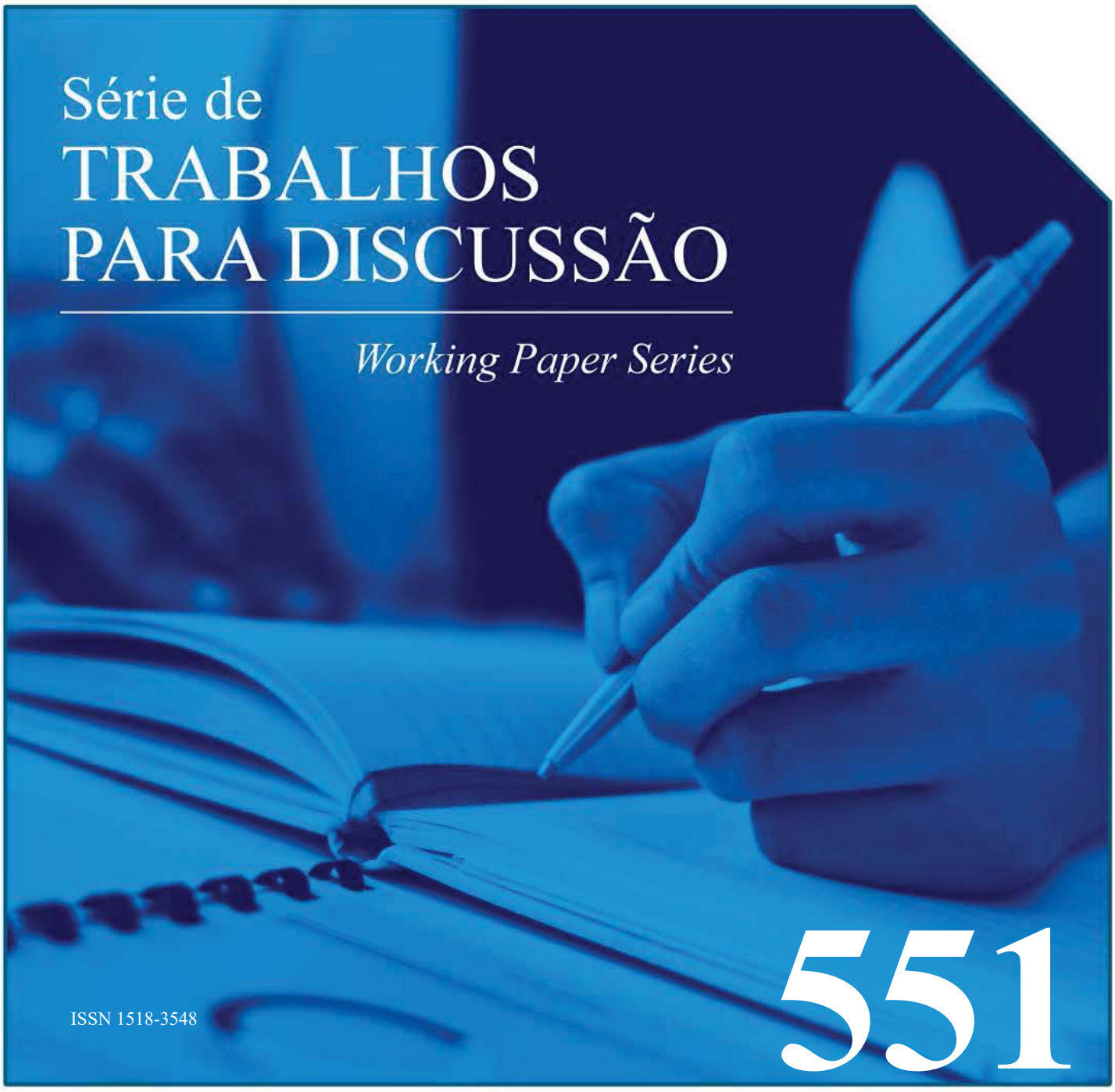

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Is Corporate Credit Risk Propagated to Employees?

Filipe Correia, Gustavo S. Cortes, Thiago C. Silva

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Deati/Diate

SBS – Quadra 3 – Bloco B – Edifício-Sede – 2º subsolo

70074-900 Brasília – DF – Brazil

Toll Free: 0800 9792345

Fax: +55 (61) 3414-2553

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Non-Technical Summary

Labor contracts connect firms and individuals. Firms' access to credit dictates their labor and investment decisions. Shocks to firms' ability to secure funding rapidly become changes in their workers' labor outcomes. In their consumer capacity, these workers make use of credit instruments to smooth consumption over time. Hence, consumers need to generate income that allows them to repay this contracted credit. The most predominant source of income of consumers across the world is through their ability to work. Thus, employer credit shocks are likely to affect employee credit. The relevance of the study of credit risk propagation is twofold: (i) the micro angle that bank retail and corporate portfolios are regarded as separate and the existence of an intra-bank correlation between them, created by labor relatioships; and (ii) the macro angle of the stability of financial system as a whole and how risks might propagate inter-bank, in case employment links are not considered in risk management policy.

Using a labor contract registry, a household credit registry, and information on credit ratings of publicly-listed firms, we show that credit risk propagates from firms to their workers. When a company is downgraded, their employees become more likely to default on their loans, when compared to their peers that work in other non-downgraded firms. Subsequently, we find that these workers obtain 20% less credit at 10% higher interest rates. On the real effects side, they cut consumption by 5 to 10%. The main contribution of this work is to establish employer credit risk as a source of risk of household credit, documenting the bank loan term response to shocks in this source of risk and its effects in the real economy.

Sumário Não-Técnico

O contrato de trabalho liga empresas e trabalhadores. A capacidade de as empresas obterem crédito dita as suas decisões de investimento e de emprego. Choques na capacidade de obtenção de crédito por parte das empresas, tornam-se rapidamente mudanças nas condições de emprego dos seus trabalhadores. Na sua função de consumidor, estes trabalhadores utilizam instrumentos de crédito para suavizar o consumo ao longo do tempo. Os trabalhadores precisam então gerar rendimentos que lhes permitam repagar o crédito contratado. A fonte de rendimento mais comum dos consumidores em todo o mundo é através da sua capacidade de trabalharem. Assim, impactos no crédito dos empregadores poderão ter efeito no crédito dos empregados. A relevância do estudo dessa propagação de risco de crédito prende-se com duas perspetivas importantes para o setor bancário: (i) a perspetiva micro da separação das carteiras corporativa e de varejo nos bancos, e da existência de uma correlação intra-banco entre elas ditada por contratos de trabalho; e (ii) a perspetiva macro da estabilidade do sistema financeiro como um todo e como os riscos se poderão propagar inter-bancos, se essas ligações não forem consideradas na política de gestão de risco.

