Does Loan Portability Promote Bank Competition?*

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Abstract

Loan portability has been recommended as a significant instrument for promoting competition in the banking industry. In 2014, the Brazilian Central Bank (BCB) introduced a regulatory framework to facilitate consumer loan portability. In this study, we explore the spatial concentration of local banking in Brazil to investigate how this institutional change affected local credit markets. Our findings provide robust evidence that credit portability led to a reduction in interest rates and a surge in credit volume, primarily benefiting the categories of loans most affected by the regulatory change.

Keywords: bank competition, loan portability, household consumption

JEL codes: G21, E44, E58, G53

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1 Introduction

Consumer credit penetration has increased steadily over recent decades. There are currently more than $\$41$ trillion U.S. dollars in household debt globally, equivalent to around 40% of GDP across countries[1]. In Brazil, banking credit has increased from around 30% of GDP in 2007 to 53% in 2022, with household credit currently accounting for almost 60% of total credit (figure C2, in appendix C). The country experienced a significant economic expansion from 2005 to 2014. Loans to households were boosted by several legal reforms of the financial system and government programs targeted to increase credit availability to a significant fraction of the Brazilian population[2].

The banking sector assumes a central role in the economy, as elucidated by Bernanke (1983), by bridging the gap between creditors and borrowers. Through financial intermediaries, businesses can channel investments into technology, infrastructure, machinery, and equipment, enabling expansion and payroll management. Households can secure durable assets like homes and vehicles while effectively managing consumption during adverse economic conditions. Essentially, banks create liquidity by transforming otherwise illiquid assets (such as a borrower's future ability to repay a loan) into liquid ones in the form of bank deposits.

However, given the inherent risks associated with financial intermediation and the value they provide in this process, banks levy a cost for their services. This cost is typically manifested in the form of the banking spread, signifying the difference between interest rates applied to loans and those associated with deposits.

One significant factor contributing to Brazil's notably high banking spread is the country's inefficient enforcement of collateral rights compared to international standards. Notably, Brazil has consistently ranked low in the World Bank's "Strength of Legal Rights Index" since 2013 (Figure C4, in appendix C), underscoring Brazil's need for legal reform[3].

[1]Calculations based on data from the Global Debt Database by the International Monetary Fund for 82 developed and developing countries with available data for 2016.

[2]Brazil introduced legal changes to facilitate the repossession of collateral by financial institutions ("Lei de Alienação Fiduciária"), a new bankruptcy law, and a new law on payroll lending.

[3]The "Strength of Legal Rights Index" gauges the extent to which collateral and bankruptcy laws safeguard the interests of borrowers and lenders, facilitating lending in the process. The

Market power wielded by banks also plays a pivotal role in driving elevated banking spreads in Brazil. Despite advanced technology and robust regulation, the country's banking sector remains highly concentrated. Figure 1 reveals the distribution of the Herfindahl-Hirschman index (HHI) – a standard gauge of market concentration – that evaluates bank concentration within each Brazilian municipality for 2012, 2014, and 2016. During this period, the distribution of the HHI index moved to the right, implying a shift towards greater bank concentration. Additionally, roughly 80% of the outstanding credit to businesses and households during this timeframe can be traced back to just five banks in the country (Figure 1, Appendix C).

Encouraging competition within the banking sector is paramount in the current financial landscape. To address this, the Brazilian Central Bank (BCB) implemented a crucial measure to promote competition – Resolution No. 4,292, enacted on December 20, 2013, and enforced in May 2014. This resolution introduced a regulatory framework to facilitate consumer credit portability, fundamentally allowing borrowers to settle an existing credit arrangement with one financial institution by initiating a new one with a competing entity.

Resolution No. 4,292 marked a significant evolution in the portability process, which had its inception back in 2006 through Resolution No. 3,402, though its efficacy was limited. The revised rules brought about more transparency and standardization in procedures, mandating the use of an electronic platform developed by the BCB for the exchange of credit transaction information between the two involved financial institutions. Moreover, this resolution imposed strict timelines and penalties for financial institutions failing to provide timely credit information. Crucially, it stipulated that consumers should not bear any costs related to credit portability[4].

Analyzing the data exclusively from ported loans between the effective date of Resolution No. 4,292 in May 2014 and December 2016, an overwhelming majority, exceeding 99.9% of requests made and 97.9% of the balance, pertained to payroll loans. Payroll loans are a form of credit where repayment occurs via fixed monthly deductions from payroll (applicable to formal employees and civil servants) or the retiree's social security benefit. This arrangement inher-

index spans from 0 to 12, with higher scores indicating more favorable lending conditions.

[4]In the case of housing loans, the borrower must pay the cost of transferring the property to the new bank.

ently lowers the risk of defaults, which is reflected in the form of reduced interest rates[5].

This institutional change offers a quasi-experimental design to assess the causal effects of greater bank competition on interest rates and the volume of loans in the country. We focus only on payroll loans, as it is the most representative type of credit among portability requests made.

To disentangle the effect of portability on the local credit landscape, we deploy an empirical differences-in-differences methodology. This approach involves comparing changes in outcomes between markets affected by portability and those left untouched. We classify a municipality as being influenced by portability (i.e., treated) if it boasted at least two distinct banks when the resolution was announced back in December 2013. This condition was pivotal to allow customers to actively "hunt" for more favorable loan terms, including lower interest rates. We assume that portability did not impact local bank competition in markets with only a single bank or none at all. Our estimates hinge on the identifying assumption of parallel trends, signifying that, in the absence of this regulatory shift, the treatment and control groups would exhibit comparable outcomes over time, contingent on their respective market characteristics.

Our empirical findings review a reduction in interest rates of approximately 0.95 percentage points (p.p.) in municipalities with more than one bank in operation (i.e., treated group) compared to those with only one bank or none at all (i.e., control group). This reduction is statistically significant and economically relevant, particularly considering that the average spread was around 18.70 p.p. Consequently, this regulatory shift in isolation translated to roughly 5% decline in the average spread. These results are robust to different specifications and sub-samples.

Interestingly, our regressions show that the portability regulation was more effective in reducing interest rates in municipalities with lower banking competition, that is, in localities where the HHI index was higher. Thus, we see that the reduction in rates in municipalities with higher HHI index was around 1.022 - 1.039 pp compared to a reduction of 0.8 - 0.845 in localities with a HHI index below or equal to 5,109.

[5]During the period from May 2014 to December 2016, the average interest rate for payroll loans stood at 27.9%, a significant contrast to the average interest rate for personal loans, which was notably higher at 117.3%.

Our findings also suggest that the allocation of resources was significantly heterogeneous. The evidence strongly supports that the loan portability regulation played a role in diminishing interest rates for retirees, albeit to a lesser extent than the reduction observed for the overall sample. In stark contrast, the decline in payroll lending rates for civil servants was three times more pronounced than for retirees. Furthermore, our analysis highlights middle and high-income individuals as the primary beneficiaries of the portability regulation. Within these demographic segments, payroll loan interest rates experienced a substantial decline of approximately 2.5 p.p., in sharp contrast to the 1.2 p.p. decrease observed among low-income individuals. Thus, our findings reveal significant disparities in interest rates within borrowing categories. These disparities are likely exacerbating the vast income inequality prevalent in the country.

In summary, our study furnishes robust and economically relevant evidence that credit portability exerted a favorable influence by lowering interest rates and enhancing loan volumes for credit types that reaped the most benefits from the regulation. These findings are consistent with the predictions made by the classic industrial organization theory, which posits that more rivalry within a market would result in decreased interest rates and enhanced loan accessibility through movements along the demand curve. Moreover, we emphasize that these advantages were not evenly distributed among all borrowers. We posit substantial untapped potential within the realm of portability, mainly due to its limited awareness among the general populace. This potential could be harnessed further with the advent of Open Banking[6], which has the potential to reduce the informational advantages held by incumbent institutions and streamline the borrower's quest for superior offers.

Related Literature This paper contributes to a broader body of literature that uses microdata to investigate macroeconomic and household finance matters, such as Buera et al. (2023), Cavalcanti et al. (2021), Fonseca and Van Doornik (2022), and Garber et al. (2020).

Traditionally, the banking industry has been depicted as perfectly competitive, with the impact of monetary policy on loan supply primarily mediated

[6]Joint Resolution 1, of May 4, 2020. Defined as standardized sharing of data and services through openness and integration of systems. Open Banking will allow customers to share their data to get better products and services.

through regulatory mechanisms like reserve or capital requirements, as articulated by Bernanke (1983). However, recent literature suggests that the structural organization of the banking sector itself may wield influence over the transmission of monetary policy (Drechsler et al. (2016)) as well the market power of banks (Wang et al. (2020)).

Moreover, James A. Schmitz (2016) delves into the multifaceted realm of monopolistic conditions across various industries. The author emphasizes that low-income households disproportionately bear the costs associated with monopolies. Against this backdrop, the issue of competition in the banking system becomes a pertinent concern, particularly given that banks operate as multiproduct firms within an oligopolistic landscape. Thus, competition in the banking system is desirable for efficiency and maximization of social welfare.

Therefore, this article also relates to the impact of competition and banking market power on the economy. This paper builds on the findings of Joaquim and van Doornik (2019) that show that a reduction in bank competition increases lending spreads (the difference between lending and deposit rates) and decreases credit volume. Intriguingly, the decline in credit volume primarily stems from fewer loans in equilibrium rather than smaller loan sizes. Furthermore, they find that these impacts on credit markets reverberate through the real economy; a 1% increase in spreads leads to a 0.2% decline in employment.

Our paper also aligns with an expanding body of literature exploring the credit-driven household channel. This channel posits that credit supply expansions, driven by household demand, enable households to borrow and consume more, boosting overall household demand. Notably, credit expansion through the household demand channel tends to be inflationary. It promotes employment growth in the non-tradable sector relative to the tradable sector, as elucidated by Mian and Sufi (2018) and Mian et al. (2020).

In the context of the new portability resolution, which streamlines the transfer of consumer credit across financial institutions, the anticipated reduction in the opportunity cost of switching banks is poised to elevate competition in this market, leading to reductions in interest rates and spreads. Policies designed to foster rivalry within the banking industry are expected to catalyze the expansion of the credit market and spur economic activity. In this regard, the telecommunications industry serves as a relevant parallel, with several studies conducted in different countries (e.g., Lee et al. (2006), Shi et al. (2006), and

Viard (2007)) converging on the conclusion that portability bolsters competition and drives down prices in telecom markets. To the best of our knowledge, Azevedo et al. (2019) stands as the sole study that has evaluated the implications of credit portability for the Brazilian banking industry, finding that credit spreads for credit types susceptible to portability witness significant reductions compared to credit spreads for other credit types unaffected by the new legislation.

Lastly, our study is also intertwined with discussions surrounding the impact of regulatory and technological advancements on the structure of financial markets to simplify choices and deliver enhanced benefits to consumers (José Ignacio Cuesta (n.d.), Azevedo et al. (2019)).

The rest of the paper is organized as follows. In the next section, we provide some institutional background that will be important for the rest of the paper. Section **??** describes the empirical analysis and the framework. Section **??** explores the effects of loan portability on the economy and presents robustness exercises. Finally, section **??** concludes with some policy implications.

2 Institutional Background

This article uses a comprehensive consumer-level credit registry to examine the importance of loan portability on credit markets. Our analysis explores a regulatory change in Brazil, which became effective in May 2014, and facilitated consumer loan portability. Below we describe the data used in this study as well as the institutional change.

2.1 Data Sources

Credit Registry. Our primary data source is the credit registry known as the Sistema de Informação de Crédito (SCR) of the Brazilian Central Bank. This registry provides comprehensive information on interest rates, loan amounts, maturities, credit risks, among other variables. Banks must submit monthly reports containing information about each loan. It is important to note that the reporting threshold has changed over time. From January 2003 to December 2011, the threshold stood at 5,000 Brazilian Reais (BRL). Subsequently, between

January 2011 and May 2016, it decreased to 1,000 BRL; starting in June 2016, it was further reduced to 200 BRL.

ESTBAN. Another valuable source of banking information is the Monthly Bank Statistics by municipality, referred to as Estatística Bancária Mensal por município (ESTBAN). This data set provides a comprehensive view of the financial landscape, including the balance sheet of each banking conglomerate, the number of branches in each municipality, and detailed information about loans associated with individual branches. Using the balance sheet data, we extract the credit volume outstanding to households and firms for each bank within a municipality (referred to as the credit stock). This data lets us compute each market's market shares and concentration measures.

It is important to note that ESTBAN and SCR contain information on different sets of loans considering different definitions for location (bank versus consumer location, respectively). Also, ESTBAN and SCR use distinct measures of lending (flows or new loans versus stocks of loans, respectively).

IBGE. We also use information from The Brazilian Institute of Geography and Statistics (IBGE), related to municipality-level characteristics, such as: population, GDP, GDP per capita, among other socio-economic variables.
SGS. We use some publicly available data collected from SGS (Time Series Management Series) of the Brazilian Central Bank.

2.2 Banking Markets

Our analysis spans from January 2012 to December 2016 and includes information on approximately 15 million individuals appearing in the SCR, and their recorded transactions. This sample of individuals represents around 12.8% of all borrowers in the SCR during the period of analysis, and this sample is similar to the one used by Garber et al. (2019). This data set encompasses all credit relationships of individuals with a total financial exposure exceeding a specified threshold, as previously discussed.

We adopt a municipality as our standard definition for a local banking market, using the same criteria outlined in Coelho et al. (2013), Sanches et al. (2018), and Joaquim and van Doornik (2019)[7]. There are 5,568 unique municipalities

[7]We also use a municipality as our standard definition for a local banking market since it is

in our sample. In 2013, most cities exhibited a single bank branch (22.2%) or no branch at all (34.1%).[8] [9] Among cities with a single branch, 66% of these branches were publicly owned. In addition, less than 1% lacked a public bank presence in municipalities with multiple branches, corresponding to 28 municipalities. Regarding branch distribution, approximately half of the municipalities housed two to three different bank branches.[10]

2.3 Banking Concentration

Brazil's banking sector displays pronounced concentration. According to the Global Financial Development Database, the combined assets of the five largest banks in Brazil account for approximately 80% of the total assets held by all commercial banks in the country. In contrast, this same proportion is about 50% in the United States.

Figure 1 displays the empirical density of the Herfindahl-Hirschman index (HHI)[11] by municipalities for the years 2012, 2014, and 2016. Between 2012 and 2016, the density of the HHI shifted to the right, suggesting increased concen-

more granular than a micro-region. In 2013, there were 5,572 municipalities compared to 558 micro-region (Figure C7)

[8]Municipalities without a bank branch can still have certain financial services, with some banks providing financial services. According to Relatório de Inclusão Financeira (2015), Central Bank of Brazil, almost all municipalities had at least one banking hub or banking correspondent (such as a bank branch, a financial service point, an ATM, or a correspondent banking arrangement). These financial institutions developed large networks of partnerships with local retailers such as supermarkets, bakeries, drugstores, lottery houses, etc.

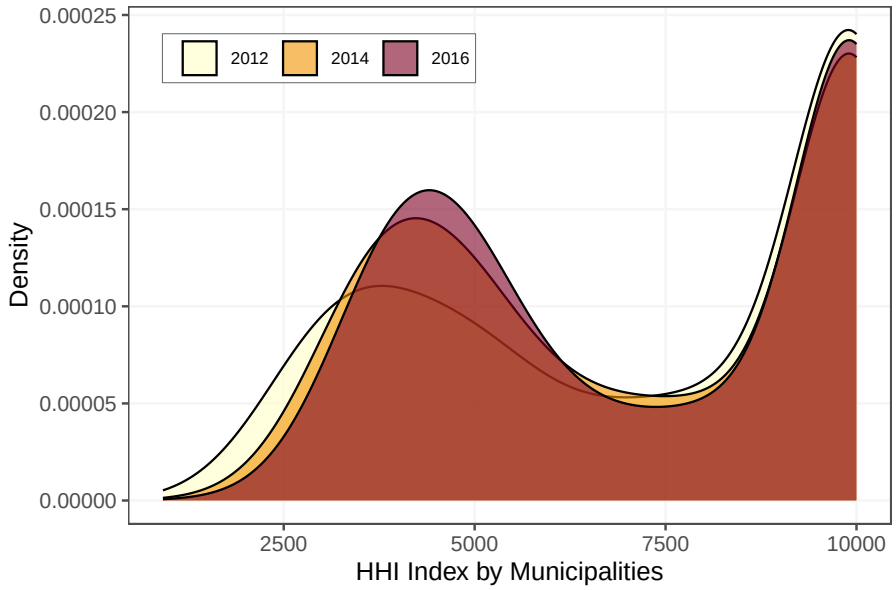
[9]The Central Bank defines a banking correspondent as "a company hired by financial institutions and other institutions authorized by the Central Bank to provide customer service services to customers and users of these institutions." That is a non-banking company (legal entity) responsible for mediating financial institutions and customers. These companies carry out credit operations and other services on behalf of a bank and may have agreements with more than one company. Among the best-known correspondents are lottery outlets and postal banks (Correios). The main objective is to bring banking services to most of the population, extending to places with no branches of the leading banks, for example. This way, it is possible to speed up customer service and facilitate access to credit.

