we must have β with the same sign than γ.

Note that compared to the period under TJLP, monetary policy is expected to be much more effective with TLP on BNDES credit market liquidity, condition on the same dynamics for banking margins. Under this assumption, the development bank, once cited as a counter cyclical institution to sustain loan operation under tight monetary policies, no longer exists.

Also, it's important to note that even after TLP we can identify the effect of credit demand cyclical effect and the funding cost on banking margins as the two rates, although related, are different. However, as the new policy (TLP) affected all the banks at the same time, we are not able to estimate a counterfactual for TLP.

Thus, in order to get a sense about the changes on margins after the new legislation, I estimate the model for the whole sample period (2002-2019) condition on a level change on margins with a dummy I_t and a change on funding cost coefficient after TLP.

Estimates of Equation 15 by OLS and Fixed Effect Models would generate inconsistent estimators given a auto regressive term and a fixed effect on right side (*dynamic painel bias*). Although they given inconsistent estimators, both OLS and Fixed Effect Model are informative for the upper and lower bound for the parameters from the equation above (BOND; REENEN, 2007). A model to control for the problems posed by the auto regressive and the fixed effect component on 15 is given by the GMM estimator (ARELLANO; BOND, 1991). Two assumptions are required: the validity of the instruments set and that no auto correlation exists. For the validity, we consider the J-Hansen test whose null hypothesis is the validity of all restrictions for the over-identified model (CAMERON; TRIVEDI, 2009). Finally, Arellano e Bover (1995), Blundell e Bond (1998) suggested the Sys-GMM to circumvent the bias for small samples if dependent variable has a high persistence dynamic. It's particularly the case here given a high persistence on financial margins found on literature (ALMARZOQUI; NACEU, 2015; MAUDOS; SOLIS, 2009). Also, for flexibility, I do not impose any restriction on the variance of $\epsilon_{i,t}$. Therefore, a benchmark model considered here is GMM-Sys Two Step (SYS 2 GMMM)[17]

5 Data

Information on indirect BNDES operations is provided through its Download Center, which contains data on the value, interest rates, spreads and final cost to borrowers under each contract executed between intermediaries and customers. Based on these data, we calculated bank level average spreads from Equation 14; as well as the market share of each institution in each period and the market HHi at each t. Indirect operations encompass the main funding lines (BNDES Finame, BNDES Finame Agrícola, BNDES Finame Leasing and BNDES Automático). The first ones one account for a significantly share and, for this reason, is the subject of the present analysis. In fact, it represented 84% of all operations pegged to the TJLP in the period.

BNDES Finame is "Funding through authorized financial institution intermediaries for the production and acquisition of new domestically manufactured machinery, equipment, and computer and automation goods, as approved by BNDES"[18].

Only loans which the funding cost was pegged to the TJLP or TLP were considered. We use monthly data from 2002 to October 2019, aggregated to quarterly data, given the frequency of base interest changes. Over most of the data period, the Central Bank of Brazil met to decide base interest

[17] The one step estimator (SYS 1 GMM) considers the homocedasticity assumption.
[18] https://www.bndes.gov.br/wps/portal/site/home/financiamento/finame

rates in six weeks intervals, longer than a month.

Information on the basic interest rate (COPOM Series) and the capital goods production index (Series 21863: Production Indicators (2012=100) – Capital goods) was obtained from the Brazilian Central Bank available on its Time Series Management System.

6 Results

A first look on summary statistics for the period with TJLP and TLP on Table 1-2 gives a scenario where the margin for financial intermediaries fell lesser than the funding cost. This means that the price cost margin (PCM) almost triple on average (1.77 with TLP and 0.65 with TJLP). The economy base rate and funding cost reduces by more than 2 (Copom from 14.52 to 6.38; TJLP with 7.83 and TLP with 3.02). Production Index (BK) illustrates the recession on the economy with a Minimum (50.5) on 2015 when the GDP fell 3.4%. It's also possible to see stagnation for 2018 and 2019 (on average a grow rate below 1.0%)[19] with a fell on BK index from 81.0 to 78.15 on average.

Besides, comparing the funding cost for BNDES with the estimated funding for Treasury[20], convergence has not ccurred yet. There is a difference between these rates and thus a subsidy could still be in practise for BNDES Finame loan operation. Also, it's important to note that over the period for TLP (2018, 2019) in some months it was registered deflation which amplify the fell for the new funding cost.

