Cutting Switching Costs in Credit Markets: The Impact of Brazil's 2014 Loan Portability Reform *

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Abstract

We test whether lowering borrower switching costs intensifies bank competition. We exploit a 2014 reform by Brazil's central bank that created a national framework for loan portability, allowing borrowers to refinance existing loans at rival banks. Using an event-study difference-in-differences design across municipalities, we find that effective annualized borrowing rates on payroll loans decline by about 19 basis points on average relative to the pre-reform mean, with larger reductions in ex-ante less concentrated markets. Credit quantities respond in the predicted direction: payroll-loan credit per capita rises by approximately 6% overall and by up to 10% in more competitive markets. Heterogeneity aligns with portability frictions, with larger effects for borrower groups and markets where outside options are more viable. Pre-treatment coefficients are small and statistically indistinguishable from zero, and the results are robust to alternative exposure and timing definitions. The joint price–quantity pattern indicates that reducing switching costs increases market contestability, compresses bank markups, and expands credit in the most exposed segments.

Keywords: bank competition; loan portability; switching costs; consumer credit; interest rates
JEL codes: G21, E44, E58, G53

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1 Introduction

Consumer credit markets are characterized by persistent frictions that limit competition, even in the absence of explicit barriers to entry. One such friction is the cost borrowers face when switching lenders. High switching costs can soften competition by weakening outside options, allowing incumbent banks to sustain high markups and limiting the pass-through of competitive pressure to borrowers. Despite their importance, credible empirical evidence on whether reducing borrower switching costs intensifies bank competition remains limited.

This paper studies the competitive effects of lowering borrower switching costs in consumer credit markets. We exploit a nationwide reform introduced by the Central Bank of Brazil in December 2013 that created a standardized framework for loan portability, allowing borrowers to refinance an existing loan at a rival bank without incurring contractual penalties. The reform sharply reduced switching frictions by mandating electronic information sharing, strict execution timelines, and standardized procedures across banks. Crucially, the reform applied uniformly nationwide and did not alter loan eligibility, pricing regulation, or bank entry, making it well suited to isolate the role of switching costs in shaping competition.

Our empirical strategy uses an event-study difference-in-differences design across municipalities, exploiting cross-sectional variation in local banking market structure. We show that loan portability led to a statistically and economically significant reduction in borrowing costs. Effective annualized interest rates on payroll loans fall by 0.187 percentage points (approximately 19 basis points) relative to a pre-reform mean of 28.9% per year. The effects are substantially larger in municipalities with lower ex-ante concentration—where borrowers face more viable outside options—with interest rates declining by up to 0.250 percentage points.

Quantities respond in the predicted direction. Payroll-loan credit per capita increases by 5.6% on average following the reform, with larger increases ranging from 6.75% to 9.83% in less concentrated markets. The joint decline in prices and expansion of quantities is consistent with a supply-side response driven by increased competitive pressure, rather than shifts in borrower demand alone.

The pattern of heterogeneity provides further support for a switching-cost

mechanism. Interest rate reductions are largest for borrower segments with higher portability exposure, such as civil servants and middle-income borrowers, and are amplified in markets where alternative lenders are more readily available. Pre-treatment coefficients are small and statistically indistinguishable from zero, supporting the parallel trends assumption. The results are robust to alternative exposure definitions, timing assumptions, and sample restrictions.

We interpret these findings through the lens of contestable market theory. Lowering switching costs strengthens borrowers' outside options, increasing the elasticity of demand faced by incumbent banks. Even when realized switching remains limited, the threat of borrower reallocation disciplines pricing. Consistent with this mechanism, we show that bank markups compress following the reform, particularly in markets where outside options are credible.

This paper contributes to several strands of the literature. First, it provides causal evidence that reducing borrower switching costs intensifies competition in consumer credit markets, affecting both prices and quantities. Second, it shows that competition operates through contestability rather than entry or physical bank presence, highlighting the importance of outside options in concentrated markets. Third, it contributes to the household finance literature by demonstrating that institutional reforms targeting frictions in refinancing can generate meaningful gains for borrowers. Finally, the findings inform policy debates on credit portability and open banking by showing that reducing switching costs can improve borrower terms even in highly concentrated banking systems.

The remainder of the paper proceeds as follows. Section 2 describes the institutional setting and the loan portability reform. Section 3 outlines the empirical strategy. Section 4 presents the effects of loan portability on prices and quantities. Section 5 investigates the competition and markup mechanisms. Section 6 presents some robustness checks. Section 7 concludes.

2 Institutional Background: Payroll Loans and Credit Portability

This section provides an institutional background crucial for understanding the analysis of Brazil's 2014 loan portability reform, detailing the data sources,

banking market structure, and the specifics of loan portability and payroll loans. For detailed information, see Appendix .

2.1 Data Sources

The study mainly uses the **Sistema de Informação de Crédito (SCR)**, Brazil's Central Bank credit registry, which offers comprehensive data on interest rates, loan amounts, maturities, and credit risks. It covers all credit relationships above a threshold. The reporting threshold has changed over time: R$ 5,000 from January 2003 to December 2011, R$ 1,000 from January 2012 to May 2016, and R$ 200 starting in June 2016. Another key source is the **Estatística Bancária Mensal por município (ESTBAN)**, providing monthly bank statistics by municipality. This dataset includes information on banking conglomerate balance sheets, branch numbers, and loan details, enabling the calculation of market shares and concentration measures. It is important to note that ESTBAN and SCR use different definitions for loan location and measure of lending (flows vs. stocks of loans, respectively). Additional data comes from the Brazilian Institute of Geography and Statistics (IBGE) for municipality-level socio-economic characteristics like population and GDP, and SGS (Time Series Management Series) from the Central Bank for publicly available data.

2.2 Banking Markets

The analysis covers the period from January 2013 to May 2016 and includes approximately 15 million individuals from SCR. We define the municipality as the relevant local banking market, a standard approach in the empirical banking literature.

In 2013, a substantial share of Brazilian municipalities exhibited limited physical bank presence: 22.2% had only one bank branch and 34.1% had no bank branches at all. Among municipalities with a single branch, approximately 66% were served exclusively by publicly owned banks. Despite this limited branch coverage, virtually all municipalities had access to financial services through alternative delivery channels.

In particular, the Brazilian financial system relies heavily on correspondent banking arrangements, electronic service points, and other non-branch out-

lets, which together account for the majority of customer access points nationwide. According to the Central Bank of Brazil, correspondents alone represented roughly 70% of all financial service points in 2014, and almost every municipality had at least one point of financial access, even in the absence of a physical bank branch.[1]

This institutional structure implies that municipalities without bank branches are not financially isolated. Instead, banking hubs and correspondent networks ensure widespread access to basic financial services, allowing us to treat municipalities as integrated local banking markets while still capturing meaningful variation in competitive conditions.

2.3 Loan Portability

To foster competition, the Brazilian Central Bank introduced Resolution No. 4,292 on December 20, 2013, effective May 2014. This resolution established a national framework for consumer credit portability, allowing borrowers to refinance existing loans with rival banks. This was a significant improvement over the less effective 2006 resolution. The new rules enhanced transparency, standardized procedures, mandated an electronic platform for information exchange, and imposed strict timelines and penalties for non-compliance. Crucially, consumers were exempted from portability costs, except for housing loans.

The portability process involves a customer negotiating new terms with a rival institution, which then handles the transfer. While the original bank cannot deny portability, it can offer a counter-offer. This resolution enabled portability for personal, payroll, vehicle, and mortgages, but excluded overdrafts and revolving credit.

Payroll loans dominated portability requests and transferred balances, accounting for over 99.9% of requests and 97.9% of the transferred balance between May 2014 and December 2016. This is attributed to their greater flexibility compared to other asset-backed loans. Retirees constituted approximately 75% of ported payroll loans, with civil servants making up almost all the remaining quarter. The study focuses on portability's impact on banking competition, occurring during a period of monetary policy tightening, suggesting the findings

[1]See Banco Central do Brasil, *Relatório de Inclusão Financeira*, No. 3 (2015). The report documents the nationwide coverage of financial access points, including bank branches, service posts, electronic points, and banking correspondents, across all 5,570 Brazilian municipalities.

are driven by market rivalry rather than monetary policy easing – in January 2013, the Central Bank Policy Rate (Selic) was 7.25% p.a. compared to 14.25% p.a. in April 2016 (after 16 consecutive rate hikes by the Central Bank).

2.4 Payroll Loans

Payroll loans involve direct deduction of principal and interest from the borrower's payroll or social security benefits, making them available to civil servants, retirees, pensioners, and some formal workers. This mechanism inherently lowers default risk, resulting in significantly lower interest rates compared to other credit types. During the study period, the average annual interest rate for payroll loans was approximately 28.5%. Civil servants generally secured lower rates, despite upper-interest ceilings for retirees being lower. For formal workers, the ability to obtain a payroll loan depends on an agreement between the bank and the paying source.

Payroll loans represent a substantial portion of non-earmarked credit, accounting for about 36% of the total volume and steadily increasing from 30% in 2012 to 41.5% in 2016. In terms of volume, civil servants held 61% of payroll loans, retirees 30.5%, and private employees 8.6%.

3 Empirical Strategy

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.

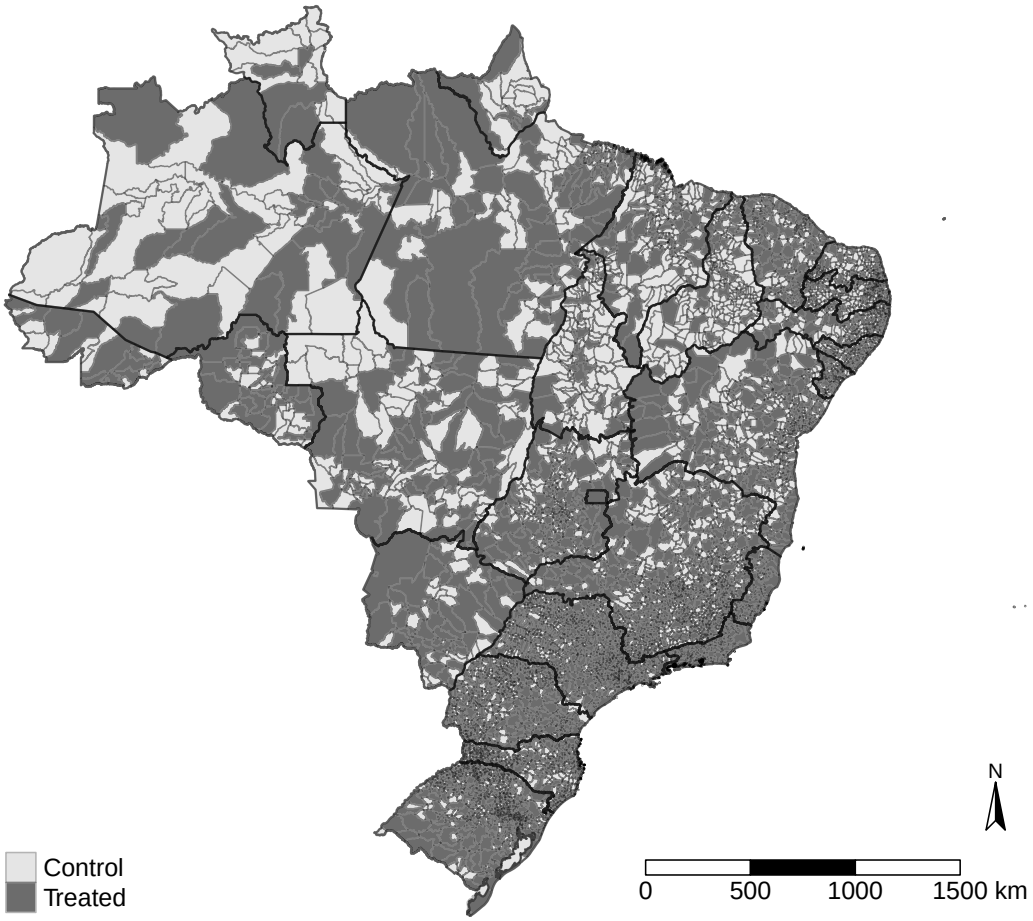
To overcome this identification challenge, we employ Resolution No. 4,292 as a source of exogenous variation in local competition and investigate how this event affected different municipalities. This institutional change provides a

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 use 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 1 visually demonstrates the divergent exposure levels across municipalities in the treated and control groups.