Usando registros de relações empregatícias, registros de informação de crédito a pessoas físicas e informação sobre *ratings* de crédito de empresas listadas, mostramos que o risco de crédito se propaga das empresas para os seus trabalhadores. Quando uma empresa é alvo de uma descida do seu *rating* de crédito, os seus empregados passam a ser mais propensos à inadimplência das suas dívidas, quando comparados com os seus pares que trabalham noutras empresas onde não ocorreu qualquer descida de rating. Esses trabalhadores obtêm 20% menos crédito a taxas de juro 10% mais alta. No domínio dos efeitos reais, verifica-se que esses trabalhadores contraem o seu consumo em 5 a 10%. A principal contribuição deste trabalho é estabelecer risco de crédito do empregador como uma das fontes de risco para o crédito de varejo, documentando a resposta dos termos bancários a alterações nessa fonte de risco e os seus efeitos na economia real.

Is Corporate Credit Risk Propagated to Employees?*

Filipe Peças Correia†

University of Georgia

Gustavo Silva Cortes‡

University of Florida

Thiago Christiano Silva§

Banco Central do Brasil & UCB

Abstract

Using an administrative credit registry for individuals merged with matched employer-employee data, we investigate whether a firm's credit risk affects its employees' access to credit. We find that employees of companies that suffer credit rating downgrades have access to 20 percent less credit and face 10 percent higher interest rates compared with similar employees of non-downgraded firms. Workers from downgraded firms are also 5 p.p. more likely to default on loans than employees from unaffected firms. These adverse financial effects have real consequences, with employees cutting consumption by 9 percent following downgrades of their employers. Our results suggest that banks process information on the financial health of employers when pricing consumer credit.

Keywords: credit risk, default risk, employer-employee spillovers.
JEL Classification: G21, G50, G51.

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†Corresponding Author. Terry College of Business, University of Georgia. Email: **filipe.correia@uga.edu**. Website: **sites.google.com/site/filipecorreiauiuc**.

‡Warrington College of Business, University of Florida. Email: **gustavo.cortes@warrington.ufl.edu**. Website: **sites.google.com/site/cortesgustavos**.

§Research Department, Banco Central do Brasil. Universidade Católica de Brasília. Email: **thiago.silva@bcb.gov.br**.

1. Introduction

Employment relationships link firms and consumers, two important types of borrowers to which banks are exposed. Firms' financing constraints affect their employment decisions.[1] In turn, households' employment terms, such as income, tenure, and employment status affect their ability to repay credit, which should affect their access to credit.[2] Hence, it is plausible that employer credit risk puts employee credit at risk as well. An immediate implication of this possible effect is that a rational bank portfolio manager would recognize an employment-driven correlation between corporate and retail portfolios, and react to employer credit shocks by reducing the bank's exposures to the associated employees. A second implication is that the labor market connects firms' and consumers' credit markets, serving as a channel of credit-risk transmission. Thus, credit and labor markets are too intertwined to be regarded in isolation and policymakers should consider such channels to avoid unintended consequences.

In this paper we answer the question whether credit risk is propagated from firms to their employees. We exploit Brazilian administrative data linking banks, firms, and households over the period running from 2013 through 2017 and merge it with credit ratings to show that employer credit risk is a source of consumer credit risk. Credit registry data allow us to estimate how employees' loan terms respond to public information on the deterioration of their employers' creditworthiness.

Our identification strategy exploits credit rating downgrades of publicly listed firms, which act as a public signal of the deterioration of these firms' creditworthiness, increasing their financing constraints.

Using a difference-in-differences (DID) framework, we quantify how an increase in an employer's credit risk affects default rates among employees and the loan terms (e.g. loan amounts, interest rates) they obtain. Bank identifiers make it possible to estimate within-bank effects, which allows us to absorb all bank-specific variation that could contaminate our results. An important advantage in our approach with respect to causal inferences is that corporate downgrades

[1] For evidence of the effects of corporate financial constraints on employment see e.g. Adelino et al. (2017), Almeida et al. (2012), Almeida et al. (2016), Bau and Matray (2020), Chodorow-Reich (2013), Duygan-Bump et al. (2015), Falato and Liang (2016), and Hombert and Matray (2017). Agrawal and Matsa (2013) show evidence that labor market frictions affect firms' financial decisions.

[2] See, for instance, Baugh and Correia (2019), Baugh and Wang (2018), Bernstein (2019), and Donaldson et al. (2019).

are not likely to be affected by employees' credit risk. For example, truck drivers likely have no influence on rating downgrades of their employers, and probably have a similar credit assessment to other truck drivers employed by non-downgraded companies, in the absence of a downgrade.

A remaining concern is the possibility that downgraded companies, which are downgraded for being poorly managed, hire too many workers with characteristics that are inherently correlated with poorer credit outcomes. Fortunately, our rich set of worker-level controls for age, gender, schooling, and employment characteristics ensure that the observed effects are not driven by individual-specific observables. We use bank-year fixed effects to isolate the idiosyncratic deterioration of a firm's credit risk from other factors that simultaneously constrain the banking system and downgraded firms.

Credit rating downgrades represent a significant tightening of firms' credit constraints.[3] We verify that a credit rating downgrade leads consistently to an economically significant reduction of 26 basis points in corporate debt financing in the subsequent year, which has a direct impact on employment and wages. Our work adds the next step of this transmission in the picture by focusing on the consumer credit outcomes for individuals who remain employed at a downgraded firm.

Our research produces three main results. First, we find that employees in firms hit by credit rating downgrades face higher ex-post default risk than their counterparts employed by non-downgraded firms. Employees of downgraded firms are more likely to default on their loans at 1-, 2- and 3-year-ahead horizons. In particular, the 1-year-ahead default rate is 1 to 2 percentage points higher for non-executive personnel in downgraded firms. While point estimates are lower for executive employees, they are not statistically distinguishable from those obtained for non-executives. These effects increase with the horizon, reaching 5 percentage points on the 3-year-ahead default rate for auto loans within the same financial institution, relative to pre-shock means.

Second, we document how banks adjust loan terms offered to workers at downgraded firms, relative to other workers. A company's credit rating downgrade leads to higher interest rates (a 2.5 to 10 percent increase) and lower loan amounts (an 8 to 20 percent decrease) granted

[3]See, for instance, Almeida et al. (2017), Goh and Ederington (1993), Hand et al. (1992), and Tang (2009). Credit downgrades damage banks' ability to access wholesale funding and public debt markets, increasing their cost of funding (see e.g. Adelino and Ferreira (2016)).

to their employees. This is verified not only in our baseline specification, but also when considering within-bank variation. If employees from two firms—one downgraded and the other not—borrow from the same bank, then this bank will offer worse credit terms to employees of the downgraded firm, than to employees of the non-downgraded firm, after the downgrade. We show that these effects occur in a variety of consumer credit markets, such as payroll loans and auto loans, which runs against our findings being specific to certain types of credit.[4] Banks adjust loan terms to the higher risk of employee default stemming from downgrade, resulting in greater financial constraints on households.