I also consider the evolution of margins, price cost margins (PCM) and maturity for all loans by year for the whole sample period separated by the size of the client (industry). As we can see on Fig 2-3, the trend for margins and PCM are the same for all categories considered. In addition, the maturity profile did not change before and after TLP.

For a consistency relevant market definition, it's important to consider the loan operation only for small and medium firms (*Micro, Pequena e Média*). I weighted for the loan size the average for margins and PCM's for each bank in each month since 2002 on Fig. 4. Note that the margin for financial intermediaries has not changed as much as the PCM had after TLP. The market structure variable for the market share distribution (HHi) also has not changed. In addition, we can see the turbulent period for the market along the years of 2009 and 2014 given the PSI credit line program. [21]

Tabela 1 – Descriptive Statistics - BNDES Finame with TJLP, 2002-2017

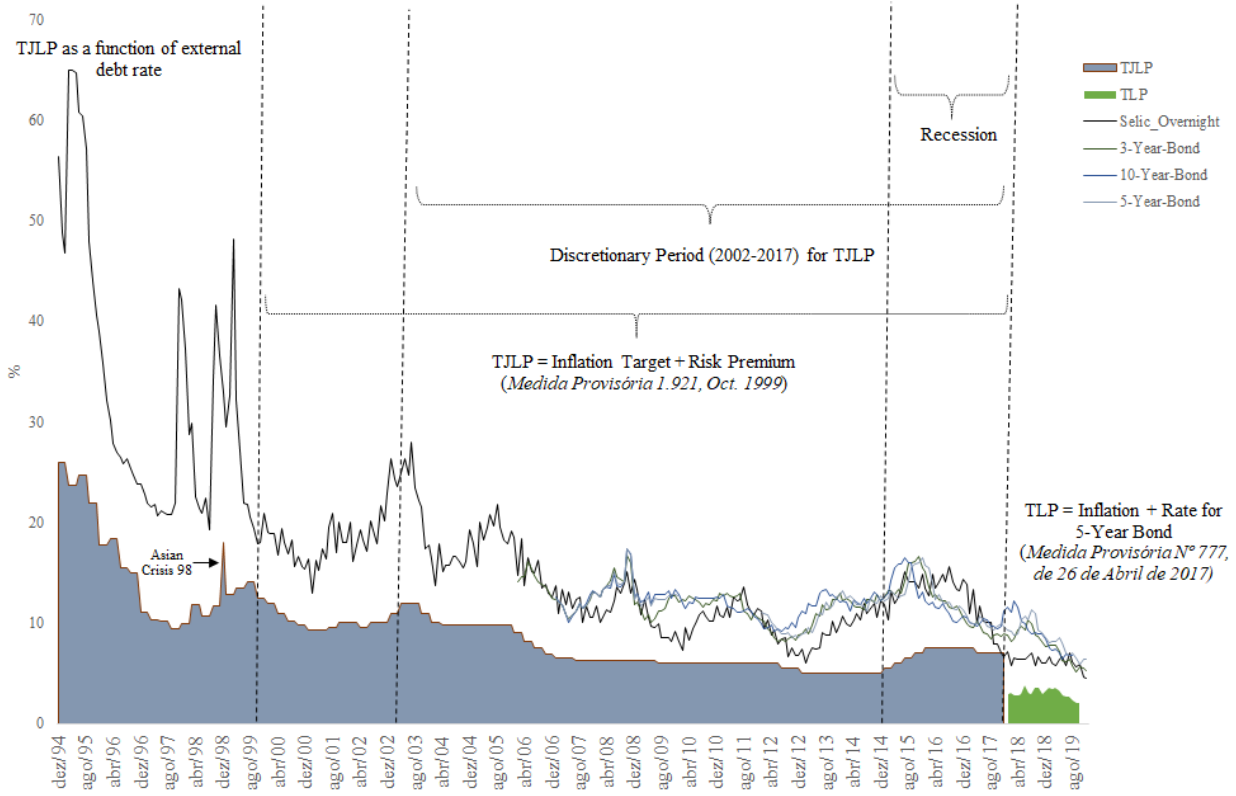
	Margin	PCM	Copom	TJLP	Market Share	HHi	BK
Mean	4.90	0.65	14.52	7.83	0.04	0.14	81.0
Standard Deviation	1.35	0.22	4.54	1.95	0.08	0.05	19.78
Min	0.9	0.125	7.0	5.0	0.00	0.07	50.4
Max	14.48	2.07	26.32	12.0	1.0	1.0	127.1
N	4231	4231	4231	4231	4231	4231	4231