Figure 1: 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:

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

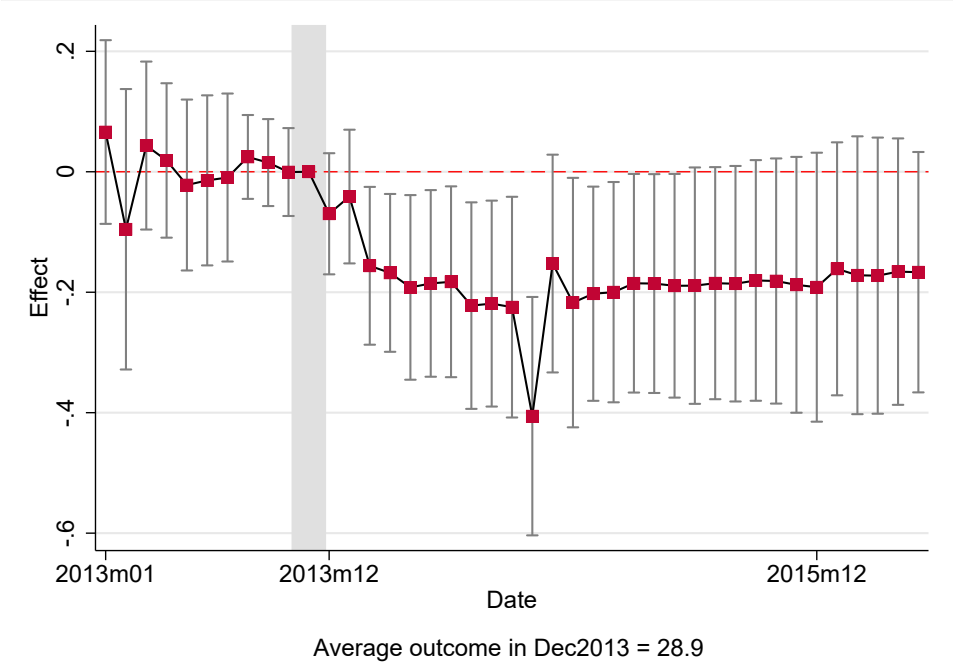
where $y_{m,t}$ is consumer loans per capita (in ln) or interest rate for municipality m in month/year t; γ_m and γ_t are municipality and time fixed-effects; X_m is a vector of control variables; $TREAT_m$ is a dummy that is equal to one if a municipality has more than one different bank brands in time t; $TREAT_m \times$

$POST_t$ is the interaction of the dummy with Loan Portability Resolution.

The cornerstone of our event study relies on the parallel trends assumption, which posits that in the absence of the loan portability regulation, the interest rate trends for the treatment and control groups would have followed a comparable path over time. The figure shows the estimated effect on interest rates, measured in percentage points, from January 2013 to the end of 2015. The gray-shaded vertical bar indicates the period in which the regulatory framework for consumer loan portability was introduced in late 2013. The series of point estimates (red squares) before the gray bar consistently hover around the zero line, and their corresponding confidence intervals (vertical bars) all overlap with the zero line. This indicates that there were no statistically significant differences in interest rate trends between the treatment and control groups before the policy was enacted, providing critical validation of the parallel trend assumption. Following the introduction of the regulation, the estimated effect on interest rates declines and remains consistently negative. The point estimates drop to below -0.2 percentage points, and more importantly, the confidence intervals no longer overlap with the zero line. This persistent and statistically significant negative effect demonstrates that the loan portability regulation led to a measurable and sustained reduction in interest rates for the affected categories of loans, confirming the central finding of our study (Figure 2).

Figure 2: Event-study: interest rates around the loan-portability reform

(a) Interest Rate (% per annum)



Notes: Each point is the estimated treatment effect for month t relative to December 2013 ($t = -1$); whiskers show 95% CIs. The gray band marks the policy month. Pre-reform coefficients are near zero, supporting parallel trends; post-reform coefficients are negative and persistent, indicating a sustained decline in annualized interest rates in treated markets. The mean outcome in the reference month is 28.9% p.a. Authors' calculation using SCR-BCB.

Table 1 documents substantial heterogeneity in local banking market structure across Brazilian municipalities in 2013. Banking markets are highly concentrated: the average Herfindahl–Hirschman Index (HHI) exceeds 8,000, and the median equals 10,000, indicating that at least half of municipalities are effectively monopolistic at the branch level. The average municipality has 4.13 bank branches but only 1.98 distinct bank brands, reflecting limited within-market competition even where physical presence exists. Nearly half of municipalities have no bank branches at all, a share that rises to approximately 60% among control markets. In municipalities with bank presence, public banks play a central role: 58% of municipalities host at least one public bank, and public institutions account for roughly one-quarter of all branches.

Treated municipalities are systematically larger, richer, and more urbanized,

and exhibit lower—though still high—levels of concentration. In these markets, public banks are present in nearly all municipalities, and the average HHI is substantially lower than in control markets, though far from competitive. These patterns motivate our difference-in-differences design with municipality fixed effects and flexible controls, and underscore that meaningful variation in competitive exposure arises from differences in market structure rather than from changes in physical branch presence alone.

Despite high concentration and limited branch coverage, widespread financial access through correspondent banking and other non-branch delivery channels implies that most municipalities are not financially isolated. This institutional feature creates scope for competitive pressure once switching costs are reduced, allowing incumbent banks to be disciplined by the threat of borrower switching even in highly concentrated local markets.

Table 1: Descriptive Statistics

			Panel (a)			
Sample	N	mean	sd	p10	p50	p90
Bank branches (2013)	228239	4.13	41.38	0.00	1.00	5.00
Diff. bank brand (2013)	228239	1.98	2.83	0.00	1.00	5.00
HHI index (2013)	228239	8130.20	2583.04	3765.09	10000.00	10000.00
Public banks (Dec 2013)	228239	0.58	0.49	0.00	1.00	1.00
Pct public banks (Dec 2013)	228239	0.25	0.33	0.00	0.13	1.00
HHI index (Dec 2013)	228239	8124.04	2570.49	3838.19	10000.00	10000.00
No bank (Dec 2013)	228239	0.35	0.48	0.00	0.00	1.00
GDP per capita in 2011	227993	14437.31	17814.00	4528.89	10596.64	26716.68
GDP in 2011	227993	786976.06	8217793.44	28104.85	103079.46	902031.60
Urban population in 2010	227993	28938.15	201607.95	1523.00	6273.00	43057.00
			Panel (b)			
Control	N	mean	sd	p10	p50	p90
Bank branches (2013)	128750	0.39	0.49	0.00	0.00	1.00
Diff. bank brand (2013)	128750	0.39	0.49	0.00	0.00	1.00
HHI index (2013)	128750	9999.63	9.87	10000.00	10000.00	10000.00
Public banks (Dec 2013)	128750	0.26	0.44	0.00	0.00	1.00
Pct public banks (Dec 2013)	128750	0.22	0.41	0.00	0.00	1.00
HHI index (Dec 2013)	128750	10000.00	0.00	10000.00	10000.00	10000.00
No bank (Dec 2013)	128750	0.62	0.49	0.00	1.00	1.00
GDP per capita in 2011	128504	11343.25	12098.16	4226.59	7828.30	21020.32
GDP in 2011	128504	72625.17	76508.73	22735.72	52782.65	132308.33
Urban population in 2010	128504	4223.51	3351.02	1113.00	3275.00	8469.00
			Panel (c)			
Treat	N	mean	sd	p10	p50	p90
Bank branches (2013)	99489	8.97	62.34	2.00	4.00	10.00
Diff. bank brand (2013)	99489	4.04	3.25	2.00	4.00	6.00
HHI index (2013)	99489	5710.95	2220.58	3198.40	5108.86	9354.74
Public banks (Dec 2013)	99489	0.99	0.11	1.00	1.00	1.00
Pct public banks (Dec 2013)	99489	0.29	0.15	0.09	0.25	0.50
HHI index (Dec 2013)	99489	5696.33	2170.28	3322.07	5031.74	9299.28
GDP per capita in 2011	99489	18433.73	22579.66	5455.62	14038.02	32009.52
GDP in 2011	99489	1709660.45	12379102.59	105551.10	311270.99	2439888.21
Urban population in 2010	99489	60860.57	302197.76	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 on Prices and Quantities

This section examines the effects of the introduction of loan portability on interest rates and credit volumes using the empirical framework described in Section 3. We estimate Equation (1) using municipality-level data and exploit cross-sectional variation in local banking market structure to identify the causal impact of the reform.

We show that loan portability leads to a statistically and economically significant reduction in interest rates and a corresponding increase in credit volumes. These effects are concentrated in municipalities where borrowers face more viable outside options—namely, markets with lower concentration and multiple active lenders—consistent with a contestability mechanism in which lower switching costs increase the elasticity of demand faced by incumbent banks.

The results are robust across a range of specifications, including alternative sample restrictions, flexible controls for local economic conditions, and adjustments for differences in market structure. Importantly, the decline in lending rates occurs during a period of monetary tightening, indicating that the estimated effects reflect changes in competitive conditions rather than aggregate funding costs.

Together, the price and quantity responses provide complementary evidence that loan portability increased competitive pressure in local credit markets, operating primarily through the threat of borrower switching rather than through changes in physical bank presence or entry.

4.1 Interest Rates

Table 2 reports estimates from Equation (1) for effective annual interest rates on payroll loans, averaged at the municipality level over the period from January 2013 to May 2016. Each row corresponds to a dependent variable, and each column reports estimates from a distinct specification. The coefficient δ captures the difference-in-differences effect of loan portability on interest rates.

Columns (1)–(3) report results for the full sample. Columns (4)–(6) restrict the sample to municipalities with below-median concentration among treated markets, defined as those with an HHI below or equal to 5,109, while columns

(7)–(9) focus on municipalities with above-median concentration. All specifications include municipality and time fixed effects. Control variables—population and GDP per capita—are interacted with time-varying coefficients, and additional specifications restrict the sample to municipalities with at least one public bank or no banks in December 2013.

The results provide consistent evidence that the introduction of loan portability led to a reduction in effective interest rates not only for switchers but also for non-switchers. Across specifications, interest rates decline by approximately 0.19 to 0.25 percentage points in municipalities with more than one bank operating, relative to municipalities with only one or no bank. Given an average payroll loan spread of 18.7 percentage points (see Table D6, Appendix D) during this period, these estimates imply a reduction of more than 1% in average spreads attributable to the reform.

Importantly, the magnitude of the effect varies systematically with local market structure. The interest rate reduction is larger and statistically significant in municipalities with lower concentration, where borrowers face a greater set of viable outside options. In these markets, the estimated decline is approximately 0.25 percentage points. By contrast, in highly concentrated municipalities—where outside options are limited—the estimated effects are smaller in magnitude and statistically indistinguishable from zero.

This pattern is consistent with a contestability mechanism. Loan portability lowers switching costs, but its impact on prices depends on the credibility of outside options. Where alternative lenders are present, even if switching is infrequent, the threat of borrower reallocation disciplines incumbent pricing. In contrast, in markets with high concentration and limited lender presence, portability alone is insufficient to generate competitive pressure.

Finally, the observed decline in interest rates is unlikely to be driven by aggregate monetary policy conditions. The period following the introduction of loan portability coincides with an increase in the Central Bank of Brazil's policy rate (SELIC) (see Section 5). Moreover, focusing on loans that were actively refinanced through portability, Figure 3 shows that lending rates declined across most municipalities despite the tightening monetary stance (see also Figure F8 in Appendix C). These patterns reinforce the interpretation that the estimated effects reflect changes in competitive conditions rather than shifts in aggregate funding costs.

Table 2: Impact of the Loan Portability on the Effective Annual Interest Rate by Municipalities

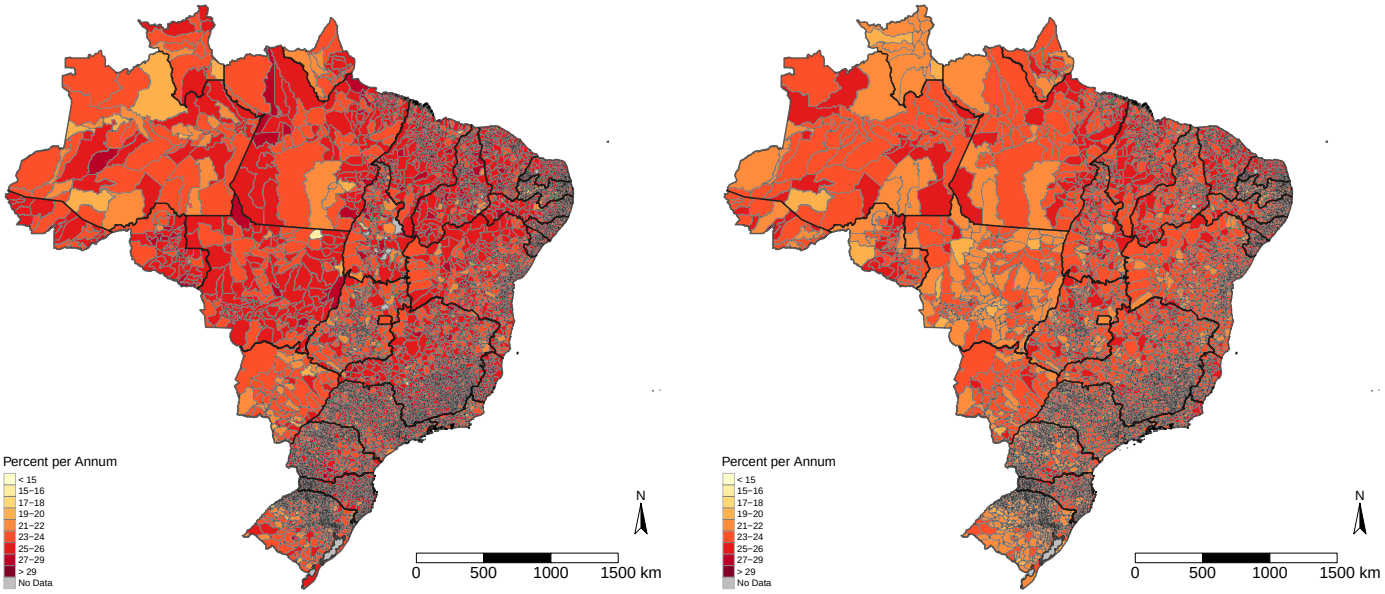
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	**-0.187***	**-0.187***	**-0.165***	**-0.250****	**-0.250****	**-0.234****	**-0.116**	**-0.116**	**-0.0836**
	(0.0912)	(0.0912)	(0.0849)	(0.120)	(0.120)	(0.110)	(0.0711)	(0.0711)	(0.0693)
Constant	28.93***	28.93***	28.91***	28.89***	28.89***	28.87***	28.97***	28.97***	28.95***
	(0.145)	(0.145)	(0.150)	(0.147)	(0.147)	(0.154)	(0.127)	(0.127)	(0.132)
Observations	228,062	228,062	210,647	178,370	178,370	162,062	178,297	178,297	160,923
R-squared	0.703	0.703	0.711	0.688	0.688	0.696	0.673	0.673	0.679
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unit). 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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013.