[10]In 2013, the federal government enacted Law 12,685/13, which, among other measures, authorized the establishment of what we know as payment arrangements in Brazil. This regulatory shift marked the inception of what we now refer to as Digital Banks. According to Pesquisa Febraban de Tecnologia Bancária (2018) the percentage of digital accounts was around 16%-22% between 2013 and 2016.

[11]The Herfindahl-Hirschman index (HHI) is a measure of market concentration. It is computed by squaring each bank's market share in every municipality and summing these values. The HHI ranges from 0 to 10,000, with higher values indicating greater market concentration. The maximum value of 10,000 corresponds to the case in which there is only one bank operating in a given municipality.

tration during this period. On average, the HHI index rose from 7,151 in 2012 to 7,253 in 2016.

Figure 1: Density of the HHI Index by Municipality: 2012, 2014 and 2016.



Notes: The figure displays the HHI density by municipality for 2012, 2014, and 2016. Authors' calculation using the data set Estban-BCB.

2.4 Loan Portability

To promote competition in the banking sector, the Brazilian Central Bank (BCB) introduced Resolution No. 4,292 on December 20, 2013, which became effective in May 2014. This resolution established a regulatory framework to facilitate credit portability for consumer loans. It enables borrowers to settle an existing credit arrangement with a financial institution by initiating a new one with a competitor.[12] This new resolution marked a pivotal evolution from the prior attempt in 2006 (Resolution No. 3,402 on September 6, 2006), which had limited effectiveness. The updated rules established transparent and standardized procedures; it also made available and required a BCB-developed electronic platform to exchange credit transaction data between the involved finan-

[12] According to this resolution, the amount and maturity of the loan undergoing portability must not exceed the outstanding balance and the remaining maturity of the credit operation at the original bank.

cial institutions. Additionally, the resolution imposed deadlines and penalties on institutions failing to share credit information promptly. It also ensured that consumers would not be burdened with costs related to credit portability, excluding housing loans.

Credit portability allows individuals to transfer a credit operation to another financial institution under more favorable terms. In practice, after negotiating new terms, a customer could request the credit portability from the original bank to the new institution. This institution then settles the portability process with the original creditor. Although the original bank cannot deny portability, it can match another institution's offer using a right to match, which the client can accept, canceling, in this case, the portability process.

Resolution No. 4,292 allowed credit portability of personal loans, payroll loans (see more on this below), vehicle loans, and mortgages. It does not include overdrafts and revolving credit. It also did not include portability of loans to firms. To request credit portability, the customer must gather information regarding the debt, including the contract number, outstanding balance, due installments, interest rate, and total effective cost. This information must be requested from the original creditor institution, which has up to one business day to provide[13].

With this information, customers approach other institutions for better credit conditions. When they find an attractive offer, they notify the chosen institution, which then initiates the transfer process with the original creditor. The original institution, when contacted, can either (i) propose a counteroffer with better conditions for the client or (ii) approve the portability. If approved, the proposing institution transfers the needed amount to settle the debt, creating a new operation with the original maturity and loan amount. The customer drives the process, which usually takes a few weeks (around a month).

During the period of our analysis from 2012 to 2016, payroll loans accounted for the majority of all requests for loan portability. Table 1 and Figure C6, in the appendix C, show the transferred loans via portability by type of loan between 2014 and 2016. From May 2014, when Resolution No. 4,292 became effective, to December 2016, it becomes evident that payroll loans not only accounted for

[13]More recently, such data can be shared via Open Finance/Banking, provided that both institutions integrate the system, and the customer authorizes the sharing. Open Finance/Banking was created by Joint Resolution No. 1 on May 4, 2020, and is defined as the standardized sharing of data and services through openness and integration of systems.

approximately 99.9% of the credit portability requests submitted; they also constituted a significant fraction (97.9%, on average) of the transferred balance in portability. One possible explanation is that payroll loans, along with auto and real estate financing, frequently require the involvement of a financial intermediary. However, payroll loans offer more flexibility regarding portability since they are not tied to a specific asset. Thus, the portability process is simplified, and the financial intermediaries can earn intermediary commissions.

Table 1: Transferred Loans via Portability by Type of Credit

	R$ million			**Participation (%)**		
Loan type	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Total	2,369.3	5,948.5	7,679.7	100	100	100
Payroll	2,258.4	5,876.6	7,666.8	95.3	98.8	99.8
Personal	0.62	0.30	0.44	0.02	0.005	0.006
Housing (regulated)	30.4	23.1	5.0	1.28	0.39	0.06
Housing	76.3	45.8	4.2	3.21	0.77	0.05
Home equity	2.66	2.21	2.32	0.11	0.03	0.03
Real estate (ex-housing)	0.0	0.0	0.0	0.0	0.0	0.0
Auto	0.97	0.46	0.97	0.04	0.00	0.01
Goods	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0

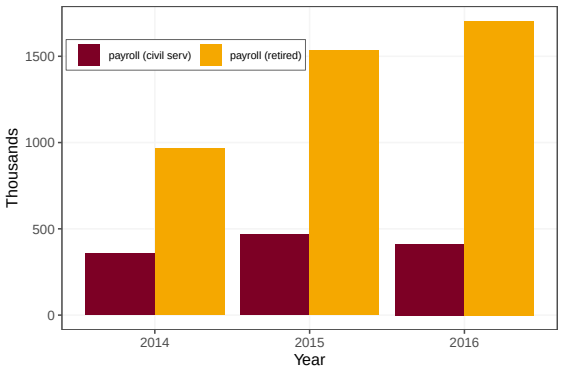
Notes: Stock of transferred loans via portability by type of credit. Values refer to December of each year. Authors' calculation using the data set SGS-BCB.

Figure 2 shows that from 2014 to 2016, approximately 75% of the ported loans originated from retired individuals, while nearly all of the remaining quarter came from civil servants. This distribution closely mirrors the relative proportions of retirees and civil servants in Brazil.[14]

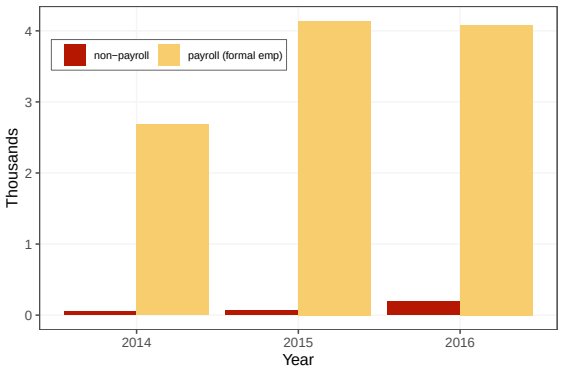
[14] According to Atlas do Estado Brasileiro (IPEA), there were 11.5 million civil servants in Brazil in 2014. In contrast, there were 22.8 million retirees in the country (Pnad, 2014).

Figure 2: Quantity of Loans Transferred via Portability: Payroll vs. Non-payroll

(a) Civil Servants and Retirees (payr)



(b) Formal Emp. (payr.) and Non-Payroll



Notes: The figure displays the decomposition of ported loans into non-payroll personal, payroll (private), payroll (public), and payroll (retired). Authors' calculation using SCR-BCB.

Lastly, there are two critical benefits of credit portability. The first one is when the Central Bank is easing the monetary policy, and agents take advantage of this fact to renegotiate its debt; this is less related to increased competition.[15] Another one is when the interest rate is stable or increasing and, at the same time, loans are being ported; this is the case studied in this paper, and it is related to banking competition and better conditions for borrowers. As pointed out in Figure C5, in Appendix C, Brazil experienced a monetary policy tightening at this time.

2.5 Payroll Loan

Payroll loans are a type of loan in which the principal and interest payments are directly deducted from the borrower's payroll check or social security benefits. In Brazil, they are available to all civil servants, retirees and pensioners. A fraction of formal workers have access to payroll loans. The firm in which formal employees work has to agree with a bank to offer their employees payroll loans. Less than 10% of all formal workers have access to a payroll loan.

[15]For more details: Relatório de Economia Bancária. (2020). Banco Central do Brasil. Retrieved August 31, 2023, from `https://www.bcb.gov.br/content/publicacoes/relatorioeconomiabancaria/reb_2020.pdf`

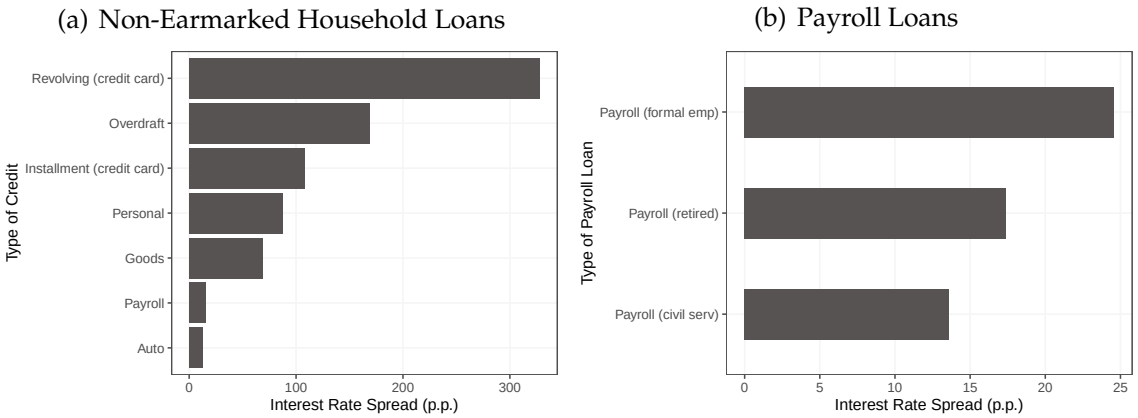
Table 2: Summary Statistics on Payroll Loans

	N	mean	sd	p10	p50	p90
Payroll loan per capita - R$	333992	104.57	51.02	49.15	95.66	171.02
Rate (payroll) - % p.a.	333992	28.46	1.78	26.70	28.41	30.13
Maturity (payroll) - days	333992	1826.94	153.84	1642.39	1812.20	2031.15

Notes: The sample range is January 2012 to December 2016 and includes information on 15 million distinct individuals from the Central Bank of Brazil Credit Registry (SCR) that had a payroll loan.

Payroll loan interest rates are considerably lower than those of other credit types. For payroll loans, the borrower's employment and income status are verified, and the direct deduction of installments minimizes risk for lending institutions. Payments occur directly, reducing delays and default risks. Table 2 provides summary statistics for payroll loans during the time frame of this study. Payroll loans per capita were around R$ 105. Interest rates for payroll loans were around 28.5% per annum, on average. Although not very dispersed (the standard deviation is 1.78), there is some heterogeneity in it, as seen in Figure **??**. Figure 3 shows the average interest rate spreads during 2012-2016 for non-earmarked household loans compared to the BCB target rate (Selic). We observe that payroll loans have the second lowest spread. Figure **??** displays the interest rate spread for payroll loan categories. We observe that payroll loans for private employees are more expensive. Also, interest rates for civil servants are lower, even though the upper-interest ceiling established by Social Security for retirees is lower (more on this below).

Figure 3: Interest Rate Spreads for Non-Earmarked Household Loans



Notes: Average interest rate spreads during 2012-2016 for non-earmarked household loans compared to the BCB target rate (Selic). Panel (a) shows selected non-earmarked types of loans. Panel (b) shows the interest rate spread for payroll loan categories. Authors' calculation using the SGS-BCB database.

However, taking out a payroll loan is only possible if the institution that will lend you money has an agreement with your paying source (government-owned or private companies or the Social Security - INSS, in the case of retirees and pensioners).

For retirees and pensioners, payroll loans offer an additional advantage — an upper-interest rate limit established by the Social Security Agency (INSS). While financial institutions can set payroll loan interest rates freely, they cannot exceed this ceiling. The INSS-sanctioned maximum interest rate was 2.14% p.m. (28.9% p.a.) in 2014 and early 2015 and increased to 2.34% p.m. (32.0% p.a.) in late October 2015. The same happens for federal public servants, where the ceiling for payroll lending rates was 2.50% a.m. (34.5% p.a.) during the study period[16]. State and municipal public servants don't adhere to a unified payroll interest rate; each state or municipality determines employee limits.

These factors elucidate one of the reasons why payroll loans dominate portability requests. Their risk profile is not heavily influenced by the borrower (the main risk being employer bankruptcy), and precise information reduces default risk. As outlined by Dang et al. (2013), securities exhibit key stochastic

[16]The Integrated Personnel Administration System (Siape) centralizes payroll processing for federal civil servants, overseeing the interest rate cap.

moments like mean, variance, and information sensitivity. Due to their unique characteristics, payroll loans excel in these areas, with minimal tail risks.

As observed in Table 3, payroll loans account for around 36% of non-earmarked credit (in terms of volume) during this period, excluding credit cards that do not bear interest rates[17]. A tiny fraction of payroll loans (8.6%) goes to private employees, whereas 30.5% goes to retired individuals and 61% to civil servants.

Hence, this study exclusively concentrated on payroll-deductible credit for two compelling reasons. Firstly, this type of credit is the most predominant category among all portability requests. Secondly, payroll loans are households' primary source of financial resources, comprising a substantial 36 percent of the total volume of non-earmarked loans. Notably, their significance has steadily risen, escalating from 30 percent in 2012 to 41.5 percent in 2016.

Table 3: Composition of Total Volume of Non-Earmarked Credit

	Participation (%)				
Loan type	**2012**	**2013**	**2014**	**2015**	**2016**
Auto	32.2	31.0	28.7	25.4	22.0
Payroll	30.3	33.3	36.4	39.1	41.5
Personal	14.8	15.3	15.7	15.8	15.7
Revolving (Credit Card)	4.4	4.2	4.4	4.8	5.6
Leasing	4.3	1.9	0.8	0.4	0.3
Overdraft	4.1	3.9	4.1	4.0	3.9
Renegotiated	3.6	3.9	3.5	3.7	4.3
Other	2.6	2.9	2.6	3.2	3.4
Goods	1.7	1.7	1.8	1.7	1.5
Installment (Credit Card)	1.6	1.6	1.8	1.8	1.7
Check Cashing	0.3	0.3	0.2	0.2	0.2

Notes: Composition of the total volume of non-earmarked credit excluding credit cards. Authors' calculation using the data set SGS-BCB.

[17]In Brazil, we have three credit card loans: (i) a not bearing interest rate one, (ii) an installment credit card, in which you divide your bill into several payments, and (iii) a revolving credit card that is the case in which you just pay the minimum amount needed of your bill

2.5.1 Loan Intermediary for Payroll Loans

Concerning payroll loans, a pivotal role is played by an intermediary known as the "credit promoter," or as referred to in Portuguese, the *"pastinha"*. This intermediary holds the responsibility of originating payroll loans on behalf of banks. The landscape saw a significant shift with the introduction of Resolution 4,294 by the National Monetary Council (CMN) on December 20, 2013. This resolution addressed certain contentious practices in the realm of payroll loans, with the primary objectives of reducing operating costs for banks and enhancing transparency for borrowers.

In line with the directive, the Central Bank of Brazil ensured that financial institutions allocate a portion of the commission to the *"pastinha"* over the entire duration of the credit contract. Before these changes, the commission could reach as high as 20% of the loan amount, paid immediately upon the loan agreement's execution. Starting in January 2015, the landscape transformed. It was mandated that only a commission of up to 6% of the financing amount could be paid upfront in cash. In instances where the loan was subject to portability, the maximum commission allowed was further reduced to 3% of the financing value. The remaining commission had to be deferred to a later stage.

By paying part of the commission over the duration of the contract, banks hope to inhibit the predatory competition in payroll loans. It has become common practice for a loan to migrate from one bank to another, carried by a *"pastinha"*, a few months after the loan is contracted — with the commission paid in full upon contracting. It is precisely this incentive that banks want to put an end to.