First column is Bank's margin in loan operation on FINAME. PCM is the price cos margin, the ratio between margin and the funding cost (TJLP). Copom is the base rate set by Central Bank.
TJLP is the funding cost from BNDES until 2017.
HHi is the Herfindahl-Hirschman Index.
BK is a monthly index of Capital Good production (Series 21863, Central Bank of Brazil)

Although it's not possible to get a counterfactual for TLP, I consider the model from the previous section to get a estimate on the influence of this regulatory change on the financial margins. First, on Table 3, I estimate Equation 15 for the whole sample period (2002-2019). I_{TLP} is significant and positive for all models considered except for the OLS case. Condition on the funding cost, base rate and production variables, this means that on average financial margin increased in 0.7 p.p after TLP, considering the benchmark models (GMM). On the long run, the increase is of $\frac{0.7}{1-0.270} = 0.97$ p.p.

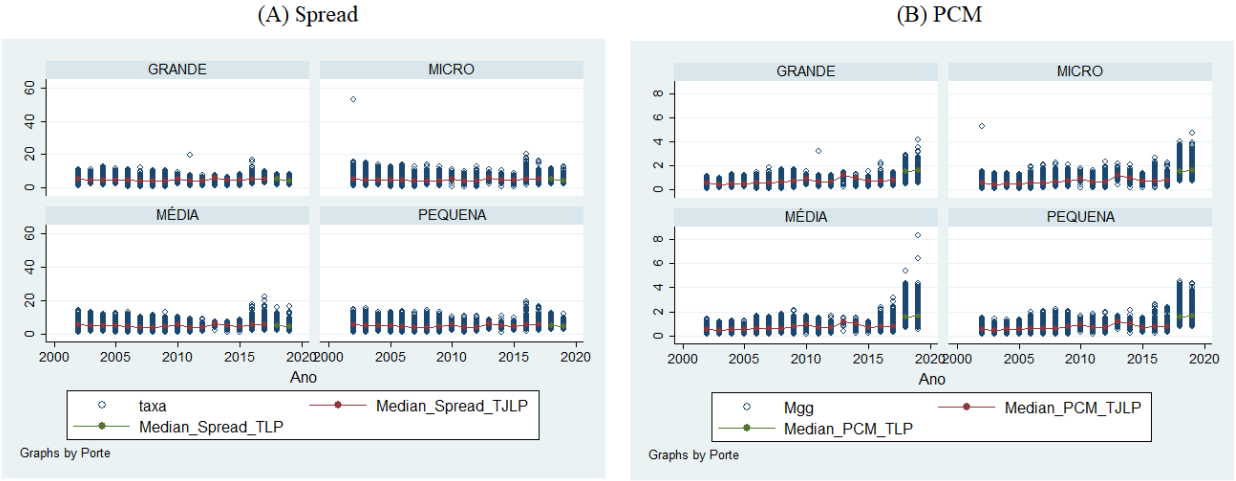
[19] See in <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=BR>
[20] Average Rates for 3,5 and 10 years for Brazilian Treasury Bonds reported by Bloomberg
[21] I always included a control dummy for the period for the models estimation. Results are robust.

Figura 1 – TJLP and TLP History: End of Subsidy?



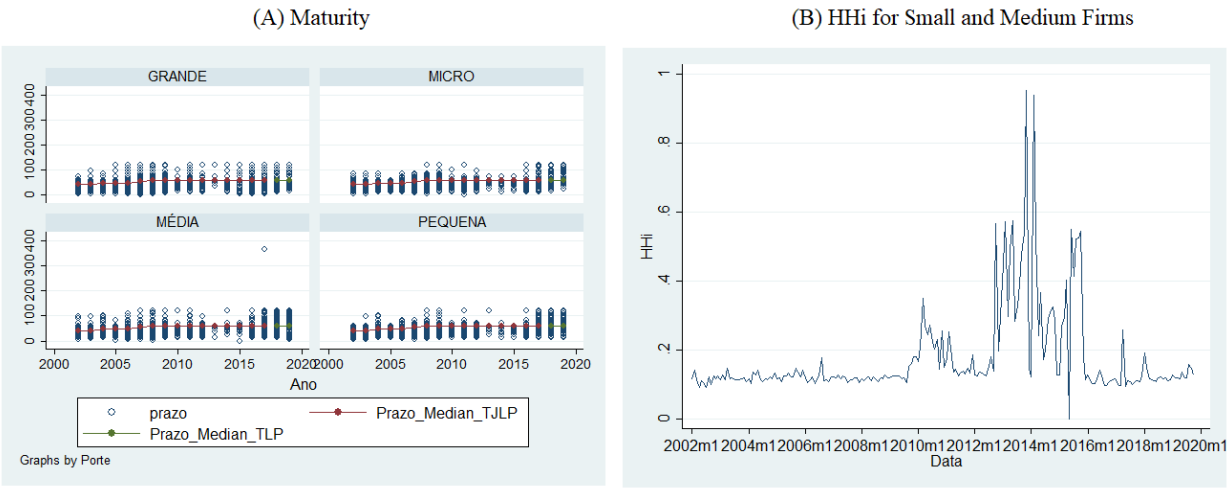
Source: Time series for TJLP is available on BNDES Website and the base rate (copom) comes from Central Bank Data Time Series (Series Number 4189). TLP is the sum of the "TLP-Pré"available on BNDES site and the inflation rate for the month which is the IPCA Table available by IBGE (Tabela 1737). Rates for 3, 5, 10 Year Brazilian Treasury Bonds are from Bloomberg.