Third, we use non-interest-bearing credit card balances—which are used solely as means of payment—to proxy for consumer spending, in an exercise similar to that in Aydin (2019) and Gross et al. (2020). We observe point estimates for spending ranging from a 5 to 9 percent drop in employees' spending when their employer is downgraded.

We augment the usual perspective that firms' financial frictions affect labor market outcomes by adding financial consequences to employees when consuming and borrowing.[5] We examine the consumer finance impact of employer financial constraints, going beyond the labor effects of corporate financial distress. We add another mechanism for propagating credit shocks to employees—household credit risk is affected by firm-specific shocks. This implies that banks' corporate and retail portfolios are correlated not only through systematic, economy-wide risk but also through existing employment relationships.

We contribute to the literature that analyzes unemployment, income, and consumer-worker decisions in credit markets. We do so by collecting an array of data comprising employer ratings, employment characteristics, and employee credit outcomes. This is a marginal increment to studies that analyze the impact of income shocks on consumption and credit (e.g. Baker and Yannelis (2017), Baker et al. (2020), Gelman et al. (2018), and Ganong et al. (2020)). Because we are able to control for each worker's current level of income, our estimates reflect employer-driven future income risk, rather than realized income shocks. Ganong and Noel (2019) provide evidence that unemployed individuals sharply cut consumption when their unemployment benefits

[4]We also document that banks increase loan provisions as a percentage of loan amount to employees from downgraded firms, suggesting an increase in the expected loss given default.

[5]Existing studies show that firms' financial frictions affect their labor demand. See, for instance, Benmelech et al. (2011), Bai et al. (2018), and Caggese et al. (2019)). Barrot et al. (2018) use import competition from firms to examine the household debt response from a macroeconomic perspective.

expire, even though the shock is completely predictable and non-random. On unemployment and credit, Braxton et al. (2020) show that unemployed individuals try to mitigate the resulting loss of income by borrowing. Our data allow us to address the change in unemployment risk, instead of a change in employment status. In our setting, individuals are still employed but they face a higher latent probability of becoming unemployed.

Micro-level empirical evidence pertaining to labor and credit has become available only recently following the advent of high computational power and the resulting detailed datasets that are often proprietary and administrative. Guiso et al. (2005) and Guiso et al. (2013) use Italian administrative data to show that firms work both as implicit insurers and lenders for their employees. Recent work by Di Maggio et al. (2020) uses employer-employee matched data in the US to show that firms provide partial insurance to their workers, but firm-level uncertainty shocks are passed through, resulting in a lower consumption of durable goods among low-income workers. Alfaro and Park (2020) identify employers and employees using online account-aggregator data and measure the impact of firm-level uncertainty on employee spending.[6] Relatedly, Gortmaker et al. (2019) use confidential data from LinkedIn to find that workers in distressed firms also respond to news about their employers' creditworthiness by increasing the number of connections they make through the social network.

We establish employer-related risk as a source of household credit risk, contributing to a better understanding of the underlying risks associated with household balance sheets. Bernstein et al. (2019) compare standard bankruptcy procedures—liquidation versus reorganization—and observe labor market outcomes in the localities (blocks, block groups, and tracts) where such events take place. They find that bankruptcy liquidation reduces employment in apparently unaffected businesses. Graham et al. (2019) find that, following a corporate bankruptcy filing, employee's earnings fall by 10 percent in the same year, with a large cumulative effect over longer time horizons. Both studies document the labor market consequences of firm distress. Our work looks at the household credit consequences of such spillovers, adding to the growing body of literature on household credit outcomes (e.g. Mian et al. (2010), Mian and Sufi (2016), Adelino et al. (2016), Agarwal et al. (2017), and Alpanda and Zubairy (2019)). We add

[6] Fonseca and Van Doornik (2021) use confidential administrative data from Brazil and find that access to credit impacts the skill and experience of hired employees. Cortes et al. (2019) also use data on lending relationships in Brazil to show that credit risk propagates through firm networks.

to this literature evidence regarding how household credit risk, banking terms, and consumer spending change in response to employer-related risk.

The remainder of this paper is structured as follows. In Section 2 we describe the data and provide institutional background on the Brazilian credit and labor markets. In Section 3 we present our empirical strategy. We report our main results in Section 4. In Section 5 we test the robustness of our results. Section 6 concludes.

2. Institutional Background and Data

In the 1980s and 1990s, around 50 percent of bank credit in Brazil was granted by government-owned banks, with a third of bank branches operating under federal government banks, including the largest and oldest bank in Brazil, *Banco do Brasil*. Even after a series of privatizations of most state-level banks that occurred in early 2000s, government banks still own approximately 45 percent of total bank assets in Brazil. Both government-owned and private banks are required to report each loan they grant to the Central Bank of Brazil (BCB)

In 2003, the Brazilian Congress approved a law regulating the legal status of payroll lending. Payroll loans are consumer loans for which the principal and interest payments are deducted directly from a borrower's paycheck. By allowing repayment to be executed through automatic payroll deduction, future income becomes the collateral. Despite the potential resemblance of such loans to payday loans, there are three substantial differences: (i) interest rates are much lower for payroll loans than for payday loans in the US; (ii) a consumer can close a bank account to which payday loan checks are written, which is not possible for payroll loans; and (iii) payday loans involve balloon payments, with high loss given default, while payroll loans are mostly installment loans. A detailed analysis of payroll loans and their effects on credit markets is conducted in Coelho et al. (2012). The ballpark number for the average default rate in Brazil for payroll loans is 5 percent.

Most of the economic activity from listed firms in Brazil takes place in the state of São Paulo, matching what we observe on the number of workers in publicly traded firms per state, as can be seen in Figure 1. Brazil has a relatively well-developed financial market and its stock exchange—formerly *Bovespa*, now B3—included 300 to 400 listed companies in the last decade.

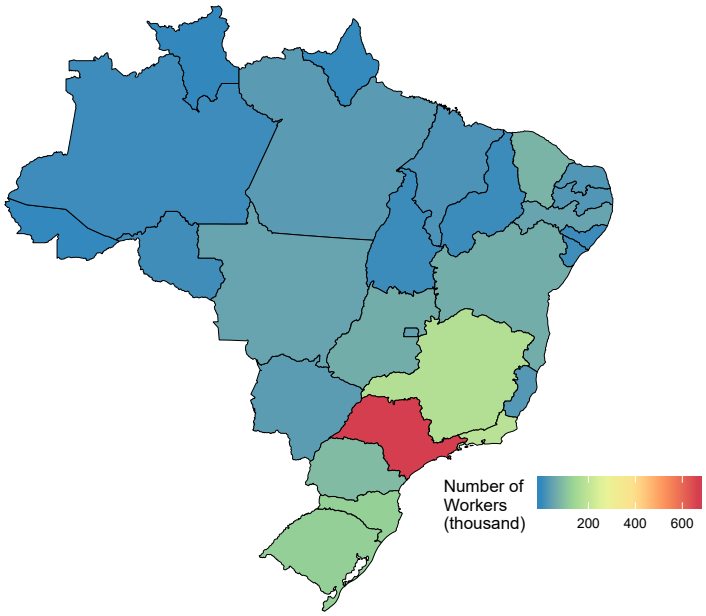

Figure 1. Number of Workers employed in Publicly Traded Companies by State. This figure shows the number of workers employed by publicly-traded firms in Brazil in each state.