The introduction of credit portability, as outlined in Resolution 4,292 on December 20, 2013, introduced new regulations (as already mentioned in Section 2.4). Starting May 2014, when this resolution took effect, a critical change was instituted: if a debt is transferred from one bank to another, only the interest rate can be modified. The loan's maturity and the remaining balance must remain unaltered. In payroll loans, there was a common practice where, with the assistance of *"pastinha"*, a bank would extend the loan maturity and increase the credit amount offered to the borrower, all to lure them away from the competing bank.

In essence, these resolutions mandate that transfers between banks (loan

portability) can only occur if they result in a reduced interest rate for the end borrower. The competition now revolves around interest rates rather than the practice of "changing" the loan terms.

3 Empirical Analysis

3.1 Framework

Understanding the impact of banking competition on the quantity and cost of credit presents a formidable challenge because this effect is not easily discerned. After all, banking competition is not an independent factor influencing these outcomes. To illustrate this, consider a scenario where public banks experience an imposition by the government to increase their lending. This development would boost credit supply for certain banks and likely influence privately owned banks and interest rates, thereby altering the competitive dynamics within the system.

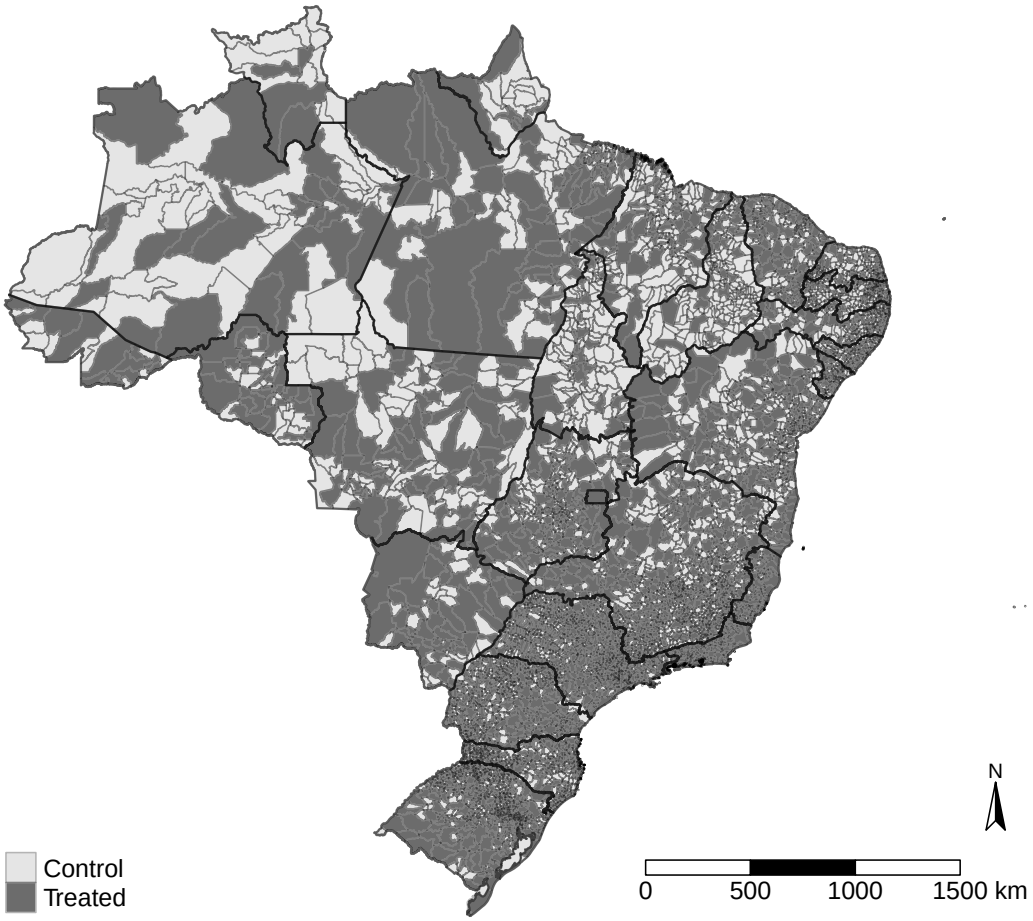
To overcome this identification challenge, we employ Resolution No. 4,292 as a source of exogenous variation in local competition and investigate how this event affected different municipalities. This institutional change provides a quasi-experimental framework for gauging the causal impact of increased bank competition on interest rates and loan volumes across the country.

Our analysis focuses explicitly on payroll loans, given their status as the most prevalent form of credit among portability requests. To isolate the effect of portability on the local credit market, we utilize an empirical differences-in-differences approach, comparing changes in outcomes between markets that were affected by portability and those that were not. In our classification, a municipality is affected by portability (i.e., treated) if it had at least two different bank brands when the resolution was announced in December 2013. This criterion ensured customers could "shop around" for better loan terms, including interest rates. We assume that portability did not impact local bank competition in markets with only one or no banks (control group).

Our difference-in-difference research design closely parallels the methodology employed by Joaquim and van Doornik (2019) to estimate the influence of increased bank competition on these outcomes. It involves comparing outcomes in treated markets (those exposed to the portability episode) with those

in the control group (unexposed) both before and after the implementation of the credit portability resolution. We also control for time-region fixed effects and various characteristics to ensure the robustness of our analysis. Figure 4 visually demonstrates the divergent exposure levels across municipalities in the treated and control groups.

Figure 4: Treated and Control Municipalities in December 2013



Notes: Control municipalities had no bank or one bank in December 2013. Treated municipalities are the municipalities that had at least two banks of different brands in December 2013. Authors' calculation using Estban-BCB.

We focus on data aggregated at the municipality level. Our baseline specification consists of the following difference-in-difference model:

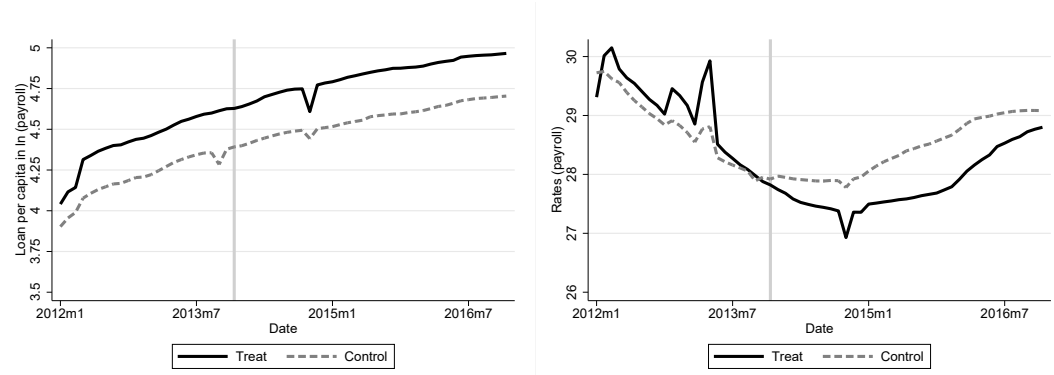
$$y_{m,t} = \gamma_m + \gamma_t + \beta X_{m,t} + \delta TREAT_{m,t} \times POST_t + \varepsilon_{m,t} \quad (1)$$

where $y_{m,t}$ is consumer loans per capita (in ln) or interest rate for municipality m in month/year t; γ_m and γ_t are municipality and time fixed-effects; $X_{m,t}$ is a vector of control variables that is allowed to have a varying effect over time β_t; $TREAT_{m,t}$ is a dummy that is equal to one if a municipality has more than one different bank brands in time t; $TREAT_{m,t} \times POST_t$ is the interaction of the dummy with Loan Portability Resolution.

The cornerstone of our estimates relies on the assumption of parallel trends. The parallel trends assumption states that the treatment and control group before the treatment would have followed the same trend; that is, the difference between the treatment and control group would have remained unchanged over time. Without this regulation, the treatment and control groups would have experienced comparable outcomes over time, conditional on each market's characteristics (Figure 5).

Figure 5: Parallel Trends Assumption

(a) Payroll Loans (per capita, in ln, R$) (b) Interest Rate (% per annum)



Notes: In Panel (a), we present a comparative analysis between the average payroll loans (per capita, in ln) for treated municipalities and the corresponding averages for control municipalities. Panel (b) compares the average interest rate for payroll loans in treated cities against those in the control group. Authors' calculation using SCR-BCB.

Table 4 provides insightful descriptive statistics concerning Brazilian municipalities. Panel A offers an overview of the entire sample. In 2013, the average number of banks per municipality stood at 4.13, with merely 1.98 belonging to

different brands. Notably, in 34% of these municipalities, there were no banks at all. Furthermore, among all Brazilian municipalities, 58% featured a public bank, and when considering all banks within these regions, government-owned banks constituted an average of 39%. Regarding competition, the Herfindahl-Hirschman Index (HHI) averaged 4,714, indicating a high concentration level in the banking sector across the country.

Moving to Panels B and C of Table 4, these segments present similar statistics, specifically for the control and treated groups. In the control group, 60% of municipalities had no banks in 2013. In this group, public banks were present in only 26% of the cities. Conversely, public banks were found in a staggering 99% of the municipalities in the treatment group.

Table 4: Descriptive Statistics

			Panel (a)			
Sample	N	mean	sd	p10	p50	p90
Bank branches (2013)	295104	4.13	41.38	0.00	1.00	5.00
Diff. bank brand (2013)	295104	1.98	2.83	0.00	1.00	5.00
HHI index (2013)	295104	8130.35	2582.91	3765.09	10000.00	10000.00
Public banks (2013)	295104	0.58	0.49	0.00	1.00	1.00
Pct public banks (2013)	295104	0.39	0.38	0.00	0.40	1.00
No bank (Dec 2013)	295104	0.34	0.47	0.00	0.00	1.00
GDP per capita (2011)	294839	14438.91	17816.22	4528.89	10596.64	26716.68
GDP (2011)	294839	786680.51	8216181.40	28104.73	103040.36	902031.60
Urban population (2010)	294839	28927.01	201568.85	1522.00	6263.00	43057.00
			Panel (b)			
Control	N	mean	sd	p10	p50	p90
Bank branches (2013)	166473	0.40	0.49	0.00	0.00	1.00
Diff. bank brand (2013)	166473	0.40	0.49	0.00	0.00	1.00
HHI index (2013)	166473	9999.63	9.87	10000.00	10000.00	10000.00
Public banks (2013)	166473	0.26	0.44	0.00	0.00	1.00
Pct public banks (2013)	166473	0.26	0.44	0.00	0.00	1.00
No bank (Dec 2013)	166473	0.60	0.49	0.00	1.00	1.00
GDP per capita (2011)	166208	11347.52	12110.59	4226.59	7832.41	21020.32
GDP (2011)	166208	72597.00	76508.36	22731.27	52712.45	132308.33
Urban population (2010)	166208	4221.01	3351.39	1112.00	3268.00	8469.00
			Panel (c)			
Treat	N	mean	sd	p10	p50	p90
Bank branches (2013)	128631	8.97	62.34	2.00	4.00	10.00
Diff. bank brand (2013)	128631	4.04	3.25	2.00	4.00	6.00
HHI index (2013)	128631	5711.16	2220.54	3198.40	5108.86	9354.74
Public banks (2013)	128631	0.99	0.11	1.00	1.00	1.00
Pct public banks (2013)	128631	0.55	0.19	0.33	0.50	0.75
GDP per capita (2011)	128631	18433.39	22577.61	5455.62	14038.02	32009.52
GDP (2011)	128631	1709369.37	12377987.73	105551.10	311270.99	2439888.21
Urban population (2010)	128631	60850.37	302171.04	5959.00	17776.00	102025.00

Source: Estban-BCB. **Notes:** Data from 2012-2016. These data sets were computed for each municipality in our sample. "Bank branches (2013)" signifies the average number of branches in the year 2013, while "Diff. bank branches (2013)" represents the average number of distinct branches during the same year. The "HHI index (2013)" corresponds to the Herfindahl-Hirschman Index, a measure of market concentration that varies from 0 to 10,000. "Public banks (2013)" serves as a binary variable, equaling one when a public bank is present in the municipality, and "Pct public banks (2013)" denotes the percentage of public banks within the municipality. Lastly, "No bank (2013)" is another binary variable, equaling one if there are no banks operating within the municipality.

4 The Effects of Loan Portability

This section describes the results for equation 1 using the data described in Section 2.1 and the methodology outlined in Section 3.1.

We show that the loan portability resolution effectively increased local competition by decreasing interest rates and improving credit, consistent with the traditional industrial organization's view of competition. This finding maintains its robustness across various dimensions. We undertook analyses that excluded municipalities with populations exceeding 200 thousand inhabitants, limited the selection to cities housing fewer than five distinct bank brands, and adjusted the treatment start date from December 2013 (the enactment of the loan portability via Resolution No. 4,292) to May 2014 (when the resolution became effective).

Table A1, in appendix A, provides descriptive statistics for the main variables used in our analysis. Notably, interest rates for payroll loans are high, averaging 28.46% annually, whereas the average Central Bank target rate (Selic) stood at 11.23%. The lending spread, computed as the difference between the interest rate for payroll loans and the national target interest rate (Selic), presents an average spread of 17.22 percentage points—an understandable value considering payroll loans' relatively low default risk. The average loan maturity is approximately five years.

Banking markets in Brazil are highly concentrated, but there is a significant geographic variation. Table A1 shows the level of credit concentration measured using data from the bank-municipality balance sheets in Estban. These measures indicate that banking markets in Brazil are very concentrated (HHI $>$ 25000) and heterogeneous in their degree of concentration (given the significant standard deviation). For example, the HHI index averaged 1,104 in the municipality of São Paulo (2012 - 2016), whereas it ranked 5,000 in Brasília, Brazil's fourth most populated city, in 2010.

4.1 Interest Rates

In Table 5, we present the estimates derived from Equation (1) concerning interest rates for all payroll loans spanning from January 2012 to May 2016, averaged across municipalities. The rows within Table 5 denote the dependent vari-

ables, while each column corresponds to a distinct regression model employing different dependent variables. The coefficient δ in Equation (1) is the DiD causal effect we expect to estimate. We include the whole sample in columns (1) and (2). In columns (3) and (4), we run regressions for municipalities with HHI index below or equal to the median for the treated municipalities, that is, HHI below or equal to 5,109. In columns (5) and (6), we run regressions for municipalities with HHI above the median for the treated municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients.

The regressions in Table 5 provide evidence that the loan portability regulation contributed to the reduction of interest rates within the analyzed period. Our empirical results show a reduction of 0.91-0.944 percentage points (p.p.) in interest rates in municipalities with more than one bank in operation (i.e., treated group) compared to those with only one bank or no bank (i.e., control group). Given that the average spread for payroll loans was 18.70 percentage points in this period (see Table A1, Appendix A), this implies that this institutional change alone generated a drop of about 5% in this average spread.

It is interesting to note in Table 5 that our regressions show that the portability regulation was more effective to reduce interest rates in municipalities with lower banking competition, that is, in localities where the HHI index was higher. Thus, we see that the reduction in rates in municipalities with higher HHI index was around 1.022 - 1.039 pp compared to a reduction of 0.8 - 0.845 in localities with a HHI index below or equal to 5,109.