Figura 2 – Finame Margins and PCM, 2002-2019



Source: Spreads are the margins for financial intermediaries on BNDES Finame based on the data took from Central dos Dowloand (BNDES WebSite). PCM are the ration between Spreads and the funding cost (TJLP or TLP) for financial intermediaries on BNDES Finame based on the data took from Central dos Dowloand (BNDES WebSite).

Figura 3 – Finame Maturity and HHi, 2002-2019



Source: Maturity for loan operation and HHi on BNDES Finame based on the data took from Central do Download (BNDES WebSite).

Figura 4 – Margin and PCM for Small and Medium Firms by Bank, 2002-2019

Source: Based on BNDES Finame data took from Central dos Dowloand (BNDES WebSite).

For the production index (BK) results are robust across the sample period. The coefficient is negative for t indicating the a intra-sector positive demand shock is associated with a lower financial margin.

Note that the auto regressive ($Margin_{t-1}$ and $Margin t-2$) estimates coefficients are robust across all the models and sample periods suggesting a high persistence banking margin in line with previous results (ALMARZOQUI; NACEU, 2015; MAUDOS; SOLIS, 2009).

Besides, the most important result is related to the funding cost coefficient. For $Fund$, on average, we get that a change on 1 p.p on the funding cost means a higher - 0.24 for SYS 2 GMM - financial margin on the short run. For the long run, $\frac{0.24}{1-0.270} = 0.32$.

But this coefficient is lower with TLP which can be seen by the negative coefficient of the interaction variable $I_{TLP}Fund$ on time t for all models except the SYS-2-GMM (significant for $t-1$). In fact, when we consider only the sample period of TLP, on Table 4, the funding cost coefficient is negative just like it was obtained for the base rate (Copom) over 2002-2017, as we can see on Table 5. This is exactly in line with a term structure with a positive correlation with short and long term rates. In addition, the base rate lost his significance for the period 2018-2019. This not means that Central

Tabela 2 – Descriptive Statistics - BNDES Finame with TLP, 2018-Oct. 2019

	Margin	PCM	Copom	TLP	Market Share	HHi	BK
Mean	5.24	1.77	6.38	3.02	0.03	0.13	78.15
Standard Deviation	1.17	0.49	0.50	0.47	0.06	0.02	7.25
Min	2.94	0.94	5.38	1.99	0.00	0.00	63.2
Max	10.31	4.17	13.58	3.84	0.38	0.19	89.0
N	588	588	588	588	588	588	588

First column is Bank's margin in loan operation on FINAME. PCM is the price cost margin, the ratio between margin and the funding cost (TLP). Copom is the base rate set by Central Bank.
TLP is the funding cost from BNDES since 2018.
HHi is the Herfindahl-Hirschman Index.
BK is a monthly index of Capital Good production (Series 21863, Central Bank of Brazil)

Bank does not affect the financial margins from BNDES operations given that the short term (base rate) still influences the long term which for its turn affects TLP.

These results point for a important finding on the relationship between market rates and subsidised funding cost for banking industry. Over TJLP period (2002-2017), the funding cost variable was independent of the short one (set by the Central Bank). In a concentrated market structure, with the price-cost-margin as a function only of the demand elasticity, the pass-through is positive (greater than 1 given $TJLP > 0$). However, when there is a direct influence of the base rate on the funding cost for banking, as in any traditional model for banking activity, this coefficient captures a mixed of demand (for credit) and cost variation. In the case of BNDES credit market, results for the TLP coefficient pointed for financial margins negative correlated with the base rate.