According to Bloomberg, as of January 2019 there were eight companies with investment-grade ratings in Brazil. The Brazilian labor market experiences relatively severe frictions because of rigid labor laws, causing labor decisions to be sticky (Dix-Carneiro et al. (2021), Ulyssea and Ponczek (2018)). The last two decades saw a steep rise in household debt in emerging economies (Bahadir and Gumus (2016), Garber et al. (2019), Müller (2018)). In Brazil, for instance, household indebtedness grew from 35 percent to 55 percent of total disposable income between 2009 and 2014, and accounted for up to two-thirds of disposable income in 2018.

We merge the credit registry maintained by the BCB with matched employer-employee data from the Ministry of the Economy. Our sample period is 2013-2017, which is not only the period in which data on individuals are the most reliable, but is also the period with the highest number of workers and industries in listed companies in our database.

Credit registry data are made available by the BCB, from their *Sistema de Informações de Crédito* (SCR). The SCR contains information about the near-universe of loans above 200 BRL between banks and individuals. Each individual is tracked using an encrypted identifier linked to their tax identification number (*CPF, Cadastro de Pessoas Físicas*). High quality information on the loan amount, interest rate, bank provision, loan rating, collateral, and amounts past due

is available for each loan. Moreover, the bank's encrypted tax identifier (*CNPJ, Cadastro Nacional de Pessoas Jurídicas*) is included in each loan. We collect information on all loans above 200 BRL to all individuals working in publicly listed firms. We retain only non-directed credit to avoid confounding effects from subsidization though directed funds. We restrict our sample to auto loans, payroll loans, and credit cards.

Employer-employee data are obtained from *Relação Anual de Informações Sociais* (RAIS). RAIS data are collected through mandatory reporting to the Ministry of the Economy from all the tax-registered firms in Brazil. Every employee who is formally employed in Brazil is represented in this high-quality and high-compliance database. Both employers and employees are identified with the same encryption of tax identifiers described above, allowing the two datasets to be merged. For each employment relationship we observe: employer and employee identifiers, salary, contracted hours, tenure, contract status, and employee demographics including occupation, age, gender, educational attainment, and race. We restrict the database to full-time workers in publicly listed firms.

Using the employee identifier, we merge both datasets, obtaining a loan-year panel, with demographics and labor outcomes of the borrower, loan characteristics and the exact identification of their employer. We collect data on ratings from Bloomberg. We select ratings from the three main agencies (S&P, Moody's and Fitch) and use them as our measure of credit risk. We restrict our attention to employees of publicly listed firms for three main reasons: (i) we want firms to be exposed to credit rating agencies; (ii) information on each firm's fundamentals is public; and (iii) it raises external validity of our study, as publicly listed firms are most similar across developed financial markets. Table 1 presents summary statistics of the dataset in our sample period.

We separate loans by product type and compare loan outcomes and borrower characteristics in the subset of payroll, auto and interest-bearing credit cards. We exclude mortgages, acknowledging the preeminence of subsidized mortgages in Brazil, which invert the normal functioning of credit pricing mechanisms. For example, a lower income individual is more likely to obtain subsidized credit, so we observe higher loan amounts and lower interest rates as income declines when controlling for other observables. As such, we use auto loans as our example of collateralized consumer credit. The average borrower in our sample has a salary of 3,810 BRL and almost six years at the same company. The white population is over-represented and the bor-

Table 1. Summary Statistics by Loan: This table shows loan terms, labor contract information and borrower characteristics for the full sample of loans. Treatment loan-year pairs are those whose borrowers' employers experience credit rating downgrades over the course of the sample period.

	Payroll	Auto	Credit Card
Loan Characteristics			
Loan Amount (BRL)	8,827	16,149	2,999
Interest Rate (p.a.)	29%	22%	76%
Loan Provision (BRL)	72	84	91
Collateral Value (BRL)	0	39,881	0
Loan Rating	8	8	7
Government Bank	77%	89%	78%
Labor Contract			
Salary (BRL)	3,399	4,246	3,647
Tenure (months)	81	71	67
Contracted Hours	42	42	42
Borrower Characteristics			
College Degree	31%	43%	39%
Female	33%	29%	38%
Age	39	37	38
White	60%	64%	57%
Treat Dummy	12%	10%	10%
# of Loans	2,685,445	1,974,375	3,180,319

rower is a woman in only 35 percent of the observations. A large majority of loans are granted by government-owned banks, most of them involving credit cards.

As expected, the highest loan amounts are observed in auto loans and the lowest average amount is observed in credit cards.[7] Only auto loans have collateral, usually the associated vehicle, which explains why the interest rate for these loans is the lowest. Credit cards carry high rates in Brazil, with an average annual percentage rate (APR) of 76 percent. Borrowers' demographics are similar across product types, and all the borrowers are similarly likely to fall into the treatment group. The only sizeable difference is the higher income of workers who finance their vehicle purchases with auto loans.

3. Empirical Strategy

Our goal is to estimate the effects of a firm's credit rating downgrade in its employees' credit risk and loan outcomes. We do so by exploiting a source of variation in employer credit risk that plausibly affects consumer credit risk without being directly affected by it: credit rating

[7] Each credit card loan represents a billing cycle.