Table 5: Impact of the Loan Portability on the Effective Annual Interest Rate by Municipalities

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.910***	-0.944***	-0.800***	-0.845***	-1.022***	-1.039***
	(0.0284)	(0.0304)	(0.0318)	(0.0348)	(0.0354)	(0.0367)
Constant	28.62***	29.09***	28.48***	29.05***	28.67***	29.04***
	(0.00681)	(0.0851)	(0.00486)	(0.0963)	(0.00543)	(0.0978)
Observations	295,023	295,023	230,469	230,469	230,681	230,681
R-squared	0.498	0.504	0.485	0.490	0.472	0.477
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

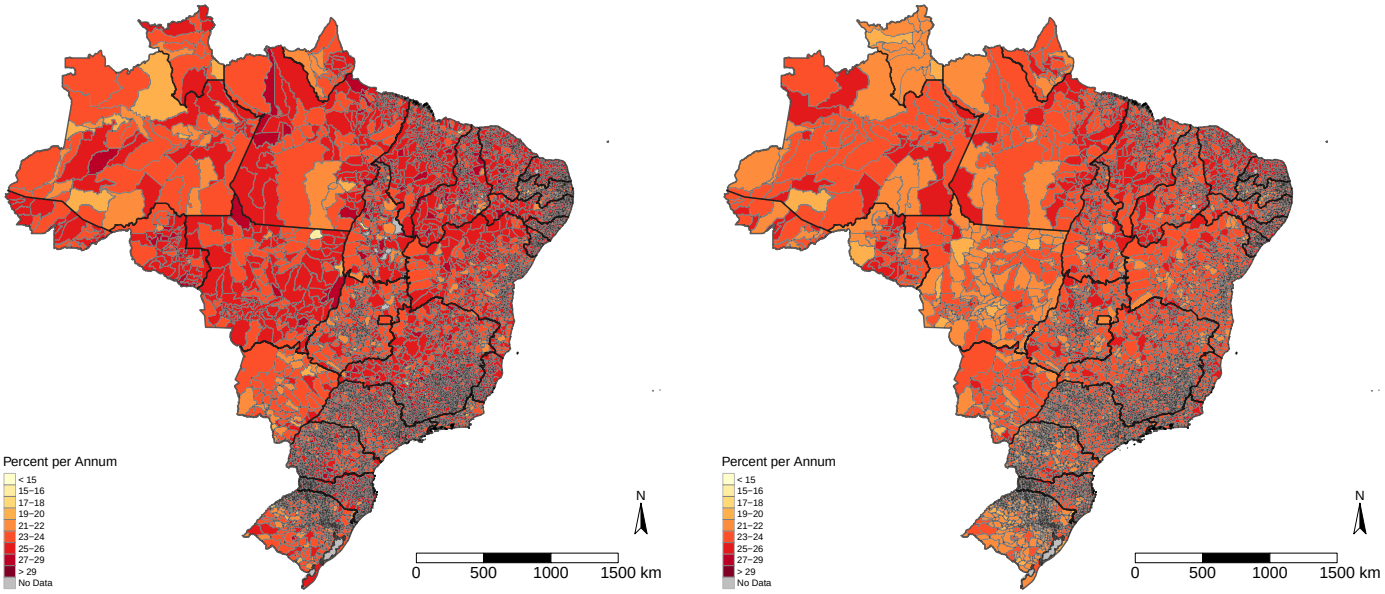
Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Looking into the real data and considering only the payroll loans that were transferred via portability, Figure 6 confirms that the average lending rate for these loans decreased somewhat in most municipalities in the country. It is crucial to emphasize that this period coincided with an upsurge in the Central Bank of Brazil's target rate (Selic), as shown in Figure C5 in Appendix C. Thus, we acknowledge that the prevailing monetary policy stance within the country did not drive this outcome.

Figure 6: Interest Rate of Ported Loans by Municipalities in Brazil: 2014 vs. 2017

(a) 2014

(b) 2017



Notes: Panel (a) displays the average interest rate for payroll loans for each municipality in 2014. Panel (b) displays the average interest rate for payroll loans for each municipality in 2017. Authors' calculation using SCR-BCB.

4.2 Volume of Credit per Capita

Table 6 unveils the outcomes of our estimations based on Equation (1) involving the volume of payroll loans per capita (in ln). Similarly, our data set spans from January 2012 to May 2016, encompassing averages across municipalities. The rows within Table 6 correspond to the dependent variables, whereas each column represents a distinct regression model employing different dependent variables. The coefficient δ featured in Equation (1) stands as the DiD causal effect we aim to estimate.

We include the whole sample in columns (1) and (2). In columns (3) and (4), we run regressions for municipalities with HHI index below or equal to the median for the treated municipalities, that is, HHI below or equal to 5,109. In columns (5) and (6), we run regressions for municipalities with HHI above the median for the treated municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients.

The results from these regressions confirm that implementing the loan portability resolution exerted a positive influence on augmenting the volume of payroll loans in municipalities featuring more than one distinct bank branch, where residents had the option to switch their credit to another bank within the same locality using the portability regulation.

The specifications of the regressions in Table 6 are similar to the ones in Table 5. Columns (1) and (2) in Table 6 reveal that the per capita volume of payroll loans increased by approximately 3.3% to 3.75% during the analyzed period. These numbers are meaningful, especially in the outlook of credit growth at this time, where the stock of payroll loans (in nominal terms) increased by 18.2% year-over-year in 2013, decelerated to 14.2% in 2014, 11.6% in 2015, and 6.7% in 2016. When considering only the municipalities with less competition, with a higher HHI index, the volume of loans per capita was even stronger, as evidenced in columns (5) and (6).

Thus, these results show that loan portability played a pivotal role in enhancing competitiveness within the credit market. This was achieved by fostering an upsurge in the volume of loans within the economy and simultaneously lowering their costs, ultimately benefiting consumers, in line with the classic industrial organization theory.

Table 6: Impact of the Loan Portability on Payroll Loans (per capita) by Municipalities

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.0329***	0.0375***	0.0192***	0.0246***	0.0471***	0.0480***
	(0.00346)	(0.00361)	(0.00371)	(0.00401)	(0.00429)	(0.00436)
Constant	4.489***	4.525***	4.495***	4.525***	4.411***	4.450***
	(0.000828)	(0.0118)	(0.000567)	(0.0139)	(0.000657)	(0.0138)
Observations	295,023	295,023	230,469	230,469	230,681	230,681
R-squared	0.952	0.953	0.951	0.951	0.943	0.943
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

4.3 Extensions

We now provide various extensions to our analysis, showing that the previous results of decreased lending rates and increased credit volume are robust in multiple dimensions.

4.3.1 Government-Owned Banks

We aim to investigate whether the observed trend of decreasing lending rates and an uptick in credit supply can be attributed to other concurrent government policies. One potential candidate for consideration is the government's intervention in its government-owned banks during President Dilma's tenure. Specifically, in March 2012, there was an unforeseen and substantial interven-

tion in Brazil's credit market[18][19]. The government, driven by a desire to reduce interest rates and curb high spreads in the banking sector, initiated an intervention to bolster credit accessibility. This initiative focused on two of Brazil's largest commercial banks, Banco do Brasil (BB) and Caixa Econômica Federal (CEF). It was primarily geared towards households and small to medium-sized enterprises, involving the provision of credit at lower interest rates through government-owned banks. It's worth noting, as outlined by Joaquim et al. (2023), that this intervention did not significantly reduce interest rates on loans from government-owned banks. Instead, the primary mechanism was a sudden surge in the credit supply offered by these banks.

The loan portability resolution was enacted in December 2013, over a year after the government intervened in its publicly owned banks. At that time (December 2013), public banks were present in 58% of the municipalities across the country. Focusing on the two key government-owned banks, Banco do Brasil (BB) and Caixa Econômica Federal (CEF), 55% of these cities had a BB branch, while 29% had a CEF branch. Within the control group, which consisted of cities with only one or no banks by December 2013, 26% had a public bank presence. In contrast, in the treatment group encompassing cities with more than one bank of distinct brands, this percentage increased significantly to 99%, with only 28 cities lacking a public bank.

We begin our analysis by considering the case of BB, as it was the government-owned bank with the broadest presence across the country. Panel (a) of Table 7 presents estimates derived from Equation 1 for a specific subset, comprising control municipalities with a single BB branch and treated cities with at least one BB branch in December 2013, alongside another bank from a different brand. Our analysis reveals that there were no significant changes in lending rates attributable to the enactment of the portability regulation (first four columns of Panel (a) in Table 7). We do see a reduction in interest rates in municipalities that had a higher HHI index, columns (5) and (6), but the magnitude is really small (around -0.16 pp).

[18]BB reduz juros e amplia crédito para empresa e pessoa física. (2012, April 4). Economia. https://g1.globo.com/economia/noticia/2012/04/bb-reduz-juros-e-amplia-credito-para-empresas-e-pessoa-fisica.html

[19]Caixa reduz juros do crédito para famílias e pequenas empresas. (2012, April 9). Seu Dinheiro. https://g1.globo.com/economia/seu-dinheiro/noticia/2012/04/caixa-rediz-juros-do-credito-para-familias-e-pequenas-empresas.html

Analyzing all public banks in the country, Panel (b) of Table 7 uncovers precisely the same pattern. We do see a reduction in rates in columns (1)-(2), (5)-(6), but the magnitude is small. Consequently, we can conclude that implementing the portability resolution effectively contributed to a reduction in interest rates for the most affected loan category, i.e., payroll loans. The actions of public banks did not drive this reduction in lending rates.

Regarding the supply of credit, we do observe an increase during this period in some specifications of Equation 1 in Table B4, in Appendix B, both in Panel (a) and Panel (b). However, we must recognize that we are using credit volume per capita data from the Brazilian Central Bank's credit registry (SCR), which reflects the credit stock. Given the average five-year maturity period for payroll loans, the surge in credit supply per capita (in ln) presented in Table B4 might still be influenced by the aforementioned government intervention.

Table 7: Government-Owned Banks and Loan Portability

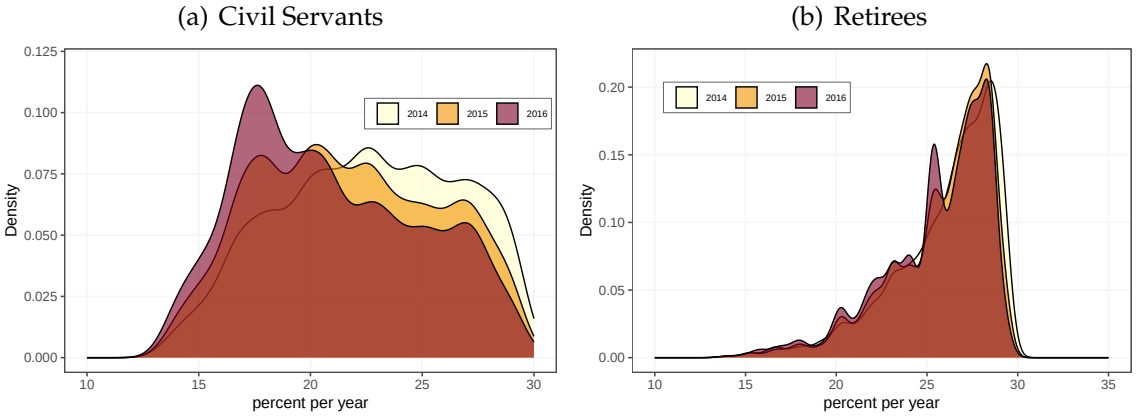
	Panel (a): Banco do Brasil					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.0508	-0.0636	0.0731	0.0768	-0.160***	-0.158***
	(0.0441)	(0.0454)	(0.0464)	(0.0480)	(0.0493)	(0.0507)
Constant	28.36***	28.88***	28.17***	28.85***	28.63***	28.96***
	(0.0187)	(0.107)	(0.0160)	(0.126)	(0.0170)	(0.139)
Observations	161,438	161,438	98,898	98,898	99,110	99,110
R-squared	0.530	0.542	0.508	0.519	0.485	0.497
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Government-Owned Bank					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.0817*	-0.0936**	0.0382	0.0313	-0.189***	-0.189***
	(0.0445)	(0.0452)	(0.0470)	(0.0481)	(0.0494)	(0.0502)
Constant	28.36***	28.96***	28.17***	28.99***	28.59***	29.06***
	(0.0182)	(0.105)	(0.0153)	(0.122)	(0.0161)	(0.133)
Observations	170,978	170,978	107,166	107,166	107,378	107,378
R-squared	0.531	0.544	0.512	0.523	0.492	0.505
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. In Panel (a), we include all municipalities with one Banco do Brasil branch in the control group and at least one Banco do Brasil branch in the treated group. In Panel (b), we include all cities with one government-owned branch in the control group and at least one government-owned bank in the treatment group.

4.3.2 Occupation

As previously noted, payroll loans cater to a select population segment encompassing formal sector employees, civil servants, retirees, and pensioners. This type of loan constitutes over one-third of the non-earmarked credit market, excluding credit cards, with only a minor allocation to private employees (8.6%). Notably, the lion's share of payroll loans (in terms of volume) is held by civil servants (61%) and retirees (30.5%). Thus, this section focuses on answering the question of whether loan portability had a heterogeneous effect on civil servants, retirees, and formal employees.

Figure 7: Distribution of the Interest Rate for Ported Loans: Civil Servants vs. Retirees



Notes: Panel (a) displays the distribution of the interest rate of ported payroll loans for civil servants. Panel (b) displays the distribution of the interest rate of ported payroll loans for retirees. Authors' calculation using SCR-BCB.

Figure 7 offers a visual insight into the distribution of lending rates for payroll loans that were transferred via portability from 2014 to 2016, distinguishing between civil servants (panel (a)) and retirees (panel (b)). This visualization underscores a significant disparity in the outcomes experienced by these groups. In particular, payroll loans held by retirees exhibited a small reduction in interest rates over this period, with several borrowers opting to switch banks for a negligible reduction in loan interest, as depicted in panel (b) of Figure 7. Conversely, the reduction in interest rates for payroll loans held by civil servants was more pronounced and conspicuous, as evident in panel (a) of the same

figure.

Through the estimation of Equation 1 for both sub-samples (retirees and civil servants), we can quantitatively assess the heterogeneity of the regulation's impact on these distinct groups. Due to data availability, we are using a random sample of 748,215 individuals that held payroll loans from January 2013 to May 2016. This sample is aggregated by municipalities, mirroring the methodology applied in Table 5 and Table 6. Furthermore, the estimation of Equation 1 for this random sample is presented in Table B2, Appendix B.

Table 8: Retirees and Loan Portability

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-1.385***	-1.181***	-1.912***	-1.679***	-0.858***	-0.723***
	(0.194)	(0.209)	(0.214)	(0.235)	(0.244)	(0.258)
Constant	29.26***	28.88***	29.20***	28.78***	29.01***	28.64***
	(0.0627)	(0.267)	(0.0445)	(0.303)	(0.0507)	(0.301)
Observations	225,117	225,117	175,214	175,214	175,343	175,343
R-squared	0.091	0.097	0.089	0.094	0.080	0.083
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. The sample range is from January 2012 to May 2016. This is a sample of 748,215 individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals who have a flag indicating they are retired, men who are older than 65 years old, and women who are older than 60 years old.

The regression results outlined in Table 8 provide compelling evidence that the loan portability regulation indeed contributed to the reduction of interest rates for retirees, albeit to a lesser extent compared to the reduction observed for the entire sample (see Table B2 in Appendix B). This result is probably influenced by the *"pastinhas"* – these intermediaries had an incentive to port the

loan to receive a fee until January 2015 (for more details, see 2.5.1). In contrast, comparing these findings with those detailed in Table 9, it becomes evident that civil servants were the category to derive the most significant benefits from the portability regulation. Our estimations indicate that the heightened banking competition effectively lowered interest rates on payroll loans for civil servants by approximately 2.5 to 6.2 percentage points — three times the reduction observed in payroll lending rates for retirees (approximately -0.723 to -1.9 percentage points).