Figure 3: 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 3 reports estimates from Equation (1) for the logarithm of payroll loan volume per capita, averaged at the municipality level over the period from January 2013 to May 2016. As in the previous section, each row corresponds to a dependent variable and each column reports estimates from a distinct specification. The coefficient δ captures the difference-in-differences effect of loan portability on credit volumes.

Columns (1)–(3) present results for the full sample. Columns (4)–(6) restrict the sample to municipalities with below-median concentration among treated markets, defined as those with an HHI below or equal to 5,109, while columns (7)–(9) focus on municipalities with above-median concentration. All specifications include municipality and time fixed effects, as well as flexible controls for population and GDP per capita interacted with time-varying coefficients. Additional specifications restrict the sample to municipalities with at least one

public bank or no banks in December 2013.

Across specifications, loan portability is associated with an increase in the volume of payroll loans per capita. In the full sample, the estimated effect implies an increase of approximately 3.7% to 5.6% over the sample period, depending on the specification. These magnitudes are economically meaningful, particularly in light of the deceleration in aggregate payroll credit growth during this period, when year-over-year growth rates declined from 18.2% in 2013 to 6.7% in 2016.

The response of credit volumes varies systematically with local market structure. The increase in loan volume per capita is larger and more precisely estimated in municipalities with lower banking concentration, consistent with stronger competitive pressure and more credible outside options. In contrast, in highly concentrated markets, the estimated effects are smaller and less precisely estimated.

Taken together, these results indicate that loan portability not only reduced borrowing costs but also expanded credit volumes, particularly in markets where competition is more contestable. This pattern is consistent with a mechanism in which lower switching costs increase both price competition and borrowing, even in the absence of changes in physical bank presence.

Table 3: Impact of the Loan Portability on Payroll Loans (per capita) by Municipalities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	**0.0369**	**0.0369**	**0.0556***	**0.0675****	**0.0675****	**0.0983****	**0.0369**	**0.0369**	**0.0556***
	(0.0253)	(0.0253)	(0.0324)	(0.0317)	(0.0317)	(0.0425)	(0.0253)	(0.0253)	(0.0324)
Constant	3.938***	3.938***	3.902***	4.004***	4.004***	3.974***	3.938***	3.938***	3.902***
	(0.0894)	(0.0894)	(0.0877)	(0.0916)	(0.0916)	(0.0904)	(0.0894)	(0.0894)	(0.0877)
Observations	178,297	178,297	160,923	178,370	178,370	162,062	178,297	178,297	160,923
R-squared	0.918	0.918	0.919	0.924	0.924	0.925	0.918	0.918	0.919
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unit). 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. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013.

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[2] [3]. 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 in 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 4 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 (Panel (a) in Table 4).

Analyzing all public banks in the country, Panel (b) of Table 4 uncovers precisely the same pattern. There were no significant changes in lending rates at-

[2]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

[3]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

tributable to the portability regulation. 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 not observe any impact of the portability resolution on the volume of credit during this period in the specifications of Equation 1 in Table E12, in Appendix E, both in Panel (a) and Panel (b). We must acknowledge 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, we would expect a surge in credit supply per capita (in ln) presented in Table E12 still influenced by the results reported by Joaquim et al. (2023). However, this is not what our results indicate.

Table 4: Government-Owned Banks and Loan Portability

	Panel (a): Banco do Brasil								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	**-0.0899**	**-0.0899**	**-0.0899**	**-0.180**	**-0.180**	**-0.180**	**-0.000680**	**-0.000680**	**-0.000680**
	(0.104)	(0.104)	(0.104)	(0.134)	(0.134)	(0.134)	(0.0846)	(0.0846)	(0.0846)
Constant	28.82***	28.82***	28.82***	28.67***	28.67***	28.67***	28.89***	28.89***	28.89***
	(0.159)	(0.159)	(0.159)	(0.189)	(0.189)	(0.189)	(0.117)	(0.117)	(0.117)
Observations	124,206	124,206	124,206	76,024	76,024	76,024	75,999	75,999	75,999
R-squared	0.782	0.782	0.782	0.787	0.787	0.787	0.748	0.748	0.748
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (b): Government-Owned Bank								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	**-0.0838**	**-0.0838**	**-0.0838**	**-0.167**	**-0.167**	**-0.167**	**-0.00334**	**-0.00334**	**-0.00334**
	(0.0791)	(0.0791)	(0.0791)	(0.105)	(0.105)	(0.105)	(0.0605)	(0.0605)	(0.0605)
Constant	28.84***	28.84***	28.84***	28.73***	28.73***	28.73***	28.91***	28.91***	28.91***
	(0.163)	(0.163)	(0.163)	(0.193)	(0.193)	(0.193)	(0.139)	(0.139)	(0.139)
Observations	131,451	131,451	131,451	82,333	82,333	82,333	82,260	82,260	82,260
R-squared	0.771	0.771	0.771	0.767	0.767	0.767	0.736	0.736	0.736
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES

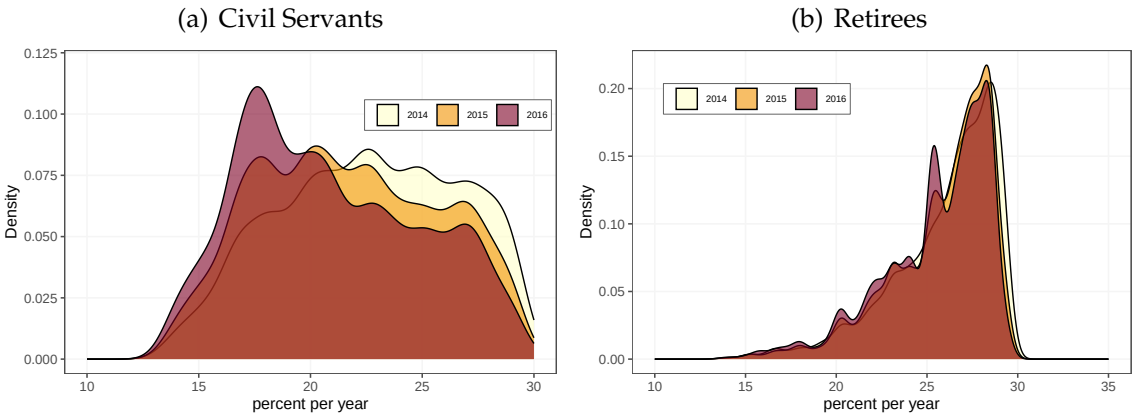
Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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 4: 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 4 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 4. 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. Also, the estimation of Equation 1 captures the

direct effect of the portability resolution (also presented in Figure 4) and the indirect impact (that is, the possibility of switching banks seeking to lower borrowing costs, may have had an impact in banks offering lower rates for their clients or incumbent banks when theatened by the portability possiblity accepting to lower interest rates).

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 2 and Table 3.

Table 5: Retirees and Loan Portability

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-0.153***	**-0.153***	**-0.121**	**-0.189****	**-0.189****	**-0.160***	**-0.148**	**-0.148**	**-0.113**
	(0.0781)	(0.0781)	(0.0759)	(0.0865)	(0.0865)	(0.0911)	(0.0874)	(0.0874)	(0.0834)
Constant	29.69***	29.69***	29.72***	29.59***	29.59***	29.64***	29.82***	29.82***	29.87***
	(0.116)	(0.116)	(0.117)	(0.104)	(0.104)	(0.108)	(0.116)	(0.116)	(0.117)
Observations	198,164	198,164	183,647	149,789	149,789	136,136	149,941	149,941	135,424
R-squared	0.453	0.453	0.459	0.445	0.445	0.452	0.442	0.442	0.448
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. This is a sample of 748,215 individuals who had a payroll loan during this period from SCR. From this sample, we selected the individuals with a flag indicating they are retired, men older than 65 years, and women who are older than 60 years.

The regression results outlined in Table 5 provide compelling evidence that the loan portability regulation indeed contributed to the reduction of interest rates for retirees, albeit ro a lesser extent compared to the reduction observed fot the entire sample (see Table 2). 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 B.5.1). In contrast, comparing these findings with those detailed in Table 6, 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 1.0 to 2.2 percentage points — a much higher reducgtion than the one observed in payroll lending rates for retirees (approximately -0.11 to -0.19 percentage points).

Table 6: Civil Servants and Loan Portability - I

	Panel (a): Civil Servant								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-1.480*** **	**-1.480*** **	**-1.611*** **	**-2.058*** **	**-2.058*** **	**-2.173*** **	**-1.013** **	**-1.013** **	**-1.122** **
	(0.364)	(0.364)	(0.406)	(0.309)	(0.309)	(0.345)	(0.460)	(0.460)	(0.500)
Constant	31.36***	31.36***	31.62***	30.58***	30.58***	31.01***	31.23***	31.23***	31.49***
	(0.821)	(0.821)	(0.791)	(0.666)	(0.666)	(0.641)	(0.892)	(0.892)	(0.869)
Observations	72,521	72,521	69,422	46,464	46,464	43,652	46,581	46,581	43,482
R-squared	0.481	0.481	0.479	0.497	0.497	0.492	0.479	0.479	0.477
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (b): Federal Civil Servant								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-1.425*** **	**-1.425*** **	**-1.393*** **	**-1.931*** **	**-1.931*** **	**-1.895*** **	**-1.135*** **	**-1.135*** **	**-1.092** **
	(0.422)	(0.422)	(0.464)	(0.530)	(0.530)	(0.556)	(0.407)	(0.407)	(0.454)
Constant	29.64***	29.64***	29.66***	29.79***	29.79***	29.88***	28.85***	28.85***	28.83***
	(0.788)	(0.788)	(0.810)	(0.762)	(0.762)	(0.761)	(0.913)	(0.913)	(0.928)
Observations	34,004	34,004	33,233	19,521	19,521	18,832	19,546	19,546	18,775
R-squared	0.420	0.420	0.421	0.430	0.430	0.430	0.404	0.404	0.404
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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).

Table 7: Civil Servants and Loan Portability - II

	Panel (a): State Civil Servant								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-1.412****	**-1.412****	**-1.516****	**-1.705*****	**-1.705*****	**-1.785*****	**-1.194***	**-1.194***	**-1.266**
	(0.573)	(0.573)	(0.624)	(0.505)	(0.505)	(0.549)	(0.697)	(0.697)	(0.757)
Constant	32.93***	32.93***	33.33***	32.41***	32.41***	33.18***	32.62***	32.62***	33.08***
	(1.191)	(1.191)	(1.202)	(1.054)	(1.054)	(1.080)	(1.180)	(1.180)	(1.219)
Observations	45,902	45,902	43,909	28,349	28,349	26,602	28,364	28,364	26,371
R-squared	0.478	0.478	0.474	0.495	0.495	0.485	0.473	0.473	0.467
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (b): Municipal Civil Servant								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-0.377*****	**-0.377*****	**-0.393****	**-0.509*****	**-0.509*****	**-0.526*****	**-0.261****	**-0.261****	**-0.272****
	(0.129)	(0.129)	(0.143)	(0.165)	(0.165)	(0.186)	(0.115)	(0.115)	(0.121)
Constant	29.68***	29.68***	29.79***	29.67***	29.67***	29.85***	29.80***	29.80***	29.95***
	(0.198)	(0.198)	(0.213)	(0.202)	(0.202)	(0.222)	(0.187)	(0.187)	(0.195)
Observations	186,739	186,739	174,089	138,678	138,678	126,974	138,829	138,829	126,179
R-squared	0.435	0.435	0.440	0.431	0.431	0.438	0.431	0.431	0.437
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES

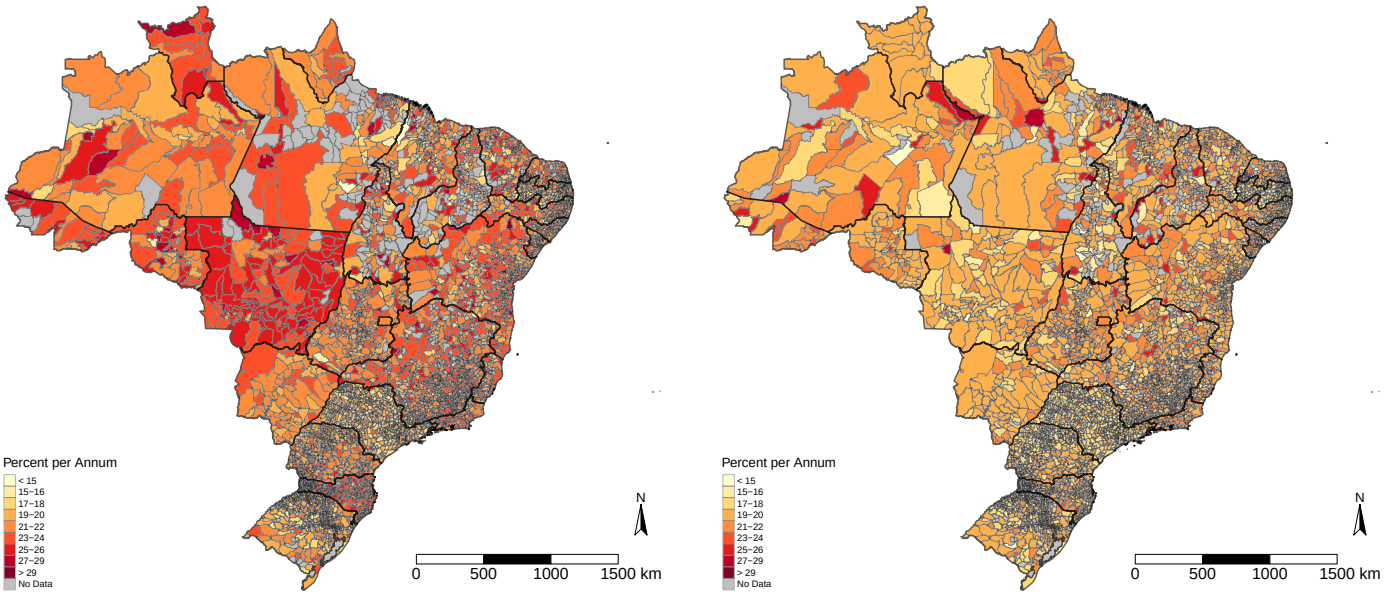
Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unity). The table shows the fixed effect estimate of the impact of loan portability on municipalities' effective annual interest rates. The treatment date is December 2013. The sample range is from January 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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).