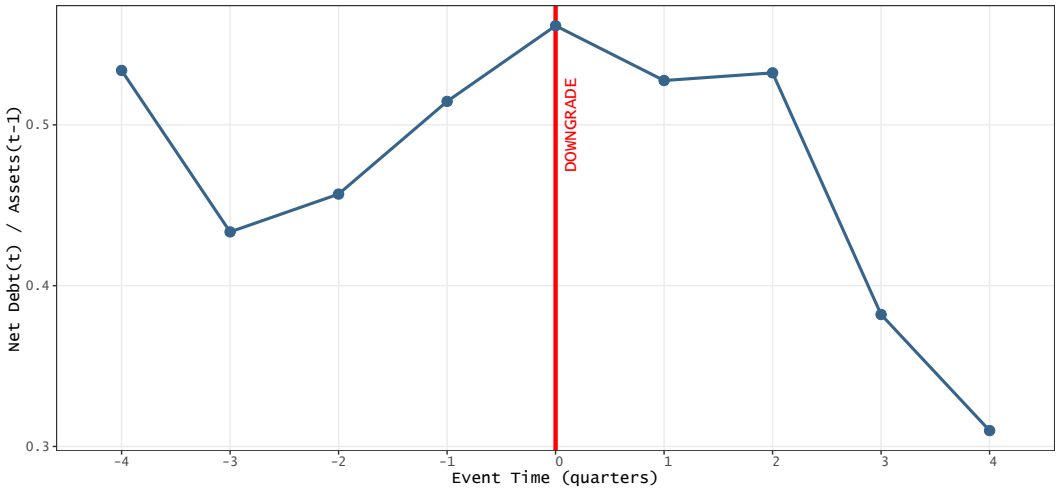

Figure 2. Impact of a Credit Rating Downgrade on Corporate Debt. This figure shows the effects of a credit rating downgrade on corporate debt financing as measured by net debt divided by lagged total assets averaged across all downgraded firms. The time window displays one year before (quarters $t \in \{-4, -3, -2, -1\}$) and one year after (quarters $t \in \{1, 2, 3, 4\}$) the date of the downgrade event ($t = 0$), which is highlighted by the vertical red line. The figure reflects our sample, which consists of all corporate downgrades between 2013:Q3 and 2017:Q2. There are 45 downgrade events, involving a total of 24 unique firms.

downgrades. It could be the case that credit ratings do not bind firms' financial ability to make investment and employment choices. Figure 2 shows that, in the year following a credit rating downgrade, firms decrease their reliance on credit.

The proposed channel through which firm credit risk becomes employee credit risk is unemployment risk. We verify that, after employer credit rating downgrades, workers are more likely to leave firms, consistent with findings reported in the literature that focuses on the employee costs of financial distress (Bernstein et al. (2019), Graham et al. (2019), Baghai et al. (2020)). Figure A1 plots event-study coefficients around downgrades, confirming this intuition.[8]

We use a DID design with multiple downgrade events that can occur in multiple companies at any moment in time. The treatment group is the set of loan-year observations associated with borrowers whose employers were downgraded during our sample period. The baseline control group comprises all loan-year observations corresponding to workers in publicly listed firms that were never downgraded during the entire sample period. We aim to

[8]Graphically, we see what could be a pre-trend in labor outcomes, albeit not one that is statistically significant. It is, however, expected given prior evidence that credit ratings are slow-moving and lag behind firm fundamentals (Löffler (2005); Binici et al. (2018)).

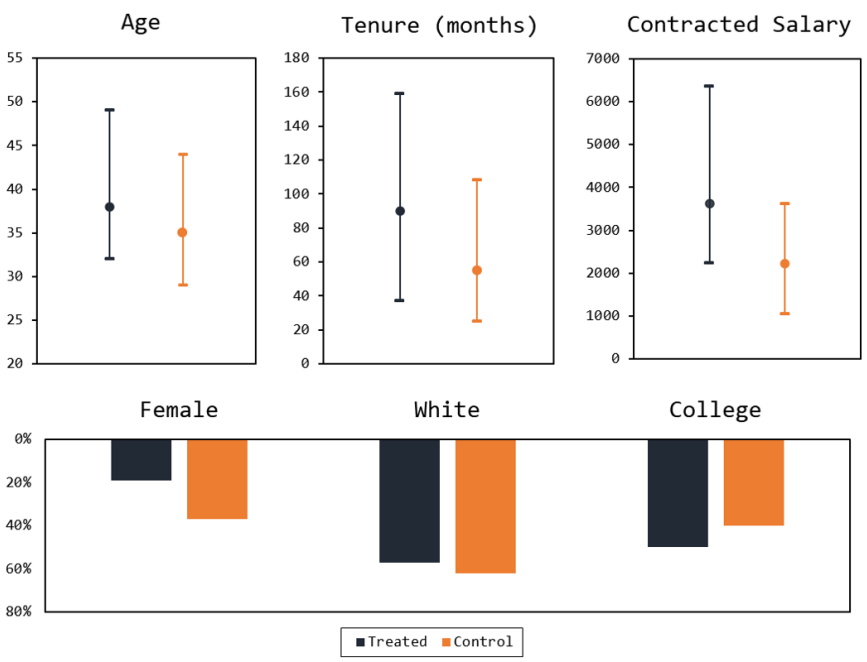

Figure 3. Comparison of Treatment and Control Groups: Upper panels represent the distribution of quartiles (Q1, Median and Q3) of continuous variables. In the lower panel, we plot the means of dummy variables, each of which equals one when each of the categories holds for each worker, and zero otherwise.

test the hypothesis that a rise in the credit risk of the employer increases the credit risk of employees and worsens employees' credit terms.

Our identifying assumption is that changes in loan terms and credit risk in the control group provide a good counterfactual suggesting what would have happened in the absence of a credit rating downgrade in the treatment group. In our within-bank estimation, and with the powerful set of variables we utilize to control for borrower characteristics and employment details, we mitigate significant threats to this assumption.

In Figure 3 we compare characteristics for the treatment and control groups in the month before a downgrade. Overall, there is no noticeable discrepancy. Tenure and age profiles are very similar. Treated employees have higher salaries and greater salary heterogeneity. Other than the proportion of female employees, which is lower for treated employees, there are no sizeable differences in the proportions of white or college-educated workers.

One concern that might arise is that firm executives exercise considerable control over both their banking outcomes and their credit risk as well as firm-level decisions, and hence over their firms' credit risk. In our main specifications, we truncate our sample to include only loans be-

longing to non-executive personnel in each company. We do so by excluding workers whose earnings are on or above the 95th percentile of earnings in each firm, when we presennt our main results. We validate this cutoff in Table A1, where we list the most predominant occupation codes among the top 5 percent of earners along with the most predominant occupation codes among the non-executive personnel. We later compare these results with those including only executives in the treatment and control groups.

Our baseline specification is a generalization of the traditional DID specification with the following form:

$$y_{i,f,t} = \alpha_t + \beta_T \cdot Treat_f + \beta_{DID} \cdot DID_{f,t} + \theta X_{i,f,t} + \varepsilon_{i,f,t} \tag{1}$$

where $y_{i,f,t}$ denotes the outcome of loan i for a borrower employed by firm f in year t. The year fixed effects α_t absorb all common time-series variation for both the treatment and control groups. To obtain within-bank estimates, we create an alternative specification by replacing α_t with bank-year fixed effects. $Treat_f$ is an indicator that equals one if the borrower's employer is ever downgraded throughout our sample period and zero otherwise. Its purpose is to control for time invariant differences in loan outcomes between treated and control loans. The coefficient of interest is β_{DID}, which corresponds to the indicator $DID_{f,t}$, which equals one when firm f is treated and year t is the year of the downgrade or any subsequent year. $X_{i,f,t}$ is a set of controls that include age, race, gender, educational attainment, contracted salary, weekly hours, and tenure. β_{DID} measures the conditional average change (pre- vs. post-downgrade) in the outcomes of borrowers who work for downgraded firms, relative to the average change for those who do not.