Table 9: Civil Servants and Loan Portability - I

	Panel (a): Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-3.914***	-4.569***	-5.322***	-6.234***	-2.511***	-2.790***
	(0.413)	(0.443)	(0.536)	(0.584)	(0.542)	(0.556)
Constant	28.57***	28.95***	28.38***	28.25***	28.06***	27.92***
	(0.143)	(0.626)	(0.122)	(0.701)	(0.123)	(0.672)
Observations	208,168	208,168	158,658	158,658	158,827	158,827
R-squared	0.107	0.116	0.117	0.123	0.110	0.118
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Federal Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-3.411***	-4.204***	-4.537***	-5.492***	-2.289***	-2.741***
	(0.648)	(0.743)	(0.778)	(0.944)	(0.757)	(0.829)
Constant	27.79***	28.99***	27.86***	29.20***	27.03***	26.73***
	(0.350)	(1.118)	(0.339)	(1.477)	(0.324)	(1.226)
Observations	83,988	83,988	52,457	52,457	52,475	52,475
R-squared	0.108	0.111	0.109	0.110	0.109	0.115
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. This is a sample of 748215 different individuals who had a payroll loan during this period from SCR. From this sample, we selected individuals with a flag indicating they were civil employees (Panel A) or federal civil servants (Panel B). We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table 10: Civil Servants and Loan Portability - II

	Panel (a): State Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-2.293***	-3.053***	-3.205***	-4.240***	-1.381**	-1.777***
	(0.454)	(0.518)	(0.573)	(0.673)	(0.564)	(0.609)
Constant	26.96***	28.76***	26.96***	28.42***	26.48***	27.77***
	(0.202)	(0.804)	(0.185)	(0.882)	(0.180)	(0.892)
Observations	137,780	137,780	95,422	95,422	95,503	95,503
R-squared	0.103	0.109	0.106	0.110	0.110	0.115
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Municipal Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-2.196***	-2.581***	-3.425***	-4.151***	-0.976***	-1.090***
	(0.324)	(0.339)	(0.490)	(0.555)	(0.347)	(0.332)
Constant	28.24***	28.20***	28.25***	28.57***	28.15***	27.65***
	(0.117)	(0.638)	(0.118)	(0.802)	(0.0830)	(0.682)
Observations	193,550	193,550	145,429	145,429	145,547	145,547
R-squared	0.138	0.143	0.143	0.148	0.193	0.198
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

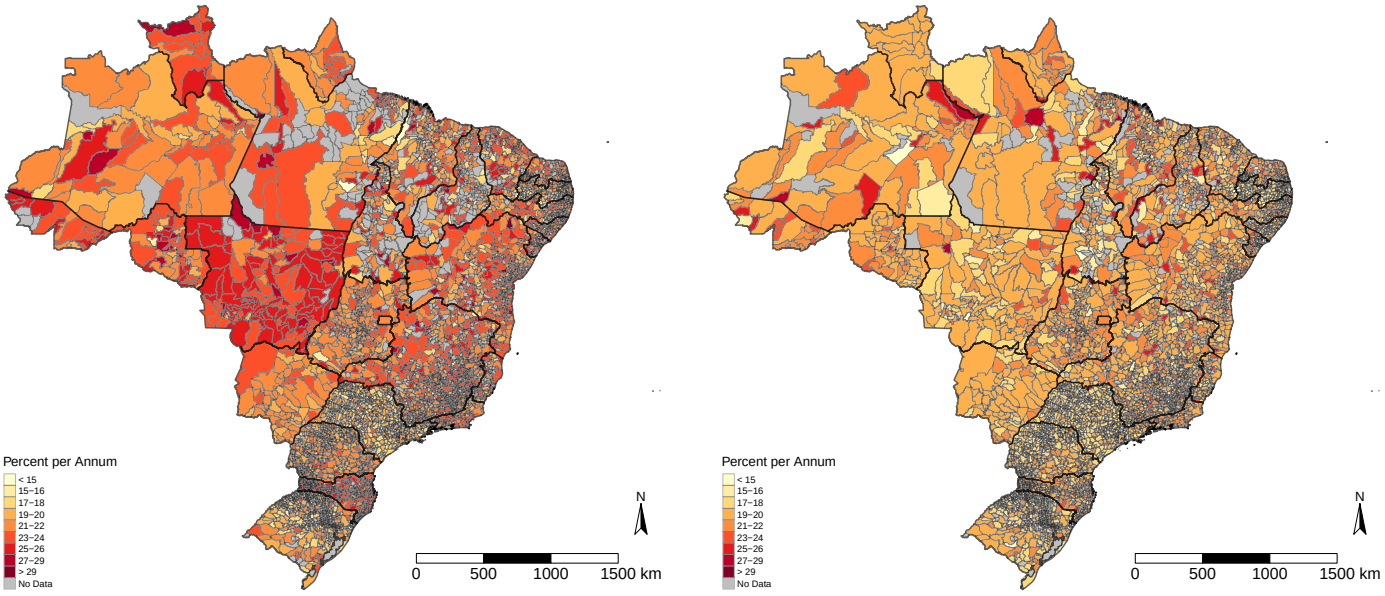
Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. This is a sample of 748215 different individuals who had a payroll loan during this period from SCR. From this sample, we selected individuals with a flag indicating they were state civil employees (Panel A) or municipal civil servants (Panel B). We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Hence, civil servants exhibit greater resilience against income fluctuations, and in the event of adversity, they encounter more favorable interest rates for payroll loans, as delineated in Panel (b) of Figure 3 (see Cavalcanti and Santos

(2020) for further details on the benefits of being a civil servant in Brasil). Our results further indicate that public employees derived greater advantages from the heightened competition within the banking sector resulting from the portability regulation than other population segments. Figure 8 visually portrays the discernible decrease in interest rates for ported payroll loans extended to civil servants, spanning most municipalities nationwide.

Figure 8: Interest Rate of Ported Loans by Municipalities in Brazil for Civil Servants: 2014 vs. 2017

(a) 2014 (b) 2017



Notes: Panel (a) displays the average interest rate for payroll loans for each municipality in 2014 for civil servants. Panel (b) displays the average interest rate for payroll loans for each municipality in 2017 for civil servants. Authors' calculation using SCR-BCB.

Lastly, as already mentioned, around 8.6% of all payroll loans (in terms of volume) were made by formal employees during 2012-2016. This low percentage probably reflects the fact that the employer has to have an agreement with the bank to allow its employees to borrow this type of loan. From the bank's perspective, this is a riskier loan than retirees and civil servant loans due to the possibility of employees being fired and the doubt about who would be responsible for the loan. This fact is reflected in its higher interest rate, as shown

in Panel (b) of Figure 3.

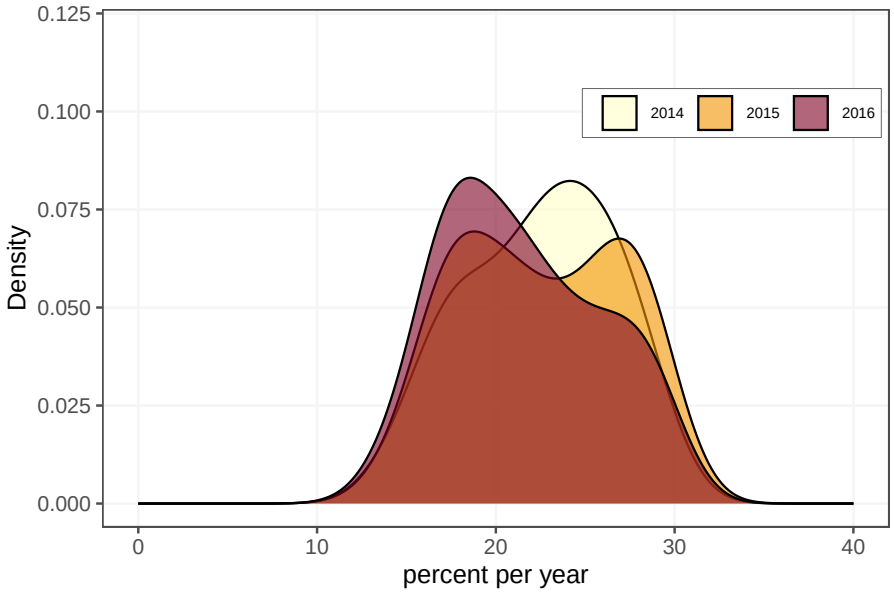
Figure 9 offers a visual insight into the distribution of lending rates for payroll loans transferred via portability from 2014 to 2016 for formal employees. We observe that interest rates for ported loans moved to the left over the years, especially in 2016. This movement was not as pronounced as observed by civil servants thought. Table 11 shows the estimation of the Equation 1 for formal employees. We also use a sample of 748,215 individuals who held payroll loans from January 2013 to May 2016. This sample is aggregated by municipalities, mirroring the methodology used so far. The regression results outlined in Table 11 provide evidence that the loan portability effectively reduced interest rates for treated municipalities and increased the volume of loans per capita. However, the decrease in rates for payroll loans for formal employees was much less pronounced than the one observed for civil servants in Table 9 and Table 10.

Table 11: Formal Employees and Loan Portability

	Formal Employees					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-1.400***	-1.418***	-1.981***	-2.095***	-0.824*	-0.779*
	(0.378)	(0.385)	(0.454)	(0.476)	(0.455)	(0.463)
Constant	31.50***	28.72***	31.42***	29.92***	31.14***	25.98***
	(0.168)	(1.766)	(0.151)	(2.217)	(0.144)	(2.381)
Observations	139,406	139,406	95,478	95,478	95,552	95,552
R-squared	0.221	0.221	0.244	0.245	0.267	0.268
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. This is a sample of 748215 individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals who have a flag indicating they are formal employees. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Figure 9: Distribution of the Interest Rate for Ported Loans for Formal Employees



Notes: The figure displays the distribution of the interest rate of ported payroll loans for formal employees. Authors' calculation using SCR database.

4.3.3 Income

According to data extracted from the 2021 Financial Citizenship Report, published by the Central Bank of Brazil[20], more recently there was an increase in the proportion of the adult population with access to credit, to 49%. However, a more granular examination of credit accessibility and utilization, as assessed through the lens of income distribution, reveals a stark contrast.

Considering individuals from SCR who had income information, 53.7 million people earned up to R$ 1,500, 43 million people earned between R$ 1,500 and R$ 5,200 and 10,8 million people had an income above R$ 5,200 (among this group, the richest 1%, or 1.1 million people, earned more than R$ 21,000). Thus, half of the lowest-income borrowers represent 11.6% of the reported income mass in SCR, i.e., individual income multiplied by the frequency; while the highest-income group (the richest 1% or 1.1 million people) represents 47.3%.[21].

[20]Relatório de Cidadania Financeira. (2021). Banco Central do Brasil. Retrieved August 31, 2023, from `https://www.bcb.gov.br/content/cidadaniafinanceira/documentos_cidadania/RIF/Relatorio_de_Cidadania_Financeira_2021.pdf`

[21]Relatório de Cidadania Financeira. (2021). Banco Central do Brasil. Retrieved Au-

To assess the impact of the loan portability regulation within these huge socioeconomic disparities, we run Equation 1 considering individual income levels. We constructed three sub-samples: (i) low income, encompassing individuals earning up to 2 minimum wages (Panel (a) of Table 12); (ii) middle income, for those earning between 2 to 5 minimum wages (Panel (b) of Table 12); (iii) high income, comprising those earning more than five minimum wages (Panel (c) of Table 12). Due to data availability, we are using a random sample of 748,215 individuals that held payroll loans from January 2013 to May 2016. This sample is aggregated by municipalities, mirroring the methodology applied in Table 5 and Table 6. Furthermore, the estimation of Equation 1 for this whole random sample is presented in Table B2 in Appendix B.

The findings reveal that middle and high-income individuals were the primary beneficiaries of the portability regulation. For these cohorts, interest rates on payroll loans witnessed a reduction of approximately 1.2 to 4.8 percentage points depending on the specification, in stark contrast to the 1.0 to 1.6 percentage point decrease observed among low-income individuals.

Thus, recent papers have focused their attention on heterogeneity in returns to financial and physical capital (see Benhabib et al. (2011); Benhabib and Bisin (2018); Gabaix et al. (2016)) and the heterogeneity within asset classes and its positive correlation to wealth (Fagereng et al. (2020) and the other chapters of this thesis, Chapter **??** and Chapter **??**). Our findings complement this body of work by revealing significant disparities in interest rates within borrowing categories. These disparities are likely exacerbating the vast income inequality prevalent in the country.

gust 31, 2023, from `https://www.bcb.gov.br/content/cidadaniafinanceira/documentos_cidadania/RIF/Relatorio_de_Cidadania_Financeira_2021.pdf`

Table 12: Income and Loan Portability

	Panel (a): Low Income					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-1.346***	-1.346***	-1.682***	-1.682***	-1.013***	-1.013***
	(0.203)	(0.203)	(0.215)	(0.215)	(0.271)	(0.271)
Constant	29.58***	29.58***	29.45***	29.45***	29.32***	29.32***
	(0.0650)	(0.0650)	(0.0440)	(0.0440)	(0.0554)	(0.0554)
Observations	227,668	227,668	177,730	177,730	177,894	177,894
R-squared	0.118	0.118	0.116	0.116	0.099	0.099
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Middle Income					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-2.791***	-2.928***	-3.790***	-3.955***	-1.789***	-1.875***
	(0.211)	(0.219)	(0.265)	(0.274)	(0.280)	(0.280)
Constant	29.16***	29.10***	29.04***	28.85***	28.67***	28.30***
	(0.0693)	(0.671)	(0.0563)	(0.826)	(0.0593)	(0.794)
Observations	221,734	221,734	171,800	171,800	171,960	171,960
R-squared	0.135	0.137	0.159	0.161	0.154	0.156
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): High Income					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-2.809***	-3.077***	-4.365***	-4.822***	-1.270***	-1.408***
	(0.241)	(0.253)	(0.369)	(0.402)	(0.261)	(0.265)
Constant	27.79***	28.89***	27.92***	28.50***	27.14***	28.41***
	(0.0926)	(0.599)	(0.0972)	(0.742)	(0.0680)	(0.669)
Observations	184,483	184,483	135,517	135,517	135,703	135,703
R-squared	0.139	0.140	0.147	0.149	0.218	0.220
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. This is a sample of 748215 individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals that have a flag indicating they had income up to 2 minimum wages (panel (a), low income), income between 2 to 5 minimum wages (panel (b), middle income), or income above five minimum wages (panel (c), high income). We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

4.4 Robustness

Since a municipality must have at least two different brand branches to be exposed to portability, according to our identification strategy, treatment municipalities are generally larger and richer than control municipalities.

In this direction, our findings demonstrate remarkable resilience across various specifications and subgroups. For instance: (i) We conduct an additional analysis where we exclude municipalities that have populations exceeding 200,000 inhabitants (outlined in Panel (a) of Table 13); (ii) We narrow our focus to encompass exclusively those municipalities harboring fewer than five bank branches in total as of December 2013 (as showcased in Panel (b) of Table 13), encompassing approximately 85% of the total municipal count.

In both scenarios, our results consistently affirm the robustness of our conclusions, reaffirming the positive impact of the loan portability regulation on competition through a reduction in lending rates and an increase in credit volumes, irrespective of the municipality's size or banking branch density.

Table 13: Smaller Cities and Loan Portability

	Panel (a): Municipalities with less than 200,000 inhabitants					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-0.924***	-0.957***	-0.826***	-0.873***	-1.023***	-1.040***
	(0.0289)	(0.0309)	(0.0339)	(0.0370)	(0.0350)	(0.0365)
Constant	28.62***	29.10***	28.49***	29.04***	28.67***	29.04***
	(0.00670)	(0.0866)	(0.00497)	(0.0978)	(0.00515)	(0.0988)
Observations	287,815	287,815	226,865	226,865	227,077	227,077
R-squared	0.496	0.501	0.476	0.481	0.477	0.483
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Municipalities with up to four different bank brands					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-1.008***	-1.029***	-0.991***	-1.017***	-1.027***	-1.042***
	(0.0322)	(0.0335)	(0.0416)	(0.0427)	(0.0382)	(0.0400)
Constant	28.66***	29.10***	28.55***	29.08***	28.64***	28.99***
	(0.00607)	(0.0910)	(0.00474)	(0.0995)	(0.00435)	(0.104)
Observations	253,206	253,206	209,534	209,534	209,799	209,799
R-squared	0.485	0.491	0.465	0.471	0.474	0.479
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): One bank (control) x Two banks (treatment)					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-0.255***	-0.254***	-0.255***	-0.272***	-0.248***	-0.232***
	(0.0510)	(0.0514)	(0.0686)	(0.0709)	(0.0589)	(0.0600)
Constant	28.61***	29.04***	28.54***	29.03***	28.62***	28.99***
	(0.00991)	(0.150)	(0.00814)	(0.168)	(0.00691)	(0.164)
Observations	101,389	101,389	83,316	83,316	83,581	83,581
R-squared	0.476	0.485	0.455	0.464	0.486	0.493
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. In Panel (a), we include all municipalities that had less than 200 thousand inhabitants in December 2013. In Panel (b), we include all cities that had up to 4 different bank brands in December 2013. In Panel (c), we include municipalities that have one bank in the control group and two different banks in the treatment group.

We chose December 2013 as the treatment date, aligning with a common assumption in the Difference-in-Difference framework, which assumes a lack of anticipation. While the portability regulation was officially announced in December 2013, its practical implementation occurred in May 2014.

In light of this, we conducted a supplementary analysis, revisiting our assumptions by considering May 2014 as the effective treatment date. The outcomes of this revised analysis, as delineated in Table 14, closely parallel those obtained using our initial December 2013 treatment date.