Therefore, for the business cycle, under a inflation target regime, this means that financial margin, at a certain degree, offset the monetary policy. This is line with the motivation of a part of the literature related to alternative instruments for macro policy post-08 crisis. Particularly, the idea of a credit subsidy was brought as way to amplify the macroeconomic policy which for many was always restricted to the monetary policy through the base rate (LUCAS, 2016; CORREIA et al., 2018; CHRISTIANO; EICHENBAUM; REBELO, 2011; CORREIA et al., 2013). For the case of banking industry on BNDES credit lines, as I pointed before, margins were sensible to the change on interest policy for the funding cost as they compensate changes on this variable after the introduction of TLP. This brings the question about the root cause of the difference in dynamics observed on this financial margins when there is subsidy on the funding cost as it was the case of TJLP. However, margins dynamics still is a field on macro with many questions and a few answers as illustrated by Blanchard (2008): "How markups move, in response to what, and why, is however nearly *terra incognita* for macro ... [W]e are a long way from having either a clear picture or convincing theories, and this is clearly an area where research is urgently needed."

Tabela 3 – BNDES Finame: Models, 2002-2019

Variable	OLS	FE	SYS 1 GMM	SYS 2 GMM
Margin_{t-1}	0.489***	0.412***	0.402***	0.353
Margin_{t-2}	0.362***	0.291***	0.235***	0.270***
I_{TLP}	0.452	0.680***	0.731***	0.716*
Fund_t	0.013**	0.043*	0.048*	0.243*
Fund_{t-1}	0.028	0.036**	0.040	-0.054
$\text{I}_{TLP}Fund_t$	-0.079***	-0.108**	-0.131*	-0.395
$\text{I}_{TLP}Fund_{t-1}$	-0.077	-0.099*	-0.080	-0.174**
Copom_t	-0.004	0.008	0.013	0.038
Compom_{t-1}	-0.029	-0.051**	-0.059**	-0.097**
BK_t	-0.295***	-0.426***	-0.444***	-0.077
BK_{t-1}	0.021	-0.072	-0.089**	0.302*
HHi_t	0.871***	1.300***	1.620**	1.563*
State	0.080			
Constant	1.831***	3.435***	3.855***	0.00
N	3589	3589	3589	3589
R^2	0.682	0.498		
Hansen			163.161	163.161
AR(1) pvalue			0.000	0.125
AR(2) pvalue			0.064	0.630
F	402.683	290.116	124.837	611.01

Note: *p<.1; **p<.05;***p<.01
The 2 step estimator (SYS 2 GMM) do not impose any restriction on the error variance matrix.
SYS 1 GMM imposes homecedasticity.
BK is a industrial production for machinery.
AR(k) test for autocorrelation of residuals.
Hansen null hypothesis is validity of over identification of the restrictions. In all GMM models, this was not rejected.
$Fund$ is equal to $TJLP$ until 2017. Since 2018, equal to TLP.
I_{TLP} is a dummy variable for 2018 and 2019 when TLP began.
$IFund$ is a interaction between I_{TLP} and $Fund$.

Tabela 4 – BNDES Finame: Models, 2018-2019

Variable	OLS	FE	SYS 1 GMM	SYS 2 GMM
Margin_{t-1}	0.400***	0.148***	0.241***	0.323
Margin_{t-2}	0.376***	0.185***	0.213*	0.221
TLP_t	-0.106	-0.166	-0.255***	-0.172**
TLP_{t-1}	0.033	-0.052	0.013	0.038
Copom_t	-0.173	-0.443	-0.229	0.028
Compom_{t-1}	0.289	1.040**	0.747	0.289
BK_t	-0.273	-0.277	-0.336	-0.074
BK_{t-1}	-0.474	-0.809**	-0.828***	-0.505*
HHi_t	2.860	0.613	1.123	1.559
State	0.122			
Constant	3.403	4.864*	5.095*	2.946
N	436	436	436	436
R^2	0.565	0.163		
Hansen			22.345	19.754
AR(1) pvalue			0.000	0.122
AR(2) pvalue			0.597	0.900
F	28.527	8.587	31.283	7.993

Note: *p<.1; **p<.05;***p<.01
The 2 step estimator (SYS 2 GMM) do not impose any restriction on the error variance matrix.
SYS 1 GMM imposes homecedasticity.
BK is a industrial production for machinery.
AR(k) test for autocorrelation of residuals.
Hansen null hypothesis is validity of over identification of the restrictions. In all GMM models, this was not rejected.