We find a total of 45 non-overlapping downgrades during our sample period, as indicated in Figure 4. Credit rating downgrades are spread widely in the timeseries. The bunching we observe in the first quarter of 2016 occurs as a result of a sovereign credit downgrade that Brazil experienced in February of that year.

Our outcomes of interest can be divided in three groups: (i) individual loan terms, including the interest rate and the log-loan amount; (ii) the term-structure of default, including 1-, 2- and 3-year-ahead indicators of any amount that is past due for more than 90 days; and (iii) consumer spending, proxied by the balance of non-interest-bearing credit cards paid in full.

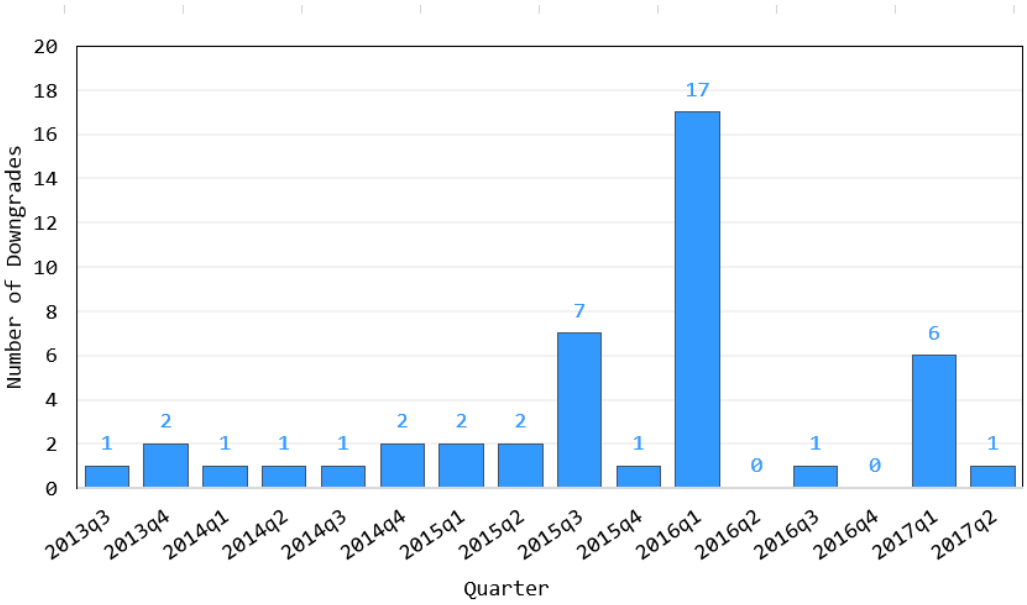

Figure 4. Time Series of Downgrades: In this figure, we plot counts of credit rating downgrade events per quarter for our sample period. There is a total of 45 downgrades.

We estimate the equation for each loan type, separately, as they correspond segmented markets with varying magnitudes for loan amounts, rates, maturities, and credit risk. We cluster standard errors by firm, since the treatment occurs at the same level, and effects within the same firm are not necessarily independently distributed.

4. Results

4.1 Employer Downgrades and Employee Default

We initially estimate Eq. (1) with default rates as the dependent variable. Standard errors are clustered at the firm level. Our model controls for differences in demographics and employment details for each borrower, such as age, gender, education, tenure, contracted salary, and hours. For each loan, in each year, we create a variable that equals one if there are amounts overdue for more than 90 days, in the following 1-, 2- or 3-year periods. The idea is that unless the probability of default on treated loans is higher, it becomes harder to rationalize any changes in loan terms. Figure 5 reports the results.

We focus on within-bank differences in defaults, leaving out differences in default risk caused by varying risk preferences among banks. We do so by including bank-year fixed effects. In Panel

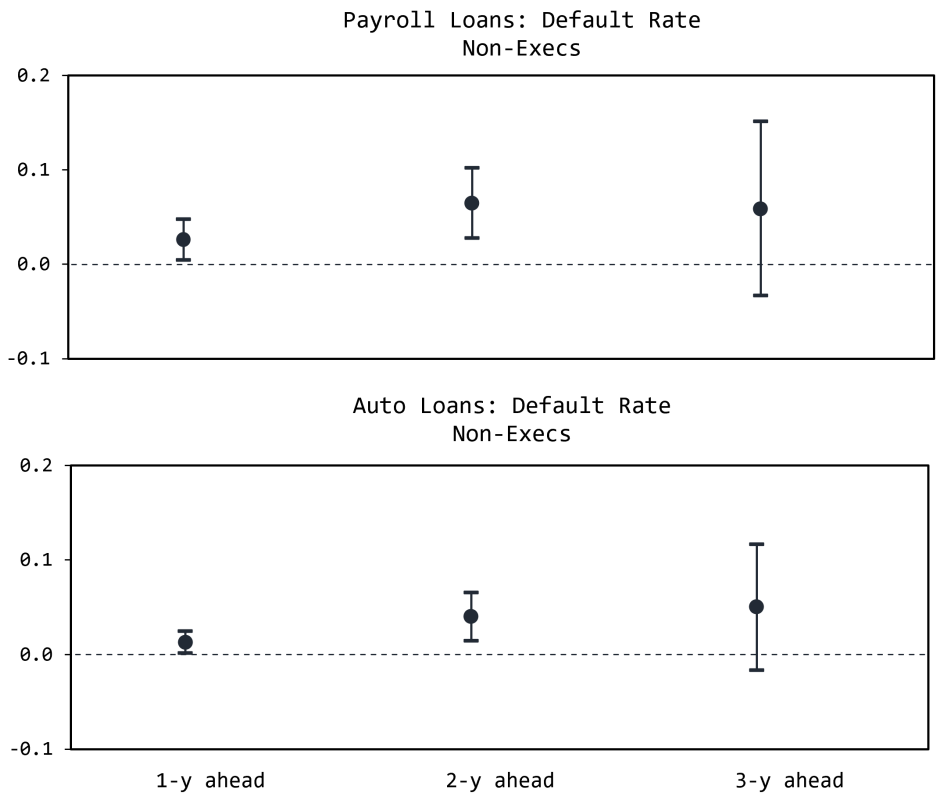

Figure 5. Main Results for Defaults: This figure shows β_{DID} coefficients as specified in Eq. (1), for default rates 1-, 2- and 3-years ahead. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Confidence intervals of 95 percent are represented around the point estimate. Bank-year fixed effects absorb all variation between banks in the same year. A tabulated version of these results can be found in Table A2.

A we report results for payroll loans, and in Panel B we report results for auto loans. The first noticeable pattern is that differences in default rates increase with the time horizon, suggesting some medium/long-term consequences for employees arising from their employers' credit risk.

Economically speaking, a differential of 4-5 percentage points in probabilities of default between treatment and control loans suggests a large spillover effect of corporate credit risk to their employees. Consistent with employment links playing a role in employer-employee credit risk propagation, payroll loans exhibit larger spillover effects.