Table 14: Changing the Treatment Date and Loan Portability

	Treatment date: May 2014					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.877***	-0.920***	-0.768***	-0.824***	-0.987***	-1.011***
	(0.0266)	(0.0283)	(0.0299)	(0.0327)	(0.0326)	(0.0337)
Constant	28.58***	29.07***	28.46***	29.03***	28.64***	29.03***
	(0.00548)	(0.0849)	(0.00394)	(0.0961)	(0.00428)	(0.0977)
Observations	295,023	295,023	230,469	230,469	230,681	230,681
R-squared	0.497	0.503	0.485	0.490	0.471	0.477
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. We include all municipalities and change the treatment date to May 2014; we say that a municipality is treated in case it had at least two different bank branches in May 2014. We also say it is a control city otherwise. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Another concern about our identification strategy could be the inclusion of municipalities that do not have a bank branch in the control group. According to the 2015 Financial Inclusion Report, published by the Central Bank of Brasil[22], in 2014, almost all municipalities had at least one banking hub (such as

[22]Relatório de Inclusão Financeira. (2015). Banco Central do Brasil. Retrieved Oc-

a bank branch, a financial service point, an ATM, or a correspondent banking arrangement). Financial institutions in the country developed a large network of partnerships with local retailers, such as supermarkets, bakeries, drugstores, lottery houses, etc, to offer banking services to the population.

We chose a more conservative approach and excluded from the control group the municipalities that did not have financial services (such as bank branches, financial service points, or correspondent banking arrangements). We also excluded from the control group the municipalities that had an ATM or banking hub inside a private company (called PAB) since this may not be available for the entire people of this city. The result is that we excluded 95 cities from the control group. Table 15 shows the estimates derived from Equation 1. We observe that the results are very similar to the ones in Table 5 and Table 6. Thus, our baseline specification is robust to excluding municipalities that do not have financial services.

tober 13, 2023, from https://www.bcb.gov.br/content/cidadaniafinanceira/documentos_cidadania/RIF/RIF2015.pdf

Table 15: Excluding Cities Without Financial Services and Loan Portability

	Excluding municipalities without financial service point					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.883***	-0.912***	-0.773***	-0.809***	-0.995***	-1.007***
	(0.0286)	(0.0309)	(0.0319)	(0.0355)	(0.0355)	(0.0372)
Constant	28.63***	29.06***	28.49***	29.01***	28.69***	29.00***
	(0.00697)	(0.0859)	(0.00499)	(0.0974)	(0.00557)	(0.0988)
Observations	289,988	289,988	225,434	225,434	225,646	225,646
R-squared	0.501	0.507	0.488	0.493	0.473	0.479
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We excluded 95 municipalities that did not have a banking hub (such as bank branches, financial service points, or correspondent banking arrangements) in December 2013. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

We conducted a series of placebo regressions to substantiate the causal relationship underpinning the results in Tables 5 and 6. In these placebo treatment tests, we essentially replicated the primary analysis outlined in Equation 1, albeit with a distinct treatment variable. Instead of considering the treatment occurred in December 2013, we pushed it back to May 2013. This approach was adopted to discern any associations that should be non-existent if our research design is robust. The outcomes of these placebo regressions, as detailed in Table 16, indicate the absence of statistically significant reductions in payroll lending rates for the regressions in Panel (a) or expansions in payroll supply during this earlier period (Panel (b)).

Table 16: Placebo Regressions - I

	Placebo - Treatment date: May 2013					
	Panel (a): interest rates for payroll loans					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.0221	0.00853	-0.00186	0.0487	-0.0483	-0.0347
	(0.0409)	(0.0404)	(0.0441)	(0.0439)	(0.0477)	(0.0472)
Constant	29.10***	28.42***	28.96***	28.42***	29.31***	28.40***
	(0.00899)	(0.119)	(0.00733)	(0.154)	(0.00781)	(0.148)
Observations	87,713	87,713	58,481	58,481	58,577	58,577
R-squared	0.447	0.459	0.441	0.451	0.420	0.432
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): payroll loans per capita (in ln)					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-0.0127***	-0.0116***	-0.0235***	-0.0229***	-0.00168	-0.00114
	(0.00376)	(0.00379)	(0.00389)	(0.00401)	(0.00432)	(0.00432)
Constant	4.372***	4.367***	4.413***	4.416***	4.259***	4.262***
	(0.000828)	(0.0122)	(0.000646)	(0.0151)	(0.000708)	(0.0154)
Observations	87,713	87,713	58,481	58,481	58,577	58,577
R-squared	0.970	0.970	0.970	0.971	0.961	0.961
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors are in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on the (Panel (a)) effective annual interest rate by municipalities and (Panel (b)) the volume of payroll loans per capita (ln). The sample range is January 2012 to December 2013. We include all municipalities and change the treatment date to May 2013; we say that a municipality is treated in case it had at least two different bank branches in May 2013. We also say it is a control city otherwise. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

As described in Section 2, portability does not include overdrafts and re-

volving credit. Thus, some institutions suggest expanding it to overdraft loans[23], revolving credit cards and credit card balances.[24]. Table 1 shows the transferred loans via portability by type between 2014 and 2016 (in R$ million and the participation in percent). As described in section 2, most ported loans were payroll loans (95.3% in 2014, 98.8% in 2015, and 99.8% in 2016). During this period, no overdraft loan was ported, and we would not expect that the portability resolution would affect this loan. In order to access the robustness of our empirical strategy, we ran equation 1 for overdraft loan, and the results are in Table 17.

Table 17: Placebo Regressions - II

	Overdraft Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	15.98***	14.96***	22.59***	20.95***	10.99***	10.72***
	(0.882)	(0.902)	(1.056)	(1.105)	(1.101)	(1.105)
Constant	119.9***	52.56***	117.6***	50.89***	121.2***	73.13***
	(0.231)	(7.553)	(0.183)	(9.477)	(0.185)	(9.898)
Observations	266,207	266,207	203,318	203,318	203,473	203,473
R-squared	0.617	0.621	0.612	0.615	0.576	0.579
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

As shown in Table 17, interest rates for overdraft loans increased in the treated municipalities (cities with more than one different bank brand) com-

[23]Overdrafts portability was regulated by Resolution No. 5,057 on December 15, 2022.

[24]Portabilidade de crédito é pouco conhecida e considerada burocrática pelo consumidor, mostra pesquisa. (2023, April 5). Valor Econômico. https://valor.globo.com/financas/noticia/2023/04/05/portabilidade-de-credito-e-pouco-conhecida-e-considerada-burocratica-pelo-consumidor-mostra-pesquisa.ghtml.

pared to cities with just one or no bank branch. Surprisingly, credit volume per capita also surged. This might appear as an anomaly at first glance. However, this could suggest a strategic move by banks.

With more competition in the least profitable line, payroll loans, banks may have had a strategy of increasing the credit supply in more profitable lines as overdraft loans in municipalities more affected by the portability regulation. Overdraft loans, by nature, serve as an emergency line of credit and are less sensitive to changes in interest rates. Furthermore, they exhibit qualities akin to insurance products meant to be tapped into during unforeseen crises or emergencies.

5 Conclusion

Consumer credit penetration has steadily increased over recent decades, with over $41 trillion in household debt globally, equivalent to around 40% of GDP across countries. In Brazil, banking credit has increased from 30% of GDP in 2007 to 53% in 2022, with household credit accounting for almost 60% of total credit. The banking sector plays a central role in the economy, bridging the gap between creditors and borrowers while also imposing a fee for providing its services, known as the spread. Brazil's inefficient enforcement of collateral rights compared to international standards has contributed to its high banking spread. Additionally, and the focus of this study, the country's market power wielded by banks also plays a pivotal role in driving elevated banking spreads in Brazil.

The Brazilian Central Bank (BCB) implemented Resolution No. 4,292 to foster competition within the banking industry. This change introduced a regulatory framework for consumer credit portability, allowing borrowers to settle existing credit arrangements with one financial institution by initiating a new one with a competing entity. The revised rules brought about more transparency and standardization in procedures, mandating the use of an electronic platform to exchange credit transaction information between the two involved financial institutions. The resolution also imposed strict timelines and penalties for financial institutions failing to provide timely credit information.

An overwhelming majority of ported loans between the effective date of

Resolution No. 4,292 and December 2016 pertained to payroll loans, thus this type of credit was the focus of this study. The study uses an empirical differences-in-differences methodology to assess the causal effects of greater bank competition on the country's interest rates and loan volume. The results show a reduction in interest rates of approximately 0.95 percentage points in municipalities with more than one bank in operation compared to those with only one bank or none at all.

The study provides robust and economically relevant evidence that credit portability exerted a favorable influence by lowering interest rates and enhancing loan volumes for credit types that reaped the most benefits from the regulation. However, these advantages were not evenly distributed among all borrowers; civil servants and higher-income individuals were the primary beneficiaries. The potential of portability could be improved further with (i) the advent of Open Banking, which aims to reduce the informational advantages held by incumbent institutions and streamline the borrower's quest for superior offers; (ii) easier accessibility to portability loan procedures (for more details, see Appendix A.2).

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Appendix

A Data

A.1 Summary Statistics

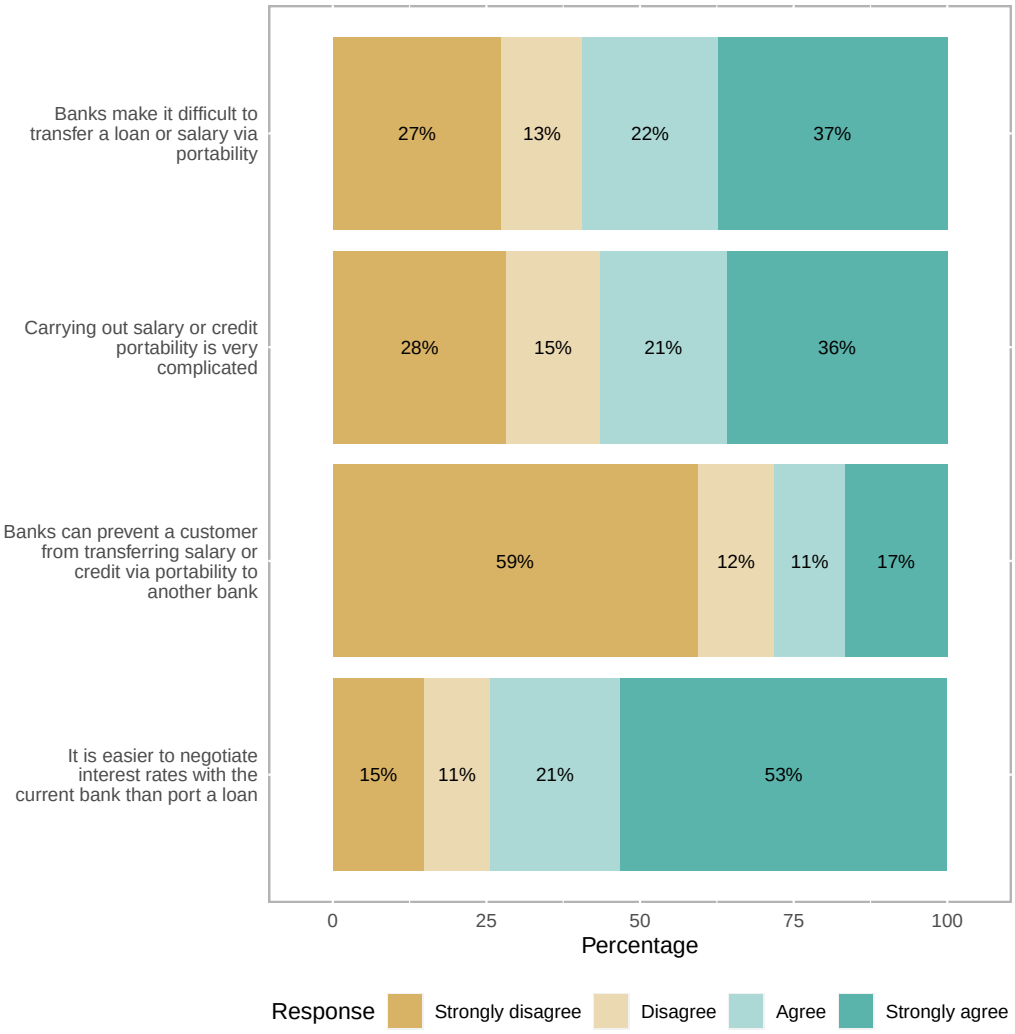
Table A1: Payroll Loans

	N	mean	sd	p10	p50	p90
Payroll loan per capita	295023	100.78	49.11	47.59	92.07	164.45
Rate (payroll)	295023	28.40	1.85	26.61	28.32	30.17
Maturity (payroll)	295023	1805.14	144.76	1633.76	1792.59	1998.92
Selic	295023	11.14	2.45	7.50	11.00	14.25
Lending spread	295023	17.26	3.39	13.51	16.72	21.82
Bank branch	295023	4.05	40.56	0.00	1.00	5.00
Diff. bank brand	295023	1.95	2.76	0.00	1.00	5.00
Public banks (Dec 2013)	295023	0.58	0.49	0.00	1.00	1.00
Public banks (BB and CEF) Dec 2013	295023	0.56	0.50	0.00	1.00	1.00
Pct public banks (BB and CEF) Dec 2013	295023	0.33	0.35	0.00	0.33	1.00
BB branches Dec 2013	295023	0.55	0.50	0.00	1.00	1.00
CEF branches Dec 2013	295023	0.29	0.45	0.00	0.00	1.00
Treat Dec 2013	295023	0.44	0.50	0.00	0.00	1.00
Diff. bank brand (Dec 2013)	295023	1.97	2.75	0.00	1.00	5.00
Bank branches (2013)	295023	4.13	41.38	0.00	1.00	5.00
Diff. bank brand (2013)	295023	1.98	2.83	0.00	1.00	5.00
HHI index (2013)	295023	8129.84	2583.08	3765.09	10000.00	10000.00
Public banks (2013)	295023	0.58	0.49	0.00	1.00	1.00
Pct public banks (2013)	295023	0.39	0.38	0.00	0.40	1.00
No bank (Dec 2013)	295023	0.34	0.47	0.00	0.00	1.00
GDP per capita in 2011	294758	14440.48	17818.24	4528.89	10596.64	26716.68

Notes: Data from January 2012 to May 2016. These data sets were computed for each municipality in our sample. "Bank branches (2013)" is the average number of branches in the year 2013, while "Diff. bank branches (2013)" represents the average number of distinct branches during the same year. The "HHI index (2013)" corresponds to the Herfindahl-Hirschman Index, a measure of market concentration that varies from 0 to 10,000. "Public banks (2013)" serves as a binary variable, equaling one when a public bank is present in the municipality, and "Pct public banks (2013)" denotes the percentage of public banks within the municipality. Lastly, "No bank (2013)" is another binary variable, equaling one if no bank operates within the municipality. Authors' calculation using SCR-BCB and Estban-BCB.

A.2 Datafolha Survey on Portability

Figure A1: Opinion about Portability



Notes: This quantitative research was conducted through 1,621 individual interviews from November 8th to 18th, 2022. For this chart, I selected the questions related to portability from the survey and excluded from the chart the individuals that did not know the answer or that "neither agree nor disagree" . The questions in Portuguese are: (i) Os bancos dificultam o processo para fazer portabilidade de salário ou crédito para outra instituição; (ii) Fazer portabilidade de salário ou crédito é muito complicado; (iii) Os bancos podem impedir o cliente de fazer a portabilidade de salário ou crédito para outra instituição; (iv) É mais fácil negociar taxas de juros com o banco que já está trabalhando do que fazer a portabilidade. Authors' calculation using Panorama da Portabilidade. (2022). Zetta. Retrieved September 23, 2023, from https://somoszetta.org.br/wp-content/uploads/2023/04/Zetta-Panorama-da-Portabilidade-desktop.pdf.

B Tables

B.1 Interest Rates

Table B2: Loan Portability and Interest Rates

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	-1.537***	-1.374***	-1.894***	-1.755***	-1.181***	-1.013***
	(0.189)	(0.197)	(0.204)	(0.219)	(0.248)	(0.254)
Constant	29.32***	28.69***	29.17***	28.67***	29.10***	28.52***
	(0.0602)	(0.292)	(0.0417)	(0.342)	(0.0506)	(0.337)
Observations	228,050	228,050	178,112	178,112	178,276	178,276
R-squared	0.138	0.149	0.134	0.146	0.117	0.126
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. The sample range is from January 2013 to May 2016. This is a sample of 748,215 individuals who had a payroll loan during this period from SCR.