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 B3 (see Cavalcanti and Santos

(2020) for further details on the benefits of being a civil servant in Brazil). 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 5 visually portrays the direct effect of the portability regulation. The figure displays the discernible decrease in interest rates for ported payroll loans extended to civil servants, spanning most municipalities nationwide.

Figure 5: 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 re-

sponsible for the loan. This fact is reflected in its higher interest rate, as shown in Panel (b) of Figure B3.

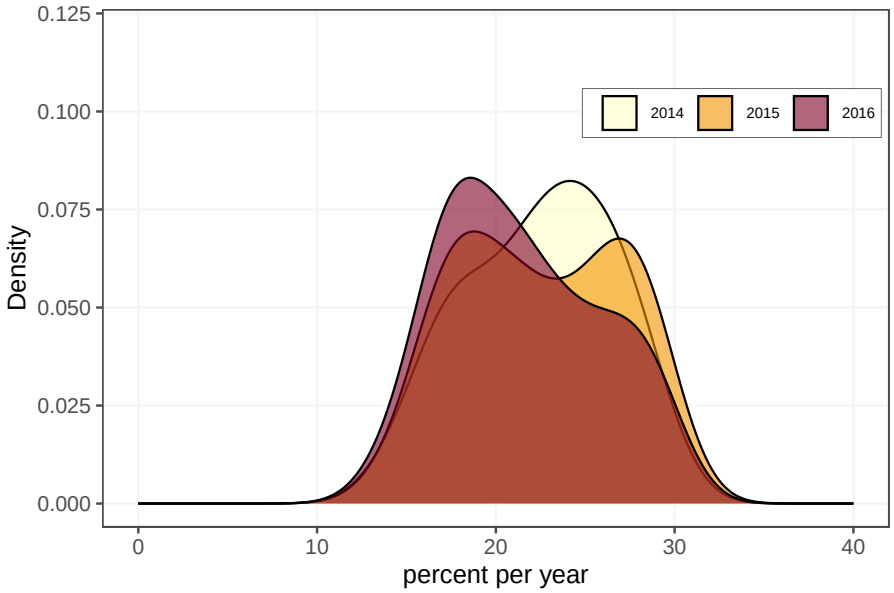
Figure 6 offers a visual insight into the distribution of lending rates for payroll loans transferred via portability from 2014 to 2016 for formal employees (that is, the direct effect). We observe that interest rates for ported loans moved to the left over the years, especially in 2016. This movement was not as pronounced as observed by civil servants thought. Table 8 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 8 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 less pronounced than the one observed for civil servants in Table 6 and Table 7.

Table 8: Formal Employees and Loan Portability

	Formal Employees								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-1.178*** **	**-1.178*** **	**-1.171*** **	**-1.431*** **	**-1.431*** **	**-1.424*** **	**-1.076*** **	**-1.076*** **	**-1.072*** **
	(0.313)	(0.313)	(0.337)	(0.334)	(0.334)	(0.363)	(0.318)	(0.318)	(0.344)
Constant	29.84***	29.84***	29.94***	29.90***	29.90***	30.04***	29.24***	29.24***	29.37***
	(0.460)	(0.460)	(0.512)	(0.480)	(0.480)	(0.542)	(0.489)	(0.489)	(0.553)
Observations	48,848	48,848	47,575	28,500	28,500	27,440	28,592	28,592	27,319
R-squared	0.558	0.558	0.556	0.578	0.578	0.574	0.558	0.558	0.555
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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.

Figure 6: 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.

Table 9: Non-Available Occupation and Loan Portability

	Non-Available Occupation								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**0.101**	**0.101**	**0.130**	**0.183**	**0.183**	**0.216**	**0.0292**	**0.0292**	**0.0558**
	(0.120)	(0.120)	(0.120)	(0.176)	(0.176)	(0.176)	(0.0775)	(0.0775)	(0.0783)
Constant	28.34***	28.34***	28.27***	28.36***	28.36***	28.27***	28.41***	28.41***	28.35***
	(0.132)	(0.132)	(0.125)	(0.144)	(0.144)	(0.140)	(0.133)	(0.133)	(0.122)
Observations	227,432	227,432	209,310	177,505	177,505	160,449	177,658	177,658	159,618
R-squared	0.671	0.671	0.666	0.667	0.667	0.660	0.667	0.667	0.661
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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 have non-available information about occupation.

4.3.3 Income

According to data extracted from the 2021 Financial Citizenship Report, published by the Central Bank of Brazil[4], 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

[4]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

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%.[5].

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 10); (ii) middle income, for those earning between 2 to 5 minimum wages (Panel (b) of Table 10); (iii) high income, comprising those earning more than five minimum wages (Panel (c) of Table 10). 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 2 and Table 3.

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 0.77 to 1.43 percentage points depending on the specification, in stark contrast to the 0.17 to 0.9 percentage point decrease observed among low-income individuals – it is worth noting that the reduction in interest rates for low income borrowers was statistically significant only in more competitive markets, with HHI below or equal median).

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). 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.

[5]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

Table 10: Income and Loan Portability

	Panel (a): Low Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-0.121**	**-0.121**	**-0.124**	**-0.172***	**-0.172***	**-0.187***	**-0.0818**	**-0.0818**	**-0.0730**
	(0.0781)	(0.0781)	(0.0847)	(0.0992)	(0.0992)	(0.108)	(0.0648)	(0.0648)	(0.0715)
Constant	29.77***	29.77***	29.82***	29.78***	29.78***	29.85***	29.88***	29.88***	29.94***
	(0.124)	(0.124)	(0.121)	(0.119)	(0.119)	(0.113)	(0.130)	(0.130)	(0.122)
Observations	210,615	210,615	194,711	161,196	161,196	146,317	161,385	161,385	145,481
R-squared	0.479	0.479	0.486	0.484	0.484	0.494	0.466	0.466	0.474
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES		NO	YES
	Panel (b): Middle Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-1.128*** **	**-1.128*** **	**-1.130*** **	**-1.427*** **	**-1.427*** **	**-1.416*** **	**-0.921*** **	**-0.921*** **	**-0.920*** **
	(0.301)	(0.301)	(0.279)	(0.304)	(0.304)	(0.316)	(0.322)	(0.322)	(0.255)
Constant	29.52***	29.52***	29.78***	29.37***	29.37***	29.81***	29.17***	29.17***	29.47***
	(0.394)	(0.394)	(0.423)	(0.426)	(0.426)	(0.457)	(0.341)	(0.341)	(0.357)
Observations	118,004	118,004	111,273	79,102	79,102	72,884	79,213	79,213	72,482
R-squared	0.459	0.459	0.460	0.468	0.468	0.470	0.461	0.461	0.463
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (c): High Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-0.991** **	**-0.991** **	**-1.071** **	**-1.287** **	**-1.287** **	**-1.345** **	**-0.766** **	**-0.766** **	**-0.834** **
	(0.422)	(0.422)	(0.423)	(0.487)	(0.487)	(0.491)	(0.365)	(0.365)	(0.362)
Constant	29.77***	29.77***	30.19***	29.87***	29.87***	30.72***	29.31***	29.31***	29.77***
	(0.510)	(0.510)	(0.508)	(0.562)	(0.562)	(0.469)	(0.430)	(0.430)	(0.422)
Observations	68,212	68,212	65,483	42,462	42,462	40,020	42,557	42,557	39,828
R-squared	0.482	0.482	0.484	0.496	0.496	0.499	0.483	0.483	0.486
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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).

Table 11: Non-Available Income and Loan Portability

	Non-Available Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**0.101**	**0.101**	**0.130**	**0.183**	**0.183**	**0.216**	**0.0292**	**0.0292**	**0.0558**
	(0.120)	(0.120)	(0.120)	(0.176)	(0.176)	(0.176)	(0.0775)	(0.0775)	(0.0783)
Constant	28.34***	28.34***	28.27***	28.36***	28.36***	28.27***	28.41***	28.41***	28.35***
	(0.132)	(0.132)	(0.125)	(0.144)	(0.144)	(0.140)	(0.133)	(0.133)	(0.122)
Observations	227,432	227,432	209,310	177,505	177,505	160,449	177,658	177,658	159,618
R-squared	0.671	0.671	0.666	0.667	0.667	0.660	0.667	0.667	0.661
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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 have non-available income information.

5 Mechanisms: Competition and Bank Markups

This section investigates the mechanism through which loan portability affects interest rates. We focus on a competition channel in which portability reduces switching costs, strengthens borrowers' outside options, and compresses bank markups. The key prediction is that banks facing a higher threat of customer switching respond by reducing lending spreads, even in the absence of realized switching.

5.1 Banking Concentration

Brazil's banking sector is highly concentrated. The five largest banks jointly hold approximately 80% of total commercial bank lending, compared to about 50% in the United States. This high degree of concentration is reflected in elevated values of the Herfindahl–Hirschman Index (HHI), a standard measure of market concentration ranging from 0 to 10,000.

Using municipality-level data, we compute the HHI based on banks' shares in local credit markets. Between 2012 and 2016, the distribution of the HHI shifted to the right, indicating an increase in local banking concentration over time. The average municipal HHI rose from 7,151 in 2012 to 7,253 in 2016. Figure B1, appendix B.2, shows the density of the HHI across municipalities in 2012, 2014, and 2016, highlighting both the high level and persistence of concentration in Brazilian local credit markets.

This environment provides a natural setting to study whether an institutional reform that lowers switching frictions—loan portability—can discipline bank pricing even in markets characterized by limited ex ante competition.

5.2 Mechanism Test Consistent with the Competition Channel: Banks' Markups

Loan portability reduces switching costs, making outside options more actionable for borrowers and increasing the elasticity of demand faced by incumbent banks. The mechanism can be summarized as:

$$\text{Lower switching costs} \;\Rightarrow\; \text{stronger outside options} \;\Rightarrow\; \text{incumbents cut interest rates.} \tag{2}$$

Although earlier sections document reductions in interest rates and increases in refinancing activity, this section focuses on how loan portability affects banks' markups.

We proxy banks' markups at the municipality–month level by the difference between the effective loan rate and a maturity-matched funding benchmark derived from the yield curve[6]. This measure captures the spread charged by

[6]The yield curve plots interest rates for bonds of the same credit quality across different maturities. ANBIMA's published curve shows how yields vary from short-term to long-term, reflecting market expectations of future rates and economic conditions.

banks over their marginal cost of funds and is standard in the empirical banking literature.

Formally, the baseline markup measure is defined as:

$$\text{Markup}_{mt} = r_{mt}^{\text{loan}} - \text{YieldCurve}_t, \tag{3}$$

where r_{mpt}^{loan} is the mean effective interest rate on loans (either old, new, or renegotiated loans) in municipality m, and period t, and YieldCurve_t denotes the risk-free yield matched to the loan's maturity.

Because observed spreads may reflect both market power and credit risk, we also construct a default-adjusted (risk-net) markup that explicitly accounts for expected loan losses. Let PD_{mt} denote the default probability over a given horizon, and let $LGD \in [0, 1]$ represent the loss-given-default for payroll loans. The expected net loan return (in "spread units") is:

$$r_{mt}^{DA} = (1 - PD_{mt})\, r_{mt}^{\text{loan}} - PD_{mt} \cdot LGD. \tag{4}$$

Replacing the contractual loan rate with the default-adjusted return yields the risk-net markup:

$$\text{Markup}_{mpt}^{DA} = r_{mpt}^{DA} - \text{YieldCurve}_t. \tag{5}$$

In the empirical implementation, we set $LGD = 1$, corresponding to a conservative "no-recovery" assumption. This choice ensures that our results are not driven by optimistic assumptions about recovery rates and provides a lower bound on effective markups.

5.3 Pass-Through Compression and Exposure to Portability

To test whether loan portability compresses bank markups through a competition channel, we estimate the following specification:

$$y_{m,t} = \gamma_m + \gamma_t + \beta X_{m,t} + \delta\, \text{TREAT}_{m,t} \times \text{POST}_t + \varepsilon_{m,t}, \tag{6}$$

where $y_{m,t}$ denotes the average bank markup in municipality m at time t; γ_m and γ_t are municipality and time fixed effects; and $X_{m,t}$ is a vector of control vari-

ables with time-varying coefficients, including population and GDP per capita.

The indicator $\text{TREAT}_{m,t}$ equals one if municipality m has more than one active bank, capturing exposure to competitive pressure. The variable POST_t is an indicator for the post–loan portability period. The interaction term measures whether markups decline more in municipalities where borrowers have credible outside options following the reform.