Employees of distressed firms become riskier, establishing employer credit risk as a source of household credit risk. These findings reinforce the importance of considering labor relations as potential transmission channels of credit risk. Therefore, a banking system should not consider retail and corporate portfolios as two separate sources of risk that are connected solely through their exposure to credit risk.

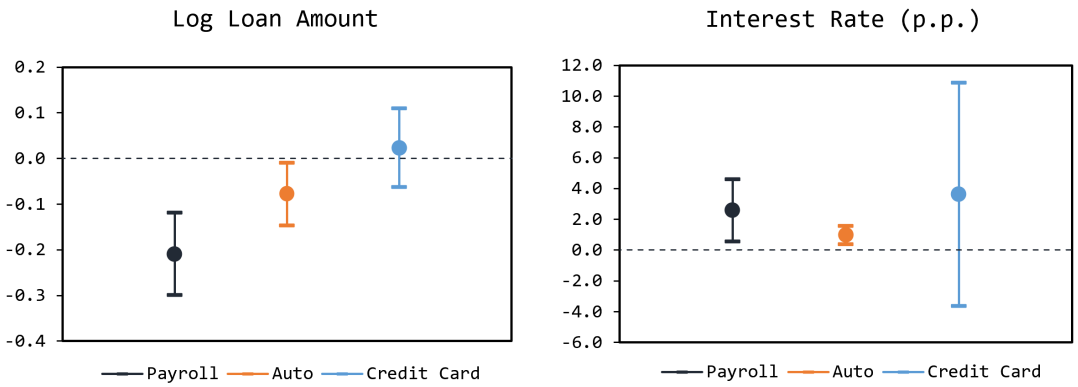

Figure 6. Main Results for Loan Terms: This figure shows β_{DID} coefficients as specified in Eq. (1), for payroll, auto, and credit card loans. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Confidence intervals of 95 percent are represented around the point estimate. The sample comprises loans for non-executive personnel in publicly listed firms. The complete regression output is reported in Table A3.

4.2 Employer Downgrades and Employee Loan Terms

We observe that employees of downgraded firms become riskier after the downgrade, when compared to otherwise similar employees. A natural questions is whether it causes changes to the terms of credit they obtain. In Figure 6, we plot DID coefficients for the logarithm of loan amount and interest rates as dependent variables.

In dark blue, we observe that workers in downgraded firms, after a rating downgrade, experience a 20 percent reduction in their loan amounts and a 2.58 percentage point increase in the interest rates of payroll loans relative to employees of firms that did not receive downgrades. Similar qualitative results are observed for auto loans, represented in orange: a 7.8 percent reduction in the loan amount and an almost 1 percentage point higher price of credit. These results are sizeable when comparing to the means observed in Table 1. No significant effects are observed for credit cards, represented in light blue.

Evidence of the interpretability of our model can be extracted by considering the coefficients of other covariates associated with creditworthiness through socio-economic fundamentals, shown in Table A3. For instance, white borrowers receive higher loan amounts with lower interest rates, as do male borrowers. Longer employment tenure, proxying for job stability, is also related to better credit terms. These relationships are clear in the point estimates for all loan types.

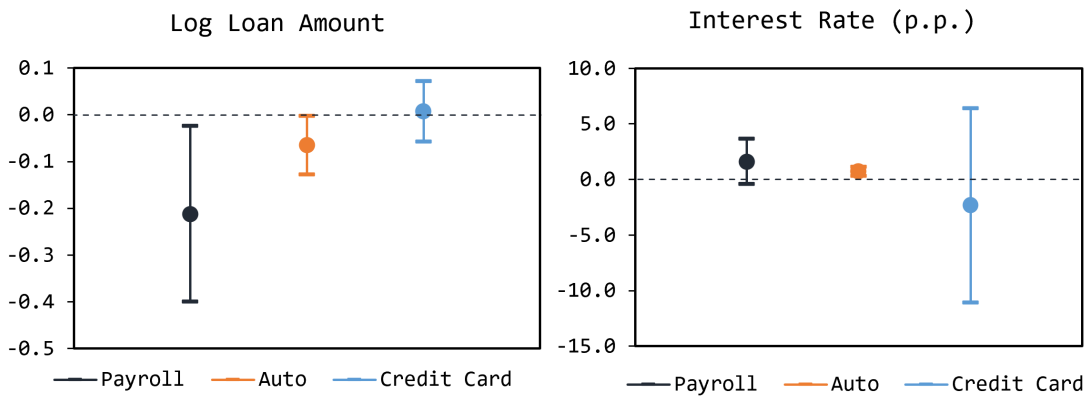

Figure 7. Main Results for Loan Terms, Within-Bank Effects: This figure shows β_{DID} coefficients as specified in Eq. (1), for payroll, auto, and credit card loans. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Confidence intervals of 95 percent are represented around the point estimate. Bank-year fixed effects absorb all variation between banks in the same year. The sample comprises loans for non-executive personnel in publicly listed firms. The complete regression output is reported in Table A4.

These results, although qualitatively consistent with a reduction in bank credit supply, should be interpreted with caution. On the one hand, we are observing how the equilibrium changes in the credit market, and when the quantity decreases and the price increases, it is usually the case that lower supply prevails. On the other hand, it could be the case that workers from different firms bank with different institutions that make different credit-management decisions that could result in the same outcome. If that is the case, we cannot cleanly establish the interpretation of a credit-risk spillover.

To address these concerns and obtain a more precise estimate of the spillover effects, we focus on within-bank variation, by replacing year fixed effects with bank-year fixed effects.

The coefficients reported in Figure 7 alleviate the abovementioned concerns because we observe the same pattern, both qualitatively and quantitatively: a sharp drop in the amount of credit supplied for payroll and auto loans, and a sizeable increase in the interest rate. The absence of a result for credit cards is also confirmed, and can be attributed to the fact that we observe credit cards only conditional on origination, while after origination the same credit card in the same bank might exhibit very similar contractual terms across borrowers.