B.2 Volume of Credit per Capita

Table B3: Loan Portability and Loan per Capita

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.366***	0.343***	0.402***	0.381***	0.330***	0.322***
	(0.0207)	(0.0219)	(0.0224)	(0.0248)	(0.0260)	(0.0267)
Constant	1.640***	1.603***	1.673***	1.605***	1.627***	1.562***
	(0.00661)	(0.0357)	(0.00459)	(0.0420)	(0.00530)	(0.0411)
Observations	228,050	228,050	178,112	178,112	178,276	178,276
R-squared	0.803	0.808	0.790	0.795	0.774	0.779
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. The sample range is from January 2013 to May 2016. This is a sample of 748,215 individuals who had a payroll loan during this period from SCR.

Table B4: Government-Owned Banks and Loan Portability - II

	Panel (a): Banco do Brasil					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.0129**	0.0178***	-0.000388	0.00759	0.0271***	0.0283***
	(0.00508)	(0.00518)	(0.00534)	(0.00565)	(0.00564)	(0.00570)
Constant	4.585***	4.605***	4.653***	4.666***	4.459***	4.478***
	(0.00215)	(0.0122)	(0.00184)	(0.0156)	(0.00195)	(0.0155)
Observations	161,438	161,438	98,898	98,898	99,110	99,110
R-squared	0.968	0.969	0.970	0.971	0.958	0.959
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Government-Owned Bank					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0234***	0.0251***	0.00994*	0.0154***	0.0378***	0.0355***
	(0.00485)	(0.00483)	(0.00510)	(0.00518)	(0.00548)	(0.00539)
Constant	4.574***	4.595***	4.637***	4.640***	4.453***	4.474***
	(0.00198)	(0.0126)	(0.00166)	(0.0157)	(0.00179)	(0.0161)
Observations	170,978	170,978	107,166	107,166	107,378	107,378
R-squared	0.966	0.967	0.967	0.968	0.955	0.956
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2012 to May 2016. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. In Panel (a), we include all municipalities with one Banco do Brasil branch in the control group and at least one Banco do Brasil branch in the treated group. In Panel (b), we include all cities with one government-owned branch in the control group and at least one government-owned bank in the treatment group.

Table B5: Retirees and Loan Portability - II

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.453***	0.440***	0.522***	0.514***	0.385***	0.394***
	(0.0199)	(0.0206)	(0.0217)	(0.0235)	(0.0258)	(0.0261)
Constant	0.461***	0.281***	0.505***	0.266***	0.497***	0.279***
	(0.00643)	(0.0485)	(0.00451)	(0.0578)	(0.00534)	(0.0570)
Observations	225,117	225,117	175,214	175,214	175,343	175,343
R-squared	0.703	0.706	0.688	0.691	0.669	0.672
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. The sample range is from January 2013 to May 2016. This is a sample of 748,215 individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals who have a flag indicating they are retired, men who are older than 65 years old, and women who are older than 60 years old.

Table B6: Civil Servants and Loan Portability - III

	Panel (a): Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	1.136***	1.194***	1.648***	1.733***	0.628***	0.661***
	(0.0367)	(0.0368)	(0.0512)	(0.0509)	(0.0421)	(0.0419)
Constant	0.440***	0.377***	0.475***	0.396***	0.691***	0.743***
	(0.0127)	(0.0730)	(0.0116)	(0.0838)	(0.00954)	(0.0820)
Observations	208,168	208,168	158,658	158,658	158,827	158,827
R-squared	0.582	0.585	0.604	0.607	0.608	0.614
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Federal Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.759***	0.804***	1.157***	1.293***	0.364***	0.395***
	(0.0489)	(0.0504)	(0.0609)	(0.0644)	(0.0541)	(0.0546)
Constant	-0.852***	-1.033***	-0.824***	-0.882***	-0.576***	-0.666***
	(0.0264)	(0.164)	(0.0266)	(0.216)	(0.0232)	(0.196)
Observations	83,988	83,988	52,457	52,457	52,475	52,475
R-squared	0.577	0.578	0.606	0.609	0.589	0.591
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2013 to May 2016. This is a sample of 748215 different individuals who had a payroll loan during this period from SCR. From this sample, we selected individuals with a flag indicating they were civil employees (Panel A) or federal civil servants (Panel B). We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table B7: Civil Servants and Loan Portability - IV

	Panel (a): State Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.738***	0.782***	1.102***	1.205***	0.378***	0.399***
	(0.0382)	(0.0391)	(0.0537)	(0.0559)	(0.0412)	(0.0412)
Constant	-0.376***	-0.345***	-0.322***	-0.364***	-0.134***	0.0561
	(0.0170)	(0.110)	(0.0174)	(0.130)	(0.0132)	(0.129)
Observations	137,780	137,780	95,422	95,422	95,503	95,503
R-squared	0.617	0.619	0.617	0.619	0.648	0.651
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Municipal Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.726***	0.726***	1.091***	1.091***	0.362***	0.362***
	(0.0333)	(0.0333)	(0.0500)	(0.0500)	(0.0350)	(0.0350)
Constant	0.135***	0.135***	0.166***	0.166***	0.396***	0.396***
	(0.0120)	(0.0120)	(0.0121)	(0.0121)	(0.00837)	(0.00837)
Observations	193,550	193,550	145,429	145,429	145,547	145,547
R-squared	0.602	0.602	0.606	0.606	0.643	0.643
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2013 to May 2016. This is a sample of 748215 different individuals who had a payroll loan during this period from SCR. From this sample, we selected individuals with a flag indicating they were state civil employees (Panel A) or municipal civil servants (Panel B). We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table B8: Formal Employees and Loan Portability - II

	Formal Employees					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	1.013***	0.988***	1.636***	1.601***	0.414***	0.418***
	(0.0390)	(0.0390)	(0.0537)	(0.0548)	(0.0406)	(0.0407)
Constant	-1.064***	-1.003***	-1.061***	-1.218***	-0.729***	-0.369
	(0.0174)	(0.194)	(0.0179)	(0.244)	(0.0128)	(0.250)
Observations	139,406	139,406	95,478	95,478	95,552	95,552
R-squared	0.501	0.504	0.536	0.539	0.566	0.566
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2013 to May 2016. This is a sample of 748215 individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals who have a flag indicating they are formal employees. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table B9: Income and Loan Portability - II

	Panel (a): Low Income					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.223***	0.223***	0.233***	0.233***	0.214***	0.214***
	(0.0182)	(0.0182)	(0.0199)	(0.0199)	(0.0228)	(0.0228)
Constant	1.090***	1.090***	1.122***	1.122***	1.134***	1.134***
	(0.00582)	(0.00582)	(0.00407)	(0.00407)	(0.00467)	(0.00467)
Observations	227,668	227,668	177,730	177,730	177,894	177,894
R-squared	0.756	0.756	0.741	0.741	0.729	0.729
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Middle Income					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	1.322***	1.375***	1.614***	1.671***	1.034***	1.080***
	(0.0311)	(0.0312)	(0.0332)	(0.0335)	(0.0427)	(0.0421)
Constant	0.202***	0.0113	0.311***	0.159	0.387***	0.191**
	(0.0102)	(0.0812)	(0.00704)	(0.0976)	(0.00903)	(0.0964)
Observations	221,734	221,734	171,800	171,800	171,960	171,960
R-squared	0.576	0.578	0.577	0.578	0.530	0.534
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): High Income					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	1.179***	1.192***	1.814***	1.848***	0.557***	0.579***
	(0.0370)	(0.0370)	(0.0488)	(0.0489)	(0.0411)	(0.0412)
Constant	0.0831***	-0.186*	0.105***	-0.160	0.319***	0.0733
	(0.0143)	(0.107)	(0.0128)	(0.125)	(0.0107)	(0.129)
Observations	184,483	184,483	135,517	135,517	135,703	135,703
R-squared	0.534	0.534	0.559	0.561	0.542	0.544
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2013 to May 2016. This is a sample of 748215 individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals that have a flag indicating they had income up to 2 minimum wages (panel (a), low income), income between 2 to 5 minimum wages (panel (b), middle income), or income above five minimum wages (panel (c), high income). We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table B10: Smaller Cities and Loan Portability - II

	Panel (a): Municipalities with less than 200,000 inhabitants					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0357***	0.0401***	0.0248***	0.0302***	0.0470***	0.0479***
	(0.00351)	(0.00366)	(0.00379)	(0.00407)	(0.00439)	(0.00446)
Constant	4.475***	4.510***	4.479***	4.508***	4.407***	4.447***
	(0.000813)	(0.0120)	(0.000556)	(0.0141)	(0.000646)	(0.0140)
Observations	287,815	287,815	226,865	226,865	227,077	227,077
R-squared	0.950	0.951	0.949	0.949	0.942	0.942
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Municipalities with up to four different bank brands					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0449***	0.0472***	0.0433***	0.0462***	0.0468***	0.0472***
	(0.00390)	(0.00397)	(0.00457)	(0.00462)	(0.00494)	(0.00503)
Constant	4.425***	4.459***	4.424***	4.457***	4.396***	4.432***
	(0.000735)	(0.0128)	(0.000520)	(0.0144)	(0.000563)	(0.0148)
Observations	253,206	253,206	209,534	209,534	209,799	209,799
R-squared	0.944	0.944	0.942	0.942	0.940	0.940
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): One bank (control) x Two banks (treatment)					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.00436	0.00306	0.00232	0.00831	0.00668	8.19e-05
	(0.00624)	(0.00612)	(0.00854)	(0.00858)	(0.00720)	(0.00716)
Constant	4.438***	4.442***	4.443***	4.435***	4.426***	4.435***
	(0.00121)	(0.0193)	(0.00101)	(0.0225)	(0.000844)	(0.0198)
Observations	101,389	101,389	83,316	83,316	83,581	83,581
R-squared	0.948	0.949	0.947	0.948	0.947	0.948
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities. In Panel (a), we include all municipalities that had less than 200 thousand inhabitants in December 2013. In Panel (b), we include all cities that had up to 4 different bank brands in December 2013. In Panel (c), we include municipalities that have one bank in the control group and two different banks in the treatment group.

Table B11: Changing the Treatment Date and Loan Portability - II

	Treatment date: May 2014					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat x Post	0.0345***	0.0390***	0.0211***	0.0266***	0.0481***	0.0490***
	(0.00340)	(0.00355)	(0.00366)	(0.00394)	(0.00420)	(0.00427)
Constant	4.490***	4.525***	4.495***	4.525***	4.411***	4.449***
	(0.000700)	(0.0118)	(0.000482)	(0.0139)	(0.000552)	(0.0138)
Observations	295,023	295,023	230,469	230,469	230,681	230,681
R-squared	0.953	0.953	0.951	0.951	0.943	0.943
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. We include all municipalities and change the treatment date to May 2014; we say that a municipality is treated in case it had at least two different bank branches in May 2014. We also say it is a control city otherwise. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table B12: Excluding Cities Without Financial Services and Loan Portability - II

	Excluding municipalities without financial service point					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0322***	0.0371***	0.0184***	0.0242***	0.0463***	0.0475***
	(0.00348)	(0.00365)	(0.00373)	(0.00405)	(0.00430)	(0.00439)
Constant	4.491***	4.525***	4.498***	4.525***	4.412***	4.449***
	(0.000848)	(0.0118)	(0.000583)	(0.0139)	(0.000675)	(0.0138)
Observations	289,988	289,988	225,434	225,434	225,646	225,646
R-squared	0.953	0.954	0.952	0.952	0.943	0.944
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We excluded 95 municipalities that did not have a banking hub (such as bank branches, financial service points, or correspondent banking arrangements) in December 2013. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

B.3 Non-Earmarked Loans

B.4 Interest Rates

Table B13: Impact of the Loan Portability on Selected Non-Earmarked Loans by Municipalities - I

	Panel (a): Overdraft Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	15.98***	14.96***	22.59***	20.95***	10.99***	10.72***
	(0.882)	(0.902)	(1.056)	(1.105)	(1.101)	(1.105)
Constant	119.9***	52.56***	117.6***	50.89***	121.2***	73.13***
	(0.231)	(7.553)	(0.183)	(9.477)	(0.185)	(9.898)
Observations	266,207	266,207	203,318	203,318	203,473	203,473
R-squared	0.617	0.621	0.612	0.615	0.576	0.579
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Revolving Credit Card Loans					
Treat (Dec 2013) x Post	-5.780***	-7.796***	-4.109***	-6.648***	-7.454***	-8.544***
	(1.152)	(1.159)	(1.235)	(1.269)	(1.382)	(1.380)
Constant	212.8***	158.7***	212.0***	157.6***	212.9***	156.2***
	(0.285)	(6.635)	(0.196)	(7.927)	(0.219)	(7.589)
Observations	293,827	293,827	229,273	229,273	229,485	229,485
R-squared	0.556	0.564	0.528	0.535	0.515	0.522
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): Installment Credit Card Loans					
Treat (Dec 2013) x Post	7.235***	5.033***	17.59***	14.75***	-3.082***	-3.627***
	(0.906)	(0.878)	(1.145)	(1.121)	(1.097)	(1.069)
Constant	62.81***	50.39***	60.33***	49.96***	61.10***	47.04***
	(0.228)	(4.212)	(0.185)	(5.017)	(0.177)	(4.634)
Observations	289,396	289,396	224,872	224,872	225,054	225,054
R-squared	0.403	0.414	0.407	0.415	0.362	0.371
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

Table B14: Impact of the Loan Portability on Selected Non-Earmarked Loans by Municipalities - II

	Panel (a): Personal Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-0.0954	2.118***	1.926***	4.791***	-2.126***	-0.189
	(0.506)	(0.485)	(0.607)	(0.601)	(0.580)	(0.544)
Constant	102.6***	78.16***	103.3***	79.78***	101.5***	77.55***
	(0.115)	(2.040)	(0.0883)	(2.406)	(0.0842)	(2.215)
Observations	267,164	267,164	208,700	208,700	208,892	208,892
R-squared	0.788	0.799	0.775	0.786	0.765	0.776
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Auto Loans					
Treat (Dec 2013) x Post	0.0296	0.0334	0.00387	0.0186	0.0562	0.0646
	(0.0482)	(0.0486)	(0.0489)	(0.0493)	(0.0563)	(0.0577)
Constant	25.55***	25.28***	25.60***	25.28***	25.67***	25.17***
	(0.0119)	(0.263)	(0.00773)	(0.330)	(0.00889)	(0.315)
Observations	294,789	294,789	230,235	230,235	230,447	230,447
R-squared	0.676	0.678	0.657	0.659	0.651	0.652
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): Goods Loans					
Treat (Dec 2013) x Post	-5.672***	-4.890***	-5.534***	-4.388***	-5.772***	-5.060***
	(0.562)	(0.559)	(0.636)	(0.645)	(0.655)	(0.651)
Constant	77.71***	60.80***	78.07***	63.26***	77.34***	54.67***
	(0.144)	(2.617)	(0.105)	(3.164)	(0.108)	(2.945)
Observations	284,430	284,430	219,891	219,891	220,150	220,150
R-squared	0.487	0.494	0.468	0.475	0.465	0.471
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

B.5 Volume of Credit per Capita

Table B15: Impact of the Loan Portability on Selected Non-Earmarked Loans by Municipalities - III

	Panel (a): Overdraft Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	2.006***	1.839***	2.213***	1.999***	1.769***	1.619***
	(0.0402)	(0.0400)	(0.0430)	(0.0471)	(0.0499)	(0.0493)
Constant	-0.822***	-0.357***	-0.603***	0.210*	-0.580***	0.148
	(0.0105)	(0.0961)	(0.00748)	(0.125)	(0.00839)	(0.127)
Observations	266,207	266,207	203,318	203,318	203,473	203,473
R-squared	0.668	0.686	0.656	0.675	0.623	0.646
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Revolving Credit Card Loans					
Treat (Dec 2013) x Post	-0.190***	-0.209***	-0.281***	-0.304***	-0.0995***	-0.123***
	(0.0144)	(0.0151)	(0.0144)	(0.0159)	(0.0170)	(0.0175)
Constant	0.566***	0.995***	0.534***	0.967***	0.261***	0.666***
	(0.00356)	(0.0612)	(0.00229)	(0.0735)	(0.00270)	(0.0697)
Observations	293,827	293,827	229,273	229,273	229,485	229,485
R-squared	0.742	0.744	0.732	0.733	0.676	0.677
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): Installment Credit Card Loans					
Treat (Dec 2013) x Post	-0.0644***	-0.0438***	-0.0312**	-0.00345	-0.0984***	-0.0764***
	(0.0146)	(0.0147)	(0.0144)	(0.0151)	(0.0182)	(0.0182)
Constant	0.347***	0.423***	0.307***	0.395***	0.0521***	0.163**
	(0.00366)	(0.0658)	(0.00233)	(0.0816)	(0.00293)	(0.0796)
Observations	289,396	289,396	224,872	224,872	225,054	225,054
R-squared	0.749	0.751	0.744	0.746	0.672	0.674
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