5.4 Empirical Evidence

Table 12: Impact of the Loan Portability on Banks' Markup by Municipalities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat x Post	-0.926***	-0.926***	-0.944***	-1.084***	-1.084***	-1.117***	-0.811***	-0.811***	-0.820***
	(0.162)	(0.162)	(0.188)	(0.187)	(0.187)	(0.214)	(0.149)	(0.149)	(0.169)
Constant	18.61***	18.61***	18.64***	18.92***	18.92***	18.99***	18.83***	18.83***	18.87***
	(0.188)	(0.188)	(0.214)	(0.205)	(0.205)	(0.231)	(0.191)	(0.191)	(0.213)
Observations	228,045	228,045	209,923	178,107	178,107	161,051	178,271	178,271	160,231
R-squared	0.754	0.754	0.761	0.733	0.733	0.739	0.718	0.718	0.721
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS			YES			YES			YES

Notes: ***, **, * indicate significance at, respectively, 1%, 5% and 10%. Robust standard errors in parentheses. Standard errors computed clustering by municipality (treatment unit). The table shows the fixed effect estimate of the impact of loan portability on banks' markup. The treatment date is December 2013. The sample range is from January 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6), and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013.

The coefficient of interest, δ, is negative as expected since loan portability increases competition by compressing bank markups. This negative estimate implies that funding shocks pass through less than one-for-one to lending rates once switching costs fall, consistent with textbook markup compression.

Table 12 reports the results. Across specifications, we find a statistically significant and economically meaningful decline in bank markups following the introduction of loan portability. The effect is stronger in municipalities with

lower banking concentration and in those where public banks are present, consistent with heightened competitive pressure.

These findings support a mechanism in which loan portability disciplines incumbent banks not only by enabling realized switching, but also by increasing the credibility of borrowers' outside options. Incumbent banks respond by reducing markups even for borrowers who do not switch lenders, highlighting the importance of the threat of switching as a central driver of competition. For more details, please refer to Appendix G.

6 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 municipalities in country.

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)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-0.199****	**-0.199****	**-0.176****	**-0.287****	**-0.287****	**-0.272****	**-0.105**	**-0.105**	**-0.0718**
	(0.0835)	(0.0835)	(0.0789)	(0.108)	(0.108)	(0.100)	(0.0672)	(0.0672)	(0.0664)
Constant	28.95***	28.95***	28.93***	28.92***	28.92***	28.90***	28.96***	28.96***	28.94***
	(0.144)	(0.144)	(0.150)	(0.145)	(0.145)	(0.151)	(0.127)	(0.127)	(0.132)
Observations	222,486	222,486	205,071	175,582	175,582	159,151	175,509	175,509	158,258
R-squared	0.701	0.701	0.708	0.687	0.687	0.694	0.671	0.671	0.677
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (b): Municipalities with up to four different bank brands								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**-0.158****	**-0.158****	**-0.0301**	**-0.218****	**-0.218****	**-0.0922**	**-0.0881**	**-0.0881**	**0.0452**
	(0.0698)	(0.0698)	(0.0769)	(0.0866)	(0.0866)	(0.0866)	(0.0630)	(0.0630)	(0.0766)
Constant	29.29***	29.29***	29.28***	29.36***	29.36***	29.39***	29.13***	29.13***	29.13***
	(0.146)	(0.146)	(0.152)	(0.129)	(0.129)	(0.125)	(0.169)	(0.169)	(0.177)
Observations	150,608	150,608	127,893	107,291	107,291	85,477	107,170	107,170	85,038
R-squared	0.679	0.679	0.698	0.673	0.673	0.699	0.655	0.655	0.679
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (c): One bank (control) x Two banks (treatment)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	**0.00361**	**0.00361**	**0.131****	**0.0138**	**0.0138**	**0.144****	**-0.0138**	**-0.0138**	**0.110**
	(0.0768)	(0.0768)	(0.0545)	(0.103)	(0.103)	(0.0632)	(0.0911)	(0.0911)	(0.0939)
Constant	28.95***	28.95***	28.84***	28.94***	28.94***	28.79***	28.91***	28.91***	28.81***
	(0.136)	(0.136)	(0.137)	(0.158)	(0.158)	(0.158)	(0.130)	(0.130)	(0.131)
Observations	76,908	76,908	59,537	63,150	63,150	45,984	63,164	63,164	46,695
R-squared	0.689	0.689	0.711	0.679	0.679	0.700	0.680	0.680	0.705
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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.

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[7], in 2014, almost all municipalities had at least one banking hub (such as 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 14 shows the estimates derived from Equation 1. We observe that the results are very similar to the ones in Table 2 and Table 3. Thus, our baseline specification is robust to excluding municipalities that do not have financial services.

[7]Relatório de Inclusão Financeira. (2015). Banco Central do Brasil. Retrieved October 13, 2023, from https://www.bcb.gov.br/content/cidadaniafinanceira/documentos_cidadania/RIF/RIF2015.pdf

Table 14: Excluding Cities Without Financial Services from Control Group and Loan Portability

	Excluding municipalities without financial service point from the control group								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	-0.198**	-0.198**	-0.177**	-0.262**	-0.262**	-0.249**	-0.126*	-0.126*	-0.0949
	(0.0912)	(0.0912)	(0.0833)	(0.121)	(0.121)	(0.108)	(0.0715)	(0.0715)	(0.0678)
Constant	28.95***	28.95***	28.93***	28.91***	28.91***	28.89***	28.99***	28.99***	28.97***
	(0.145)	(0.145)	(0.150)	(0.147)	(0.147)	(0.153)	(0.126)	(0.126)	(0.131)
Observations	224,173	224,173	206,758	174,481	174,481	158,173	174,408	174,408	157,034
R-squared	0.705	0.705	0.712	0.690	0.690	0.698	0.673	0.673	0.679
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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.

We conducted a series of placebo regressions to substantiate the causal relationship underpinning the results in Tables 2 and 3. 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 15, 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 15: Placebo Regressions - I

	Placebo - Treatment date: May 2013								
	Panel (a): interest rates for payroll loans								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	**-0.0270**	**-0.0270**	**0.0179**	**0.0476**	**0.0476**	**0.0981**	**-0.107**	**-0.107**	**-0.0653**
	(0.0848)	(0.0848)	(0.0785)	(0.117)	(0.117)	(0.114)	(0.0688)	(0.0688)	(0.0619)
Constant	29.20***	29.20***	29.19***	29.18***	29.18***	29.18***	29.25***	29.25***	29.27***
	(0.135)	(0.135)	(0.134)	(0.135)	(0.135)	(0.134)	(0.137)	(0.137)	(0.133)
Observations	294,866	294,866	272,147	230,627	230,627	209,339	230,533	230,533	207,867
R-squared	0.644	0.644	0.649	0.631	0.631	0.637	0.616	0.616	0.620
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (b): payroll loans per capita (in ln)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus			
Treat (Dec 2013) × Post	**-0.0518****	**-0.0518****	**-0.0563****	**-0.0673****	**-0.0673****	**-0.0734****	**-0.0345****	**-0.0345****	**-0.0375****
	(0.0201)	(0.0201)	(0.0242)	(0.0264)	(0.0264)	(0.0316)	(0.0144)	(0.0144)	(0.0174)
Constant	4.051***	4.051***	4.039***	4.039***	4.039***	4.023***	3.956***	3.956***	3.929***
	(0.0709)	(0.0709)	(0.0681)	(0.0718)	(0.0718)	(0.0699)	(0.0704)	(0.0704)	(0.0674)
Observations	294,866	294,866	272,147	230,627	230,627	209,339	230,533	230,533	207,867
R-squared	0.920	0.920	0.922	0.917	0.917	0.918	0.910	0.910	0.911
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	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 from January 2013 to May 2016. 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), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013.

As described in Section B, portability does not include overdrafts and revolving credit. Thus, some institutions suggest expanding it to overdraft loans[8], revolving credit cards, and credit card balances.[9]. Table B1 shows the trans-

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

[9]Portabilidade de crédito é pouco conhecida e considerada burocrática

ferred loans via portability by type between 2014 and 2016 (in R$ million and the participation in percent). As described in section B, 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 16.

Table 16: Placebo Regressions - Overdraft Loans Interest Rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) × Post	19.15***	19.15***	21.50***	27.09***	27.09***	29.68***	13.22***	13.22***	15.57***
	(4.182)	(4.182)	(4.340)	(6.180)	(6.180)	(6.107)	(2.567)	(2.567)	(2.951)
Constant	66.31***	66.31***	64.27***	63.95***	63.95***	60.50***	86.84***	86.84***	88.58***
	(11.30)	(11.30)	(11.49)	(12.02)	(12.02)	(12.44)	(8.104)	(8.104)	(7.353)
Observations	199,410	199,410	183,466	151,128	151,128	136,266	151,253	151,253	135,350
R-squared	0.606	0.606	0.619	0.602	0.602	0.619	0.563	0.563	0.575
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013.

As shown in Table 16, interest rates for overdraft loans increased in the treated municipalities (cities with more than one different bank brand) compared 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

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.

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.

7 Conclusion

This paper studies whether reducing borrower switching costs intensifies competition in consumer credit markets. We exploit the introduction of a nationwide loan portability framework in Brazil to identify the causal effects of lowering refinancing frictions on prices and quantities in local credit markets.

Using an event-study difference-in-differences design across municipalities, we show that loan portability led to a statistically and economically significant decline in borrowing costs. Effective annualized interest rates on payroll loans fell by an average of 0.187 percentage points relative to the pre-reform mean, with larger declines of approximately 0.250 percentage points in municipalities that were ex ante less concentrated. At the same time, credit volumes increased: payroll-loan credit per capita rose by 5.6% overall and by 6.75–9.83% in more competitive markets. The joint price–quantity response indicates that the reform operated primarily through increased competitive pressure rather than changes in borrower demand alone.

The heterogeneity of the effects further supports a switching-cost mechanism. Interest rate reductions are larger for borrower segments with greater exposure to portability, such as civil servants and middle-income borrowers, and are amplified in markets where alternative lenders are more readily available. These patterns are consistent with a contestability framework in which lower switching costs strengthen borrowers' outside options, increasing the elasticity of demand faced by incumbent banks and compressing markups even in highly concentrated markets.

Our findings have broader implications for the design of credit market regulation. They suggest that policies targeting switching frictions can meaningfully improve borrower terms and expand credit without requiring entry or changes

in physical banking networks. At the same time, the uneven distribution of benefits across borrower groups highlights that reductions in switching costs alone may not eliminate disparities in access to favorable credit terms.

Finally, the results speak to ongoing policy debates on credit portability and open banking reforms. By showing that lowering switching costs can discipline incumbent pricing and affect market outcomes even in concentrated banking systems, the paper underscores the role of market-design interventions in shaping competition and household financial outcomes.

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Appendix

A 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 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)).

B 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.

B.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.

B.2 Banking Markets

Our analysis spans from January 2013 to May 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)[10]. There are 5,568 unique municipalities in our sample. In 2013, most cities exhibited a single bank branch (22.2%) or no branch at all (34.1%).[11] [12] 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.[13]

B.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 B1 displays the empirical density of the Herfindahl-Hirschman index (HHI)[14] by municipalities for the years 2012, 2014, and 2016. Between 2012 and

[10]We also use a municipality as our standard definition for a local banking market since it is more granular than a micro-region. In 2013, there were 5,572 municipalities compared to 558 micro-region (Figure F10)

[11]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.

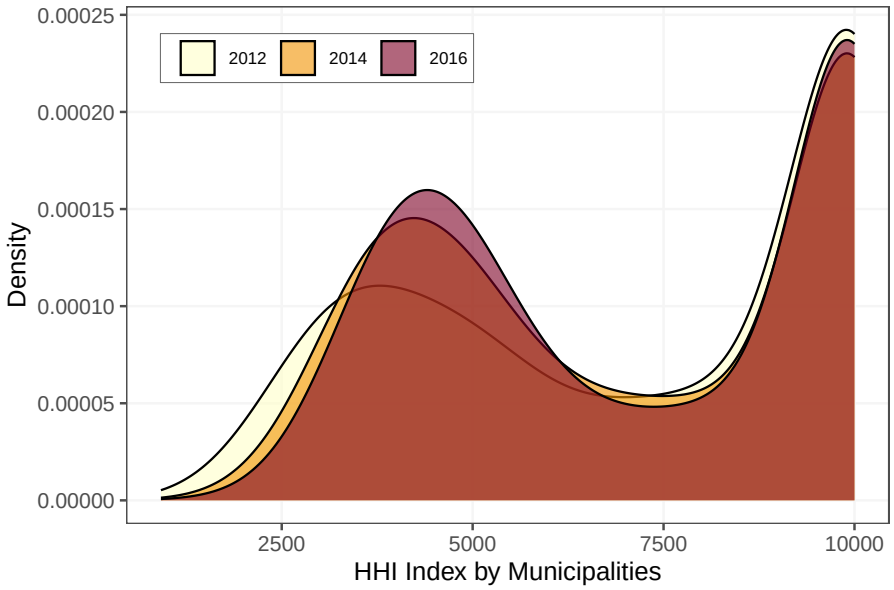
[12]The Central Bank defines a banking correspondent as "a company hired by financial institutions and other institutions authorized by the Central Bank to provide customer service services to customers and users of these institutions." That is a non-banking company (legal entity) responsible for mediating 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.

[13]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.

[14]The Herfindahl-Hirschman index (HHI) is a measure of market concentration. It is com-

2016, the density of the HHI shifted to the right, suggesting increased concentration during this period. On average, the HHI index rose from 7,151 in 2012 to 7,253 in 2016.