Tabela 5 – BNDES Finame: Models, 2002-2017

Variable	OLS	FE	SYS 1 GMM	SYS 2 GMM
Margin_{t-1}	0.601***	0.472***	0.468***	0.218***
Margin_{t-2}	0.258***	0.169***	0.115**	0.202***
Copom_t	-0.055***	-0.059***	-0.050***	-0.052***
Copom_{t-1}	-0.012	-0.039**	-0.037**	-0.052***
TJLP_t	0.298***	0.337***	0.278***	0.262***
TJLP_{t-1}	-0.180***	-0.140***	-0.097*	-0.038
HHi	0.767**	1.160***	1.052**	1.282**
BK_t	-0.947***	-1.041***	-0.925***	-1.079***
BK_{t-1}	0.468	0.271	0.143	0.07
State	-0.018			
Constant	2.786***	4.852***	5.155***	6.811***
N	1560	1560	1560	1560
R^2	0.68	0.488		
Hansen df			299	299
Hansen			77.698	67.799
AR(1) pvalue			0.000	0.001
AR(2) pvalue			0.395	0.018
F	195.658	156.179	60.012	28.923

Note: *p<.1; **p<.05;***p<.01
The 2 step estimator (SYS 2 GMM) do not impose any restriction on the error variance matrix.
SYS 1 GMM imposes homecedasticity.
BK (capital good production index) and HHi are treated as endogenous variables in the model.
State is a dummy variable for state owned banks.
AR(k) test for autocorrelation of residuals.
Hansen null hypothesis is validity of over identification of the restrictions. In all GMM models, this was not rejected.

7 Conclusion

Public debate about the end of TJLP and its replacement by TLP has been centered on fiscal issues regarding the impact of the subsidized rate, with little attention to the role played by BNDES on banking competition. This article analysed the effect of this regulatory change on financial intermediaries banking margins from a major BNDES' credit line (Finame).

As it was pointed on the institutional section, the basic idea behind TLP was to equalize the funding cost for BNDES and the borrow rate for Treasury considering bonds with similar maturities to the development bank's loan portfolio. In addition, in line with a broad policy to enhance banking competition on credit markets (Agenda BC+), Central Bank have presented the end of subsidised rates as a necessary condition for low final interest rates for industry and consumers.

However, after TLP, the average price-cost-margins almost triple reaching 1.77 p.p compared to 0.65 on the period with TJLP. Although is not possible to get a counterfactual for TLP, I found a increase of 0.7 p.p on financial intermediaries' margins for the period from 2018 until October 2019, using a dynamic panel data, condition on the funding cost, the base rate, production index for intra-sector demand shock and fixed effect for banks. In addition, a major result is the sign change for the coefficient of the funding cost variable. Between 2002 and 2017, a change on TJLP was associated with a same sign variation on the margins as expected in a concentrated market structure *à la Cournot*. Under TLP, a rate reflecting the long term funding for the Treasury, the coefficient is negative as I have found for the coefficient of the base rate between 2002 and 2017. This result could be interpreted in line with a traditional term structure where the short term rate set by the Central Bank influences the long term rate for Treasury bonds, given a stable market expectation. In this article, results pointed for financial margins offsetting changes in the funding cost on a major credit line from BNDES.

Finally, as the data and history suggest, the volatility of the Copom rate was greater than that of the TJLP. Thus, we need to be cautious about drawing overly generalized conclusions from the results presented here regarding the spreads's expected future behavior. Specifically, market structure elements (market share and it's distribution, rivalry and entry barriers) may vary considerably if the funding cost from BNDES converges to the average historical Copom rate, for example. In this sense, it's important to consider that a eventually reverse on the recent negative trend for Copom would directly affect the funding cost for BNDES. As we can see on Table 1, the average base rate is almost double the TJLP. A high rate level could act as a significant barrier to entry for bank intermediaries on BNDES credit lines. This is presented on other credit markets (without BNDES) where there is evidence of higher concentration, low rivalry and greater spreads. This kind of market structure is sustained by entry barriers based on high levels of funding costs to new financial institutions.

Therefore, for the policy makers interested in designing a more competitive banking industry, it's important to consider the effects presented in this article as a cautionary note from a major credit line on the country. Besides, in times where the role played by BNDES is at a center of public debate, ignoring its influence on banking competition seems not reasonable given the objectives set by the government to develop a more efficient and competitive credit market for industry.

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