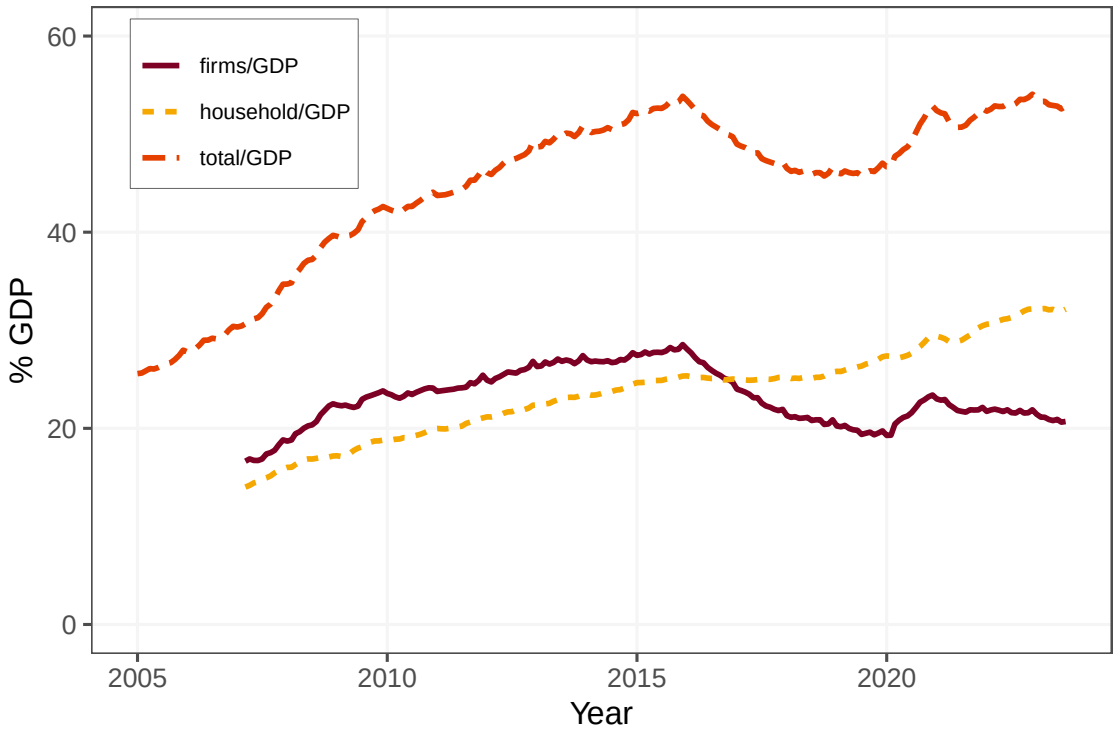
Table B16: Impact of the Loan Portability on Selected Non-Earmarked Loans by Municipalities - IV

	Panel (a): Personal Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0318***	0.0328***	0.0228**	0.0266***	0.0410***	0.0361***
	(0.00816)	(0.00836)	(0.00891)	(0.00946)	(0.00991)	(0.00991)
Constant	3.263***	3.500***	3.229***	3.431***	3.121***	3.360***
	(0.00185)	(0.0315)	(0.00130)	(0.0368)	(0.00144)	(0.0369)
Observations	267,164	267,164	208,700	208,700	208,892	208,892
R-squared	0.917	0.917	0.914	0.915	0.904	0.905
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (b): Auto Loans					
Treat (Dec 2013) x Post	-0.0363***	-0.0403***	-0.0452***	-0.0503***	-0.0273***	-0.0286***
	(0.00748)	(0.00730)	(0.00762)	(0.00739)	(0.00861)	(0.00857)
Constant	3.961***	4.016***	3.918***	3.948***	3.771***	3.786***
	(0.00185)	(0.0396)	(0.00121)	(0.0504)	(0.00136)	(0.0477)
Observations	294,789	294,789	230,235	230,235	230,447	230,447
R-squared	0.938	0.938	0.932	0.933	0.921	0.921
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES
	Panel (c): Goods Loans					
Treat (Dec 2013) x Post	-0.202***	-0.236***	-0.316***	-0.367***	-0.0904***	-0.113***
	(0.0194)	(0.0199)	(0.0212)	(0.0221)	(0.0244)	(0.0245)
Constant	0.651***	0.400***	0.600***	0.333***	0.435***	0.0375
	(0.00497)	(0.0737)	(0.00352)	(0.0871)	(0.00403)	(0.0879)
Observations	284,430	284,430	219,891	219,891	220,150	220,150
R-squared	0.802	0.804	0.794	0.797	0.781	0.783
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of the loan portability on payroll loans per capita (in ln) by municipalities. The treatment date is December 2013. The sample range is from January 2012 to May 2016. We include all municipalities. The controls used in columns (2), (4), and (6) are latitude and longitude interacted with time-varying coefficients. In columns (3) and (4), we have a sample of treated municipalities with HHI below or equal to the median HHI for treated municipalities. In columns (5) and (6), we have a sample of municipalities with a HHI above the median HHI of treated municipalities.

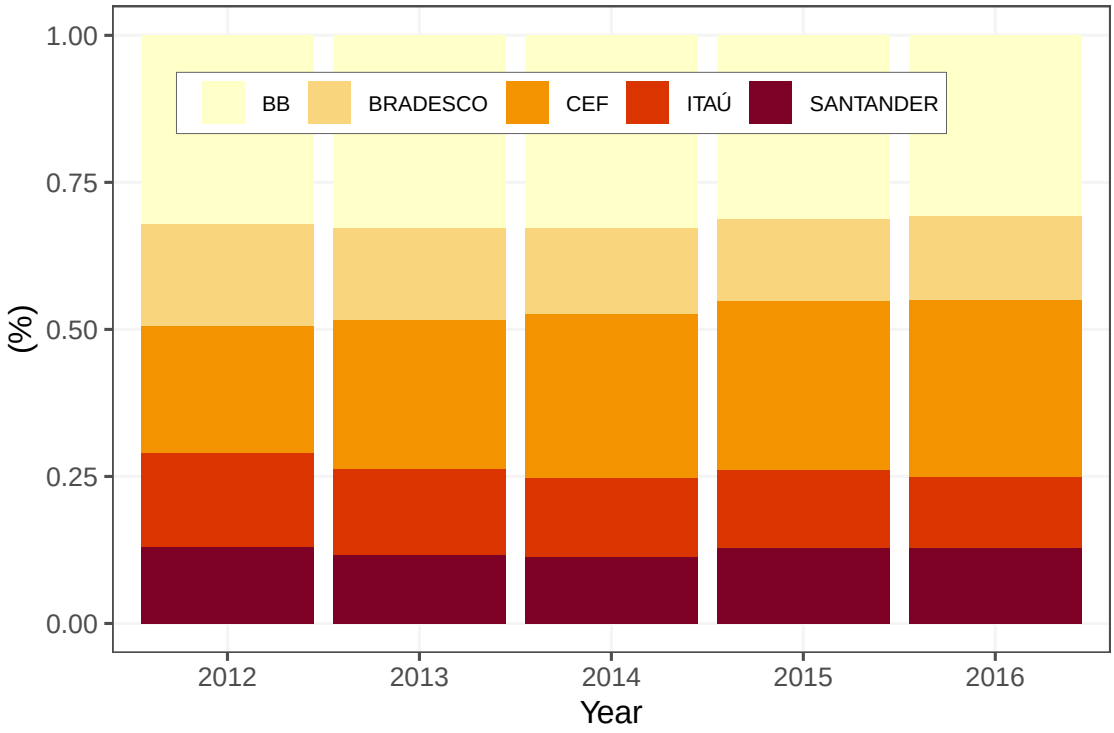
C Figures

Figure C2: Total Credit (as percentage of GDP)



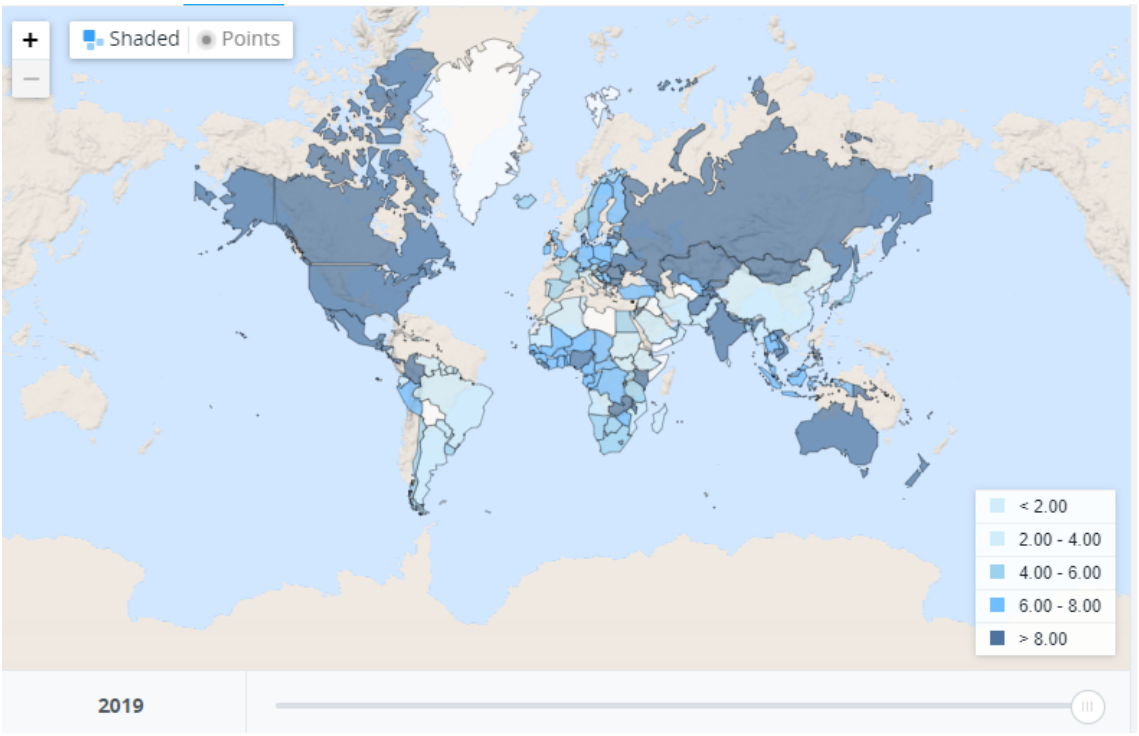
Notes: This figure shows the total credit to GDP, household credit to GDP, and total firms credit to GDP. Authors' calculation using SGS-BCB.

Figure C3: Total New Loans by Banks



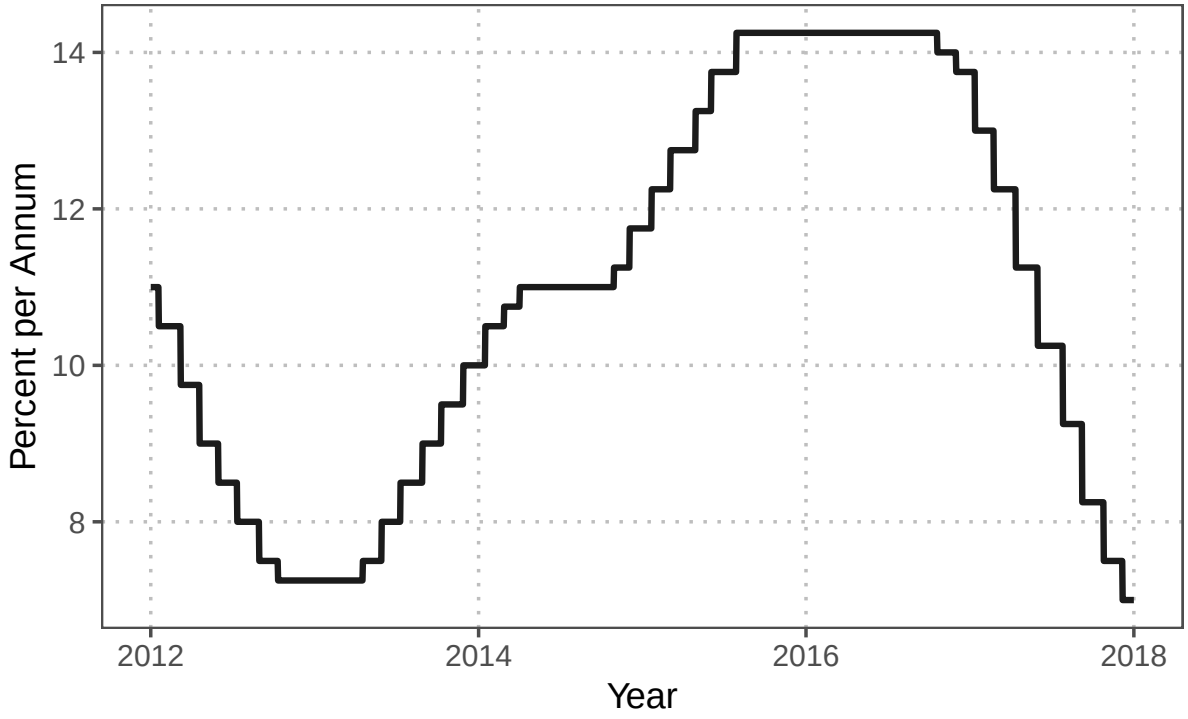
Notes: The figure displays the total new bank loans by banks. Around 80% of the total credit volume extended to firms and households originated from just these five banks in the country. Authors' calculation using Estban-BCB.

Figure C4: Strength of Legal Rights Index



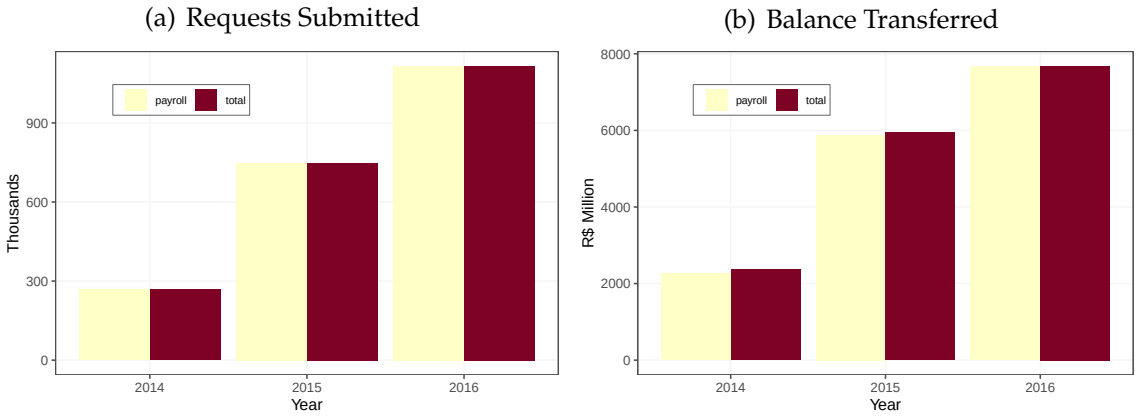
Notes: Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed to expand access to credit. Data from the World Bank.

Figure C5: Selic Interest Rate (BCB)



Notes: The figure shows the daily Selic interest rate from January 2012 to January 2018. Authors' calculation using SGS-BCB.

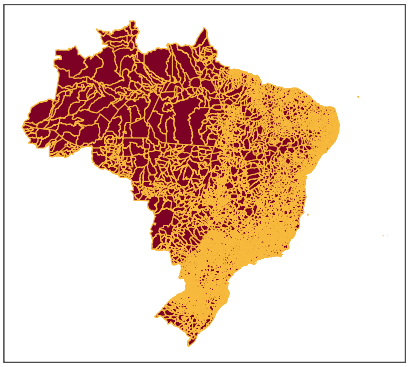
Figure C6: Requests for Credit Portability Submitted; Total Balance Transferred via Portability



Notes: Panel (a) displays the request for credit portability submitted. Panel (b) displays the total balance transferred via portability. Authors' calculation based on SCR-BCB.

Figure C7: Municipality vs. Micro-Region

(a) Municipalities in Brazil, 2013



(b) Micro-Regions in Brazil, 2013

Notes: Authors' calculation using IBGE and GeoBr.