Figure B1: 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.

B.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.[15] This new resolution marked a pivotal evolution from the prior attempt in 2006 (Resolution No. 3,402 on September 6, 2006), which had

puted 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.

[15] 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.

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 financial 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[16].

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 B1 and Figure F9, in the

[16]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.

appendix F, 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 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 B1: Transferred Loans via Portability by Type of Credit

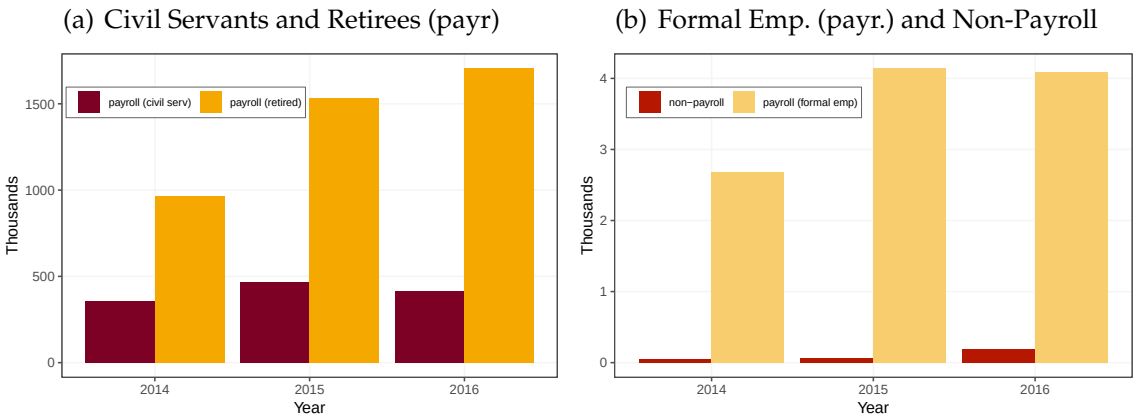
	R$ million			**Participation (%)**		
Loan type	**2014**	**2015**	**2016**	**2014**	**2015**	**2016**
Total	2,369.3	5,948.5	7,679.7	100	100	100
Payroll	2,258.4	5,876.6	7,666.8	95.3	98.8	99.8
Personal	0.62	0.30	0.44	0.02	0.005	0.006
Housing (regulated)	30.4	23.1	5.0	1.28	0.39	0.06
Housing	76.3	45.8	4.2	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 B2 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.[17]

[17] 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 B2: Quantity of Loans Transferred via Portability: Payroll vs. 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.[18] 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 F8, in Appendix F, Brazil experienced a monetary policy tightening at this time.

B.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.

[18]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`

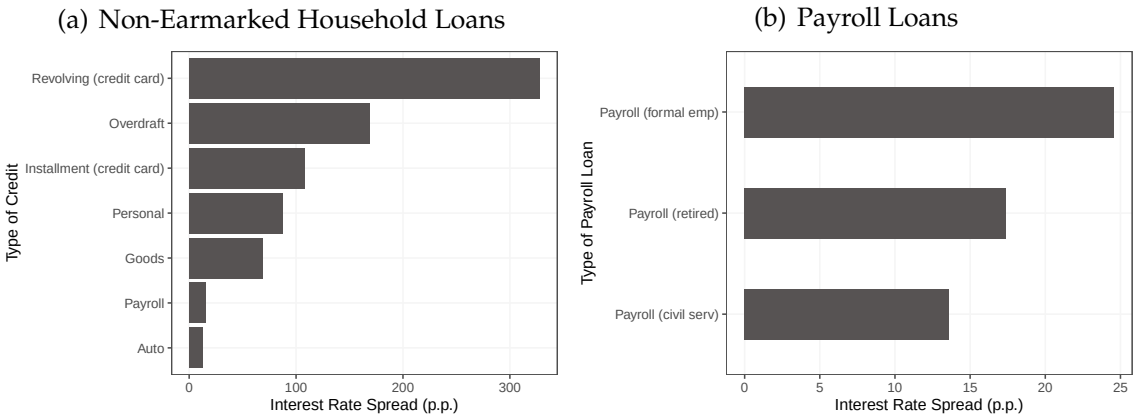
Table B2: Summary Statistics on Payroll Loans

	N	mean	sd	p10	p50	p90
Payroll loan per capita	228062	77.29	61.38	8.19	73.51	157.37
Rate (payroll)	228062	28.38	1.54	26.54	28.33	30.35
Maturity (payroll)	228062	1826.49	121.48	1693.04	1812.09	1983.27

Notes: The sample range is January 2013 to May 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 B2 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 B3 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 B3: 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[19]. 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

[19]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 B3, 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[20]. 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 B3: 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.

[20]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

B.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 B.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.

C Personal Loans

C.1 Personal Loans by Income

Table C4: Income and Loan Portability - Personal Loans

	Panel (a): Low Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	-1.683	-1.683	-1.151	0.432	0.432	0.848	-3.763**	-3.763**	-2.993
	(1.641)	(1.641)	(2.131)	(2.358)	(2.358)	(2.797)	(1.667)	(1.667)	(1.996)
Constant	61.33***	61.33***	58.20***	62.90***	62.90***	58.54***	59.35***	59.35***	54.77***
	(5.909)	(5.909)	(5.880)	(6.262)	(6.262)	(6.276)	(6.992)	(6.992)	(7.142)
Observations	201,712	201,712	186,145	152,577	152,577	138,007	152,697	152,697	137,171
R-squared	0.525	0.525	0.520	0.545	0.545	0.541	0.501	0.501	0.489
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (b): Middle Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	-3.247	-3.247	-4.075	-4.032*	-4.032*	-4.826*	-2.145	-2.145	-3.117
	(2.074)	(2.074)	(2.470)	(2.138)	(2.138)	(2.588)	(2.613)	(2.613)	(2.797)
Constant	59.39***	59.39***	54.85***	52.36***	52.36***	44.13***	54.19***	54.19***	47.12***
	(4.471)	(4.471)	(3.911)	(5.076)	(5.076)	(4.271)	(5.113)	(5.113)	(4.133)
Observations	170,052	170,052	157,636	122,267	122,267	110,901	122,413	122,413	110,011
R-squared	0.543	0.543	0.533	0.551	0.551	0.543	0.544	0.544	0.532
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	NO	YES
	Panel (c): High Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	0.432	0.432	0.472	-0.436	-0.436	-0.418	1.764	1.764	1.874
	(1.158)	(1.158)	(1.230)	(1.706)	(1.706)	(1.724)	(1.855)	(1.855)	(1.971)
Constant	42.18***	42.18***	42.51***	55.03***	55.03***	55.83***	54.44***	54.44***	55.98***
	(7.078)	(7.078)	(7.339)	(9.333)	(9.333)	(10.17)	(10.38)	(10.38)	(11.15)
Observations	131,611	131,611	123,162	89,108	89,108	81,521	89,121	89,121	80,713
R-squared	0.441	0.441	0.436	0.458	0.458	0.451	0.422	0.422	0.415
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS	NO	NO	YES	NO	NO	YES	NO	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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. This is a sample of XXXX individuals who had a personal loan during this period from SCR. From this sample, we selected those individuals that have a flag indicat-

Table C5: Non-Available Income and Loan Portability - Personal Loans

	Non-Available Income								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat × Post	4.858**	4.858**	6.001**	8.420***	8.420***	9.792***	1.411	1.411	2.318
	(2.203)	(2.203)	(2.282)	(2.739)	(2.739)	(2.795)	(1.998)	(1.998)	(2.064)
Constant	87.85***	87.85***	86.06***	90.07***	90.07***	87.87***	86.44***	86.44***	84.31***
	(4.434)	(4.434)	(4.578)	(4.896)	(4.896)	(5.219)	(4.315)	(4.315)	(4.449)
Observations	225,944	225,944	207,926	176,006	176,006	159,054	176,170	176,170	158,234
R-squared	0.497	0.497	0.508	0.495	0.495	0.506	0.476	0.476	0.484
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS			YES			YES			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 2013 to May 2016. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. This is a sample of XXX individuals who had a payroll loan during this period from SCR. From this sample, we selected those individuals who have a flag indicating they have non-available income information.

D Data

D.1 Summary Statistics

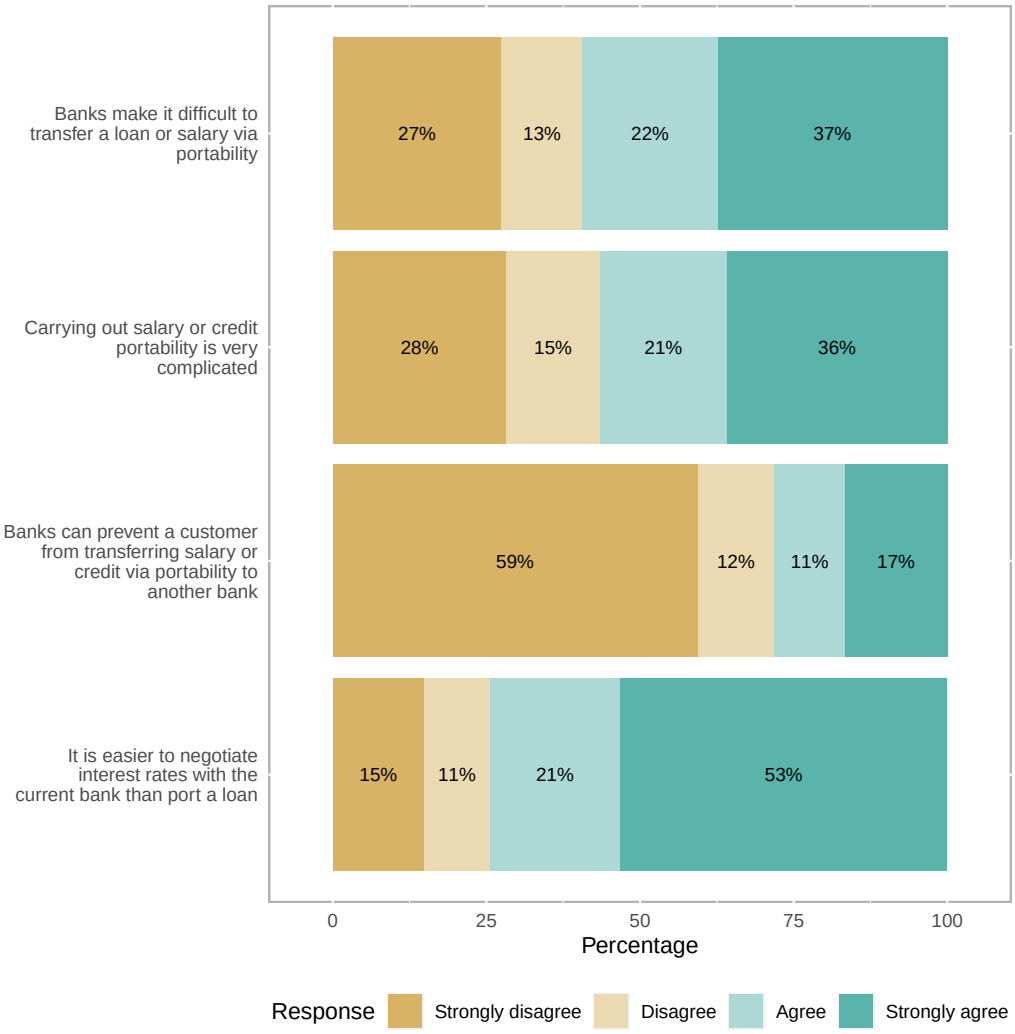
Table D6: Payroll Loans

	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.

D.2 Datafolha Survey on Portability

Figure D4: 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.

E Tables

E.1 Interest Rates - sub-sample: excluding individuals that does not have information about occupation

Table E7: Loan Portability and Interest Rates - sub-sample: excluding NAs in Occupation

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-1.119***	-0.914***	-1.395***	-1.217***	-0.846***	-0.629**
	(0.197)	(0.211)	(0.213)	(0.235)	(0.253)	(0.264)
Constant	29.71***	29.12***	29.62***	29.09***	29.54***	29.01***
	(0.0661)	(0.335)	(0.0465)	(0.399)	(0.0551)	(0.391)
Observations	215,372	215,372	165,700	165,700	165,885	165,885
R-squared	0.131	0.144	0.129	0.143	0.113	0.124
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.2 Interest Rates - sub-sample: individuals that does not have information about occupation

Table E8: Loan Portability and Interest Rates - sub-sample: NAs in Occupation

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0542***	0.0542***	0.103***	0.106***	0.00519	0.00400
	(0.0100)	(0.0106)	(0.0114)	(0.0125)	(0.0120)	(0.0124)
Constant	2.148***	2.197***	2.129***	2.167***	2.085***	2.138***
	(0.00322)	(0.0326)	(0.00233)	(0.0394)	(0.00246)	(0.0380)
Observations	227,444	227,444	177,517	177,517	177,670	177,670
R-squared	0.709	0.710	0.706	0.708	0.739	0.740
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.3 Interest Rates - sub-sample: excluding individuals that does not have information about income

Table E9: Loan Portability and Interest Rates - sub-sample: excluding NAs in Income

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	-1.119***	-0.914***	-1.395***	-1.217***	-0.846***	-0.629**
	(0.197)	(0.211)	(0.213)	(0.235)	(0.253)	(0.264)
Constant	29.71***	29.12***	29.62***	29.09***	29.54***	29.01***
	(0.0661)	(0.335)	(0.0465)	(0.399)	(0.0551)	(0.391)
Observations	215,372	215,372	165,700	165,700	165,885	165,885
R-squared	0.131	0.144	0.129	0.143	0.113	0.124
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.4 Interest Rates - sub-sample: individuals that does not have information about income

Table E10: Loan Portability and Interest Rates - sub-sample: NAs in Occupation

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.201***	0.0822	0.314***	0.159***	0.0870	0.0120
	(0.0571)	(0.0561)	(0.0603)	(0.0593)	(0.0656)	(0.0650)
Constant	27.96***	28.39***	27.94***	28.41***	28.10***	28.48***
	(0.0183)	(0.153)	(0.0124)	(0.186)	(0.0134)	(0.177)
Observations	227,444	227,444	177,517	177,517	177,670	177,670
R-squared	0.600	0.603	0.589	0.592	0.594	0.597
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.5 Volume of Credit per Capita

Table E11: 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 E12: Government-Owned Banks and Loan Portability - II

	Panel (a): Banco do Brasil								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013)x Post	-0.0348	-0.0348	-0.0348	-0.0179	-0.0179	-0.0179	-0.0522	-0.0215	-0.0215
	(0.0358)	(0.0358)	(0.0358)	(0.0448)	(0.0448)	(0.0448)	(0.0342)	(0.0241)	(0.0241)
Constant	4.172***	4.172***	4.172***	4.240***	4.240***	4.240***	4.086***	3.880***	3.880***
	(0.0727)	(0.0727)	(0.0727)	(0.0698)	(0.0698)	(0.0698)	(0.0626)	(0.0112)	(0.0112)
Observations	124,206	124,206	124,206	76,024	76,024	76,024	75,999	75,999	75,999
R-squared	0.945	0.945	0.945	0.950	0.950	0.950	0.939	0.929	0.929
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	NO	YES
PUBLIC BANKS			YES			YES			
	Panel (b): Government-Owned Bank								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	All	All	All	HHI −	HHI −	HHI −	HHI +	HHI +	HHI +
Treat (Dec 2013) x Post	0.0223	0.0223	0.0223	0.0410	0.0410	0.0410	0.00733	0.00733	0.00733
	(0.0389)	(0.0389)	(0.0389)	(0.0487)	(0.0487)	(0.0487)	(0.0325)	(0.0325)	(0.0325)
Constant	4.096***	4.096***	4.096***	4.133***	4.133***	4.133***	4.003***	4.003***	4.003***
	(0.100)	(0.100)	(0.100)	(0.102)	(0.102)	(0.102)	(0.0953)	(0.0953)	(0.0953)
Observations	131,451	131,451	131,451	82,333	82,333	82,333	82,260	82,260	82,260
R-squared	0.939	0.939	0.939	0.939	0.939	0.939	0.929	0.929	0.929
Mun FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	YES	NO	YES	YES	NO	YES	YES
PUBLIC BANKS			YES			YES			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. We include all municipalities. The controls used in columns (2), (5), and (8) are latitude and longitude interacted with time-varying coefficients, population in 2012 above median interacted with time-varying coefficients, and GDP per capita in 2011 above median interacted with time-varying coefficients. In columns (3), (6) and (9), we use the same controls used in columns (2), (5), (8); also, we have a subsample of municipalities that have at least one public bank in December 2013 or no bank in December 2013. 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 E13: Retirees and Loan Portability - II

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.142***	0.104***	0.205***	0.161***	0.0800***	0.0574***
	(0.0144)	(0.0148)	(0.0157)	(0.0170)	(0.0184)	(0.0184)
Constant	-0.405***	-0.535***	-0.375***	-0.434***	-0.382***	-0.526***
	(0.00513)	(0.0615)	(0.00371)	(0.0722)	(0.00429)	(0.0725)
Observations	198,172	198,172	149,795	149,795	149,949	149,949
R-squared	0.675	0.678	0.654	0.657	0.663	0.666
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 E14: 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 (Dec 2013) x Post	0.312***	0.322***	0.415***	0.446***	0.213***	0.215***
	(0.0406)	(0.0400)	(0.0470)	(0.0465)	(0.0452)	(0.0447)
Constant	-1.001***	-1.235***	-0.932***	-1.279***	-0.693***	-0.959***
	(0.0212)	(0.146)	(0.0192)	(0.187)	(0.0183)	(0.180)
Observations	72,525	72,525	46,466	46,466	46,585	46,585
R-squared	0.747	0.748	0.763	0.765	0.727	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): Federal Civil Servant					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.195***	0.220***	0.242***	0.303***	0.154**	0.176**
	(0.0725)	(0.0728)	(0.0783)	(0.0818)	(0.0777)	(0.0772)
Constant	-1.636***	-2.006***	-1.596***	-2.072***	-1.393***	-1.802***
	(0.0448)	(0.210)	(0.0422)	(0.297)	(0.0417)	(0.252)
Observations	34,005	34,005	19,521	19,521	19,547	19,547
R-squared	0.643	0.645	0.680	0.682	0.619	0.621
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 E15: 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 (Dec 2013) x Post	0.308***	0.335***	0.393***	0.430***	0.221***	0.251***
	(0.0563)	(0.0551)	(0.0636)	(0.0625)	(0.0626)	(0.0614)
Constant	-1.469***	-1.813***	-1.460***	-1.956***	-1.076***	-1.417***
	(0.0312)	(0.208)	(0.0287)	(0.275)	(0.0279)	(0.257)
Observations	45,908	45,908	28,353	28,353	28,370	28,370
R-squared	0.730	0.731	0.759	0.760	0.683	0.685
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	0.224***	0.158***	0.288***	0.205***	0.162***	0.125***
	(0.0172)	(0.0172)	(0.0191)	(0.0195)	(0.0214)	(0.0211)
Constant	-0.563***	-0.474***	-0.516***	-0.361***	-0.573***	-0.516***
	(0.00643)	(0.0720)	(0.00482)	(0.0864)	(0.00540)	(0.0856)
Observations	186,744	186,744	138,681	138,681	138,834	138,834
R-squared	0.669	0.674	0.655	0.660	0.651	0.654
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 E16: 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 (Dec 2013) x Post	0.278***	0.277***	0.383***	0.379***	0.175***	0.180***
	(0.0600)	(0.0598)	(0.0657)	(0.0654)	(0.0645)	(0.0638)
Constant	-2.000***	-2.083***	-1.957***	-1.840***	-1.692***	-1.887***
	(0.0361)	(0.233)	(0.0340)	(0.317)	(0.0329)	(0.286)
Observations	48,853	48,853	28,543	28,543	28,556	28,556
R-squared	0.690	0.691	0.719	0.721	0.686	0.687
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 E17: 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 (Dec 2013) x Post	0.158***	0.110***	0.206***	0.151***	0.111***	0.0795***
	(0.0130)	(0.0131)	(0.0139)	(0.0148)	(0.0167)	(0.0163)
Constant	-0.00653	-0.0979*	0.0121***	-0.0648	0.0207***	-0.0980
	(0.00444)	(0.0519)	(0.00311)	(0.0626)	(0.00372)	(0.0618)
Observations	210,618	210,618	161,199	161,199	161,388	161,388
R-squared	0.703	0.709	0.689	0.694	0.691	0.696
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 (Dec 2013) x Post	0.243***	0.212***	0.335***	0.282***	0.153***	0.148***
	(0.0278)	(0.0276)	(0.0304)	(0.0300)	(0.0328)	(0.0328)
Constant	-1.000***	-1.091***	-0.863***	-0.995***	-0.999***	-1.191***
	(0.0133)	(0.118)	(0.0109)	(0.148)	(0.0117)	(0.146)
Observations	118,006	118,006	79,104	79,104	79,215	79,215
R-squared	0.709	0.710	0.700	0.703	0.696	0.697
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 (Dec 2013) x Post	0.317***	0.314***	0.423***	0.415***	0.217***	0.223***
	(0.0420)	(0.0418)	(0.0490)	(0.0482)	(0.0476)	(0.0473)
Constant	-1.199***	-1.340***	-1.101***	-1.359***	-1.010***	-1.140***
	(0.0230)	(0.166)	(0.0216)	(0.228)	(0.0208)	(0.199)
Observations	68,215	68,215	42,463	42,463	42,560	42,560
R-squared	0.719	0.721	0.731	0.734	0.715	0.716
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 E18: 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 E19: 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 E20: 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.

E.6 Volume of Credit per Capita - sub-sample: excluding individuals that do not have information about occupation

Table E21: Loan Portability and Volume - sub-sample: excluding NAs in Occupation

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.210***	0.140***	0.268***	0.187***	0.152***	0.106***
	(0.0148)	(0.0147)	(0.0167)	(0.0170)	(0.0190)	(0.0183)
Constant	0.320***	0.304***	0.334***	0.304***	0.281***	0.210***
	(0.00499)	(0.0511)	(0.00364)	(0.0620)	(0.00414)	(0.0605)
Observations	215,372	215,372	165,700	165,700	165,885	165,885
R-squared	0.726	0.736	0.716	0.725	0.710	0.718
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.7 Volume of Credit per Capita - sub-sample: individuals that do not have information about occupation

Table E22: Loan Portability and Volume - sub-sample: NAs in Occupation

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0542***	0.0542***	0.103***	0.106***	0.00519	0.00400
	(0.0100)	(0.0106)	(0.0114)	(0.0125)	(0.0120)	(0.0124)
Constant	2.148***	2.197***	2.129***	2.167***	2.085***	2.138***
	(0.00322)	(0.0326)	(0.00233)	(0.0394)	(0.00246)	(0.0380)
Observations	227,444	227,444	177,517	177,517	177,670	177,670
R-squared	0.709	0.710	0.706	0.708	0.739	0.740
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.8 Volume of Credit per Capita - sub-sample: excluding individuals that do not have information about income

Table E23: Loan Portability and Volume - sub-sample: excluding NAs in Income

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.210***	0.140***	0.268***	0.187***	0.152***	0.106***
	(0.0148)	(0.0147)	(0.0167)	(0.0170)	(0.0190)	(0.0183)
Constant	0.320***	0.304***	0.334***	0.304***	0.281***	0.210***
	(0.00499)	(0.0511)	(0.00364)	(0.0620)	(0.00414)	(0.0605)
Observations	215,372	215,372	165,700	165,700	165,885	165,885
R-squared	0.726	0.736	0.716	0.725	0.710	0.718
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.9 Volume of Credit per Capita - sub-sample: individuals that do not have information about income

Table E24: Loan Portability and Volume - sub-sample: NAs in Occupation

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All	All	HHI minus	HHI minus	HHI plus	HHI plus
Treat (Dec 2013) x Post	0.0542***	0.0542***	0.103***	0.106***	0.00519	0.00400
	(0.0100)	(0.0106)	(0.0114)	(0.0125)	(0.0120)	(0.0124)
Constant	2.148***	2.197***	2.129***	2.167***	2.085***	2.138***
	(0.00322)	(0.0326)	(0.00233)	(0.0394)	(0.00246)	(0.0380)
Observations	227,444	227,444	177,517	177,517	177,670	177,670
R-squared	0.709	0.710	0.706	0.708	0.739	0.740
Mun FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
CONTROLS	NO	YES	NO	YES	NO	YES

E.10 Non-Earmarked Loans

E.11 Interest Rates

Table E25: 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 E26: 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.

E.12 Volume of Credit per Capita

Table E27: 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.

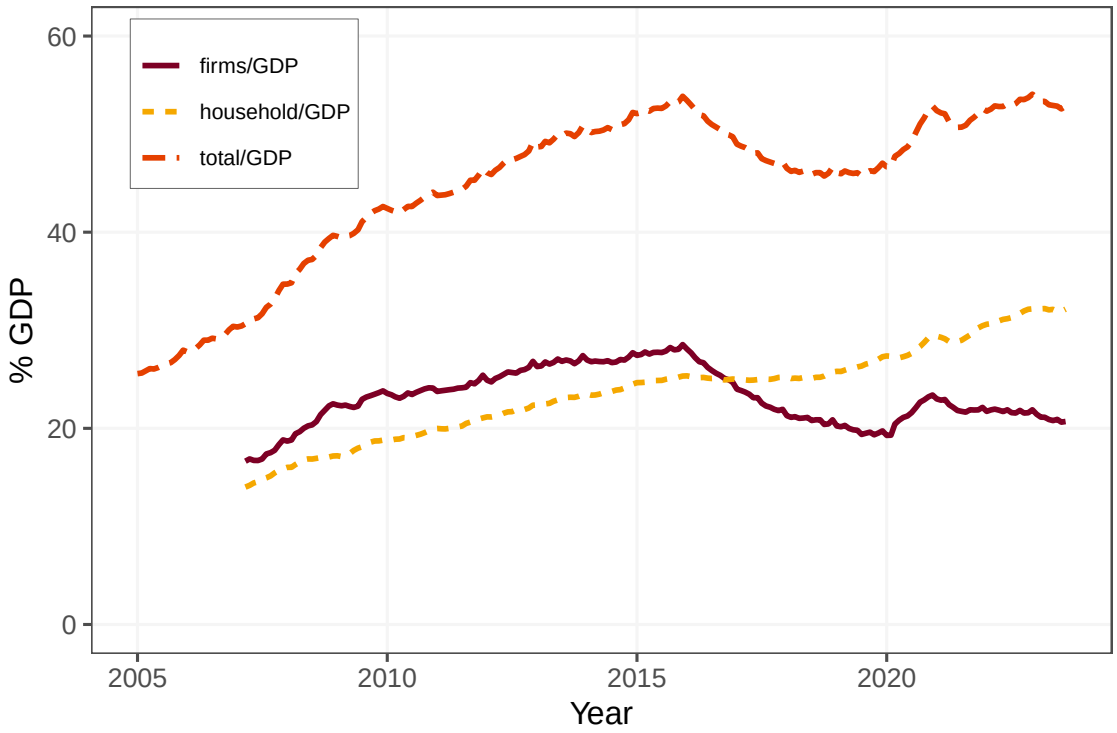
Table E28: Impact of the Loan Portability on Selected Non-Earmarked Loans by Municipalities - IV

	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.

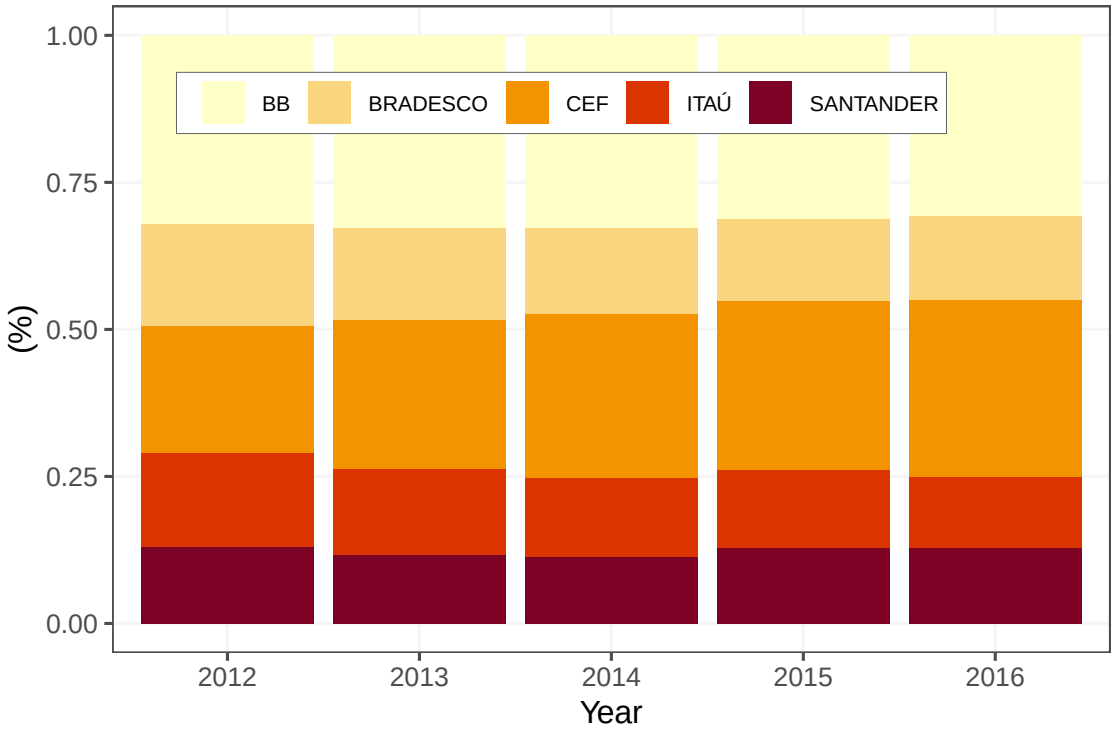
F Figures

Figure F5: Total Credit (as percentage of GDP)



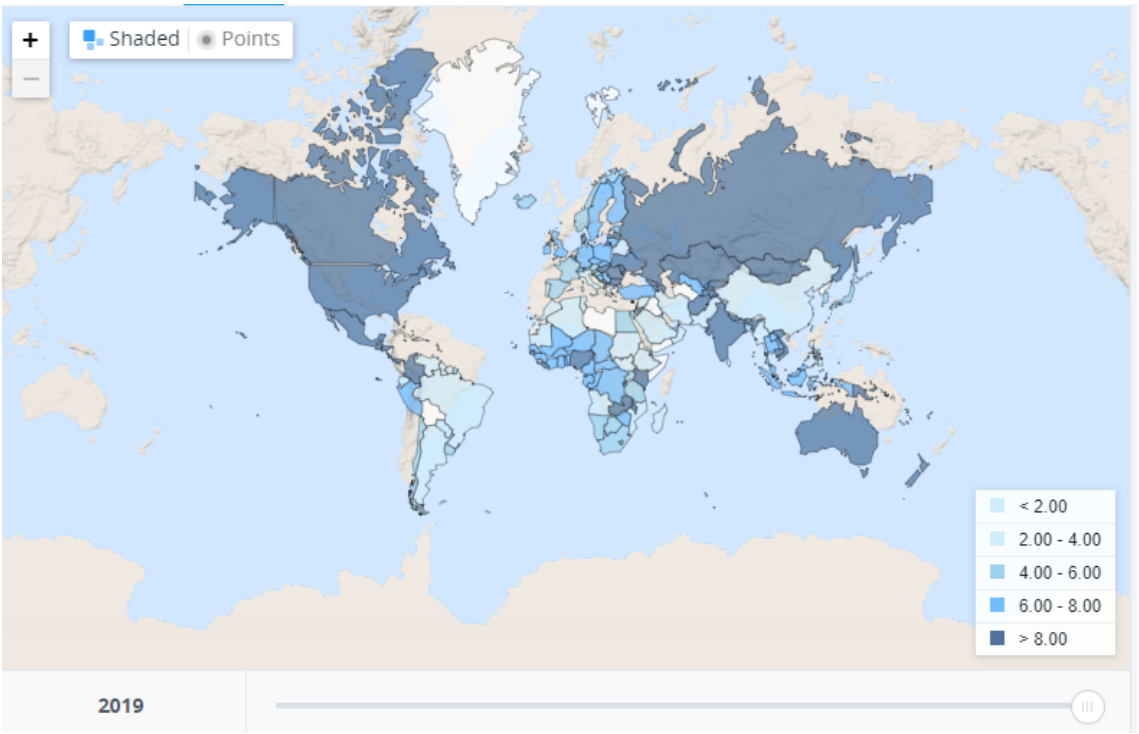
Notes: This figure shows the total credit to GDP, household credit to GDP, and total firms credit to GDP. Authors' calculation using SGS-BCB.

Figure F6: Total New Loans by Banks



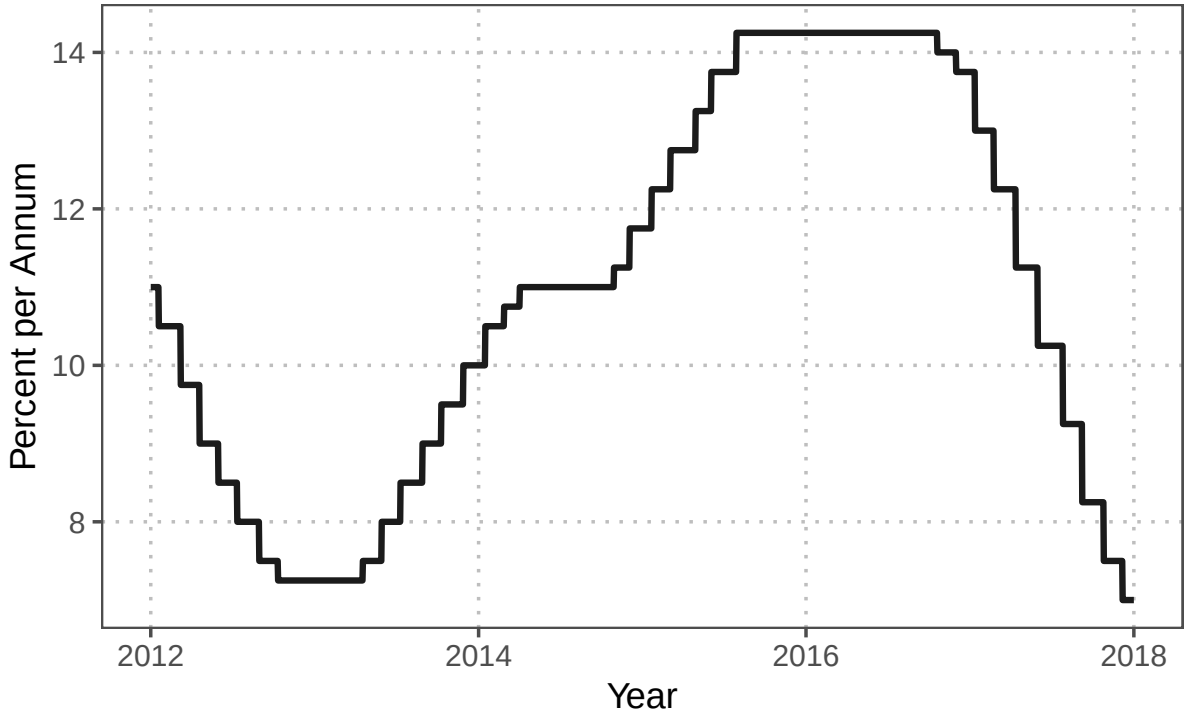
Notes: The figure displays the total new bank loans by banks. Around 80% of the total credit volume extended to firms and households originated from just these five banks in the country. Authors' calculation using Estban-BCB.

Figure F7: Strength of Legal Rights Index



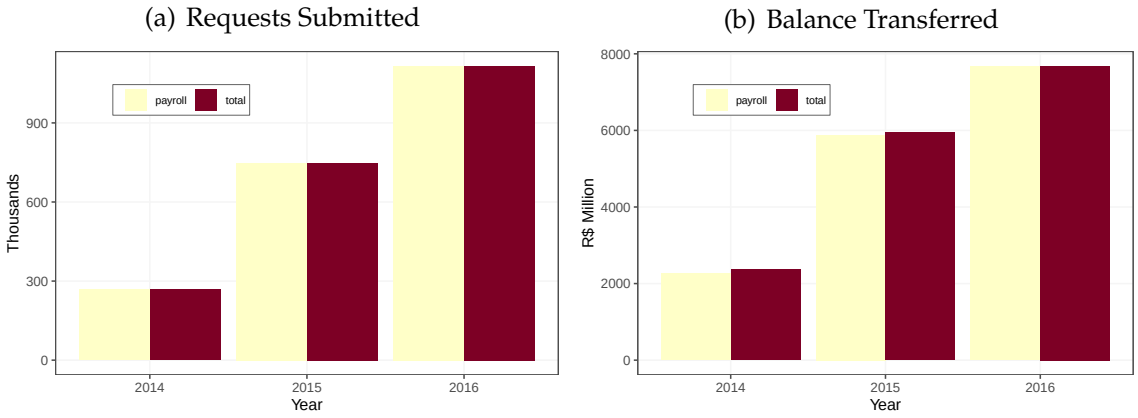
Notes: Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed to expand access to credit. Data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

Figure F8: Selic Interest Rate (BCB)



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

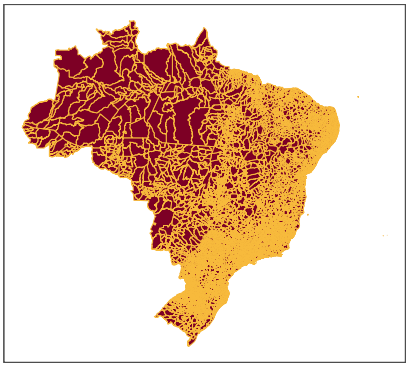
Figure F9: Requests for Credit Portability Submitted; Total Balance Transferred via Portability



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 F10: Municipality vs. Micro-Region

(a) Municipalities in Brazil, 2013



(b) Micro-Regions in Brazil, 2013

Notes: Authors' calculation using IBGE and GeoBr.

G Alternative Interpretations and Robustness of the Markup Measure

This section addresses potential alternative interpretations of the estimated markup compression following the introduction of loan portability.

G.1 Risk Pricing versus Competitive Effects

A first concern is that the decline in loan spreads may reflect changes in borrower risk or banks' screening behavior rather than increased competition. We address this concern in two ways. First, we explicitly adjust loan returns for expected default losses by incorporating default probabilities into the markup measure. The estimated effects remain statistically significant and economically meaningful when using default-adjusted markups, indicating that changes in expected credit risk are unlikely to be the primary driver of the results.

Second, the estimated effects are concentrated in municipalities with greater scope for competition, as measured by the presence of multiple active banks and lower market concentration. If the results were driven by improved borrower quality, one would expect similar effects across municipalities regardless of competitive structure. The observed heterogeneity therefore supports a

competition-based interpretation.

G.2 Loss-Given-Default Assumptions

The default-adjusted markup measure requires an assumption on the loss-given-default parameter. In the baseline analysis, we set $LGD = 1$, corresponding to a conservative no-recovery assumption. This choice ensures that our results are not driven by optimistic recovery assumptions and yields a lower bound on effective markups.

Importantly, the identifying variation in our difference-in-differences design relies on changes over time and across municipalities. Alternative values of $LGD < 1$ would shift the level of the markup but would not affect the estimated treatment effects unless recovery rates changed differentially across treated and control municipalities exactly at the time of the reform. We find no evidence of such differential changes, suggesting that the results are robust to reasonable alternative LGD assumptions.

G.3 Alternative Funding Benchmarks

A related concern is that markup compression may reflect changes in banks' funding costs rather than lending-side competition. To address this issue, we benchmark loan rates against a maturity-matched yield curve that varies over time but is common across municipalities. This approach absorbs aggregate movements in funding conditions, monetary policy, and term premia.

Because the yield curve does not vary cross-sectionally, the estimated effects are identified from differential pricing responses across municipalities with different exposure to loan portability. This design ensures that the results are not mechanically driven by changes in banks' marginal funding costs, but instead reflect changes in pricing behavior consistent with increased competition.