Focusing on auto and payroll loans, these results are consistent with the idea that the same bank treats borrowers whose employers suffer credit rating downgrades as borrowers with higher credit risk. The average reduction in loan amount after the rating downgrade is 21.2 percent

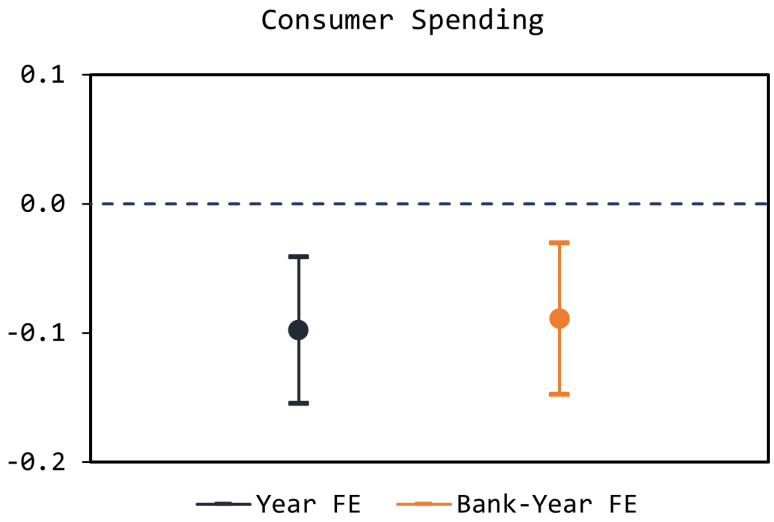

Figure 8. Main Results for Consumer Spending: This figure shows β_{DID} coefficients as specified in Eq. (1), for consumer spending. We proxy for consumer spending, using non-interest-bearing credit card amounts. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Confidence intervals of 95 percent are represented around the point estimate. Bank-year fixed effects absorb all variation between banks in the same year. The complete regression output is reported in Table A5.

for borrowers in treated firms for payroll loans, and 6.5 percent for auto loans. Payroll loans also experience higher interest rate sensitivity. This is consistent with the nature of each loan. Payroll loans are implicitly tied to an employee's pay, and hence repayment of such a loan is intrinsically tied to the employee's employment status.

The smaller, albeit significant effect of auto loans can be rationalized by reference to two main motives: on the one hand, car payments depend heavily on an average consumer's paycheck, so greater uncertainty about paychecks will imply greater uncertainty about repayment; on the other hand, a bank does not need to adjust the offered credit terms to the same extent as it would in payroll loans, since there is a vehicle with liquidation value as collateral.

4.3 Employer Downgrades and Employee Consumption

Understanding the real effects of credit risk transmissions is as important as understanding the financial dimension of the propagation of corporate credit risk to employees. Employees of distressed firms will reflect this tighter (current and intertemporal) budget constraint in their real choices, facing more severe financial constraints in the form of higher interest rates and lower

loan amounts. Our ability to identify non-interest-bearing credit cards allows us to construct a proxy for consumer spending. We measure consumer spending as the balance on credit cards that do not accrue interest. This means that such credit cards are used solely as means of payment and are paid in full in the end of each billing cycle, essentially representing consumption.

In Figure 8, we report results for consumer spending, using both the baseline specification with year fixed effects and the more conservative within-bank specification. Employees reduce consumer spending following an employer's credit rating downgrade. The effect a 9 to 10 percent reduction in consumer spending. These are large effects, especially for those who have higher marginal utility, as a result of lower levels of consumption during normal times.

Even though employees in distressed firms reduce their spending levels, they end up observing a higher increase in defaults than their similar counterparts. The result that the reduction in spending is insufficient to make ends meet. This inability to adjust and consequent deterioration of the financial health of these households, is suggestive of potential long-run consequences.

5. Robustness

A natural question is whether the executive personnel in downgraded companies are equally or at all affected by such an event in consumer credit markets. Two opposing forces are in play here: it is known that executives' pay is more sensitive to performance than that of non-executives, but it is also known that their salaries, financial literacy, and adjustment capacity are higher. Additionally, executives are the only one of the two groups who can directly influence or distort credit rating outcomes.

While the difference between executives and non-executives is interesting, we also need to rule out the fact that the executive sample yields statistically distinguishable estimates than those of our main sample. We exclude executives from our main results, under the argument that they are responsible for firms decisions that can generate credit rating downgrades. Focusing on auto and payroll loans, we estimate the same equation using the sample of executive personnel and report the results in Figure 9.

While we can reject a null effect for non-executives, but we cannot do so for executives, they are not statistically different from each other. The higher point estimate for non-executive per-

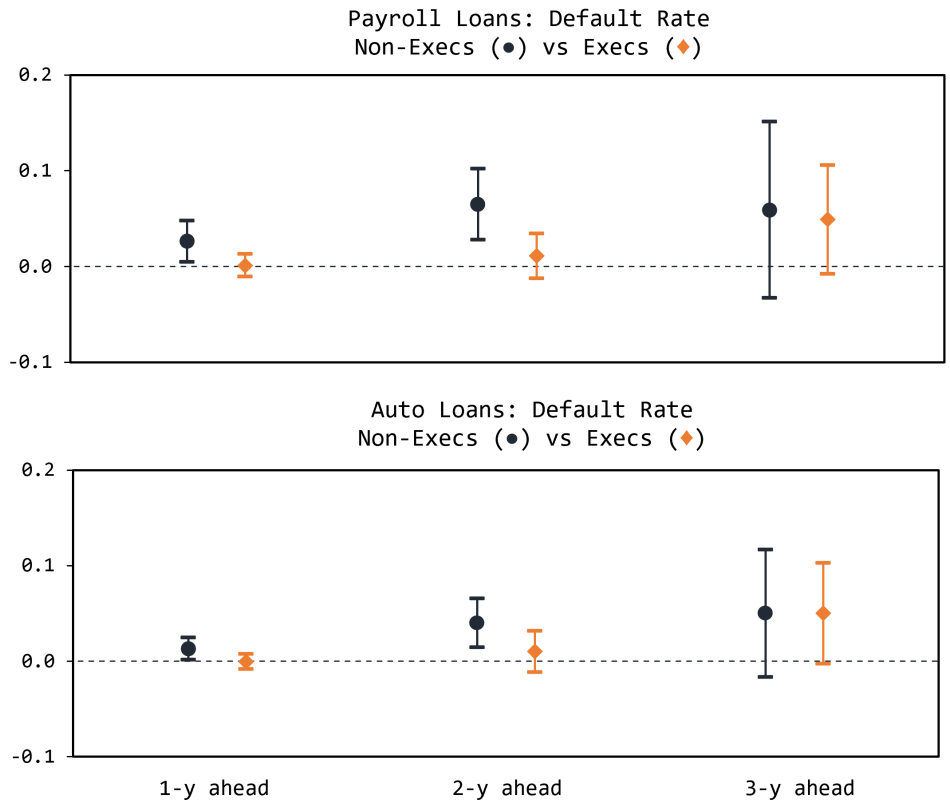

Figure 9. Robustness: Default Rates for Executives This figure shows β_{DID} coefficients as specified in Eq. (1), for default rates 1-, 2- and 3-years ahead. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Confidence intervals of 95 percent are represented around the point estimate. Bank-year fixed effects absorb all variation between banks in the same year. A tabulated version of these results can be found in Table A2.

sonnel than for executive personnel is consistent with the higher ability of executives to manage distressful situations, higher literacy, and higher wealth.

Our results suggest that the effects are concentrated mainly in payroll loans for executives, as is the case in our main sample. Effects on payroll loans are of the same order of magnitude of those in the sample of non-executive personnel. This suggests that the previously mentioned fact that payroll loans depend directly on an employer's ability to pay salaries plays a role in bank decisions, with respect to both to executive and non-executive borrowers. Auto loans also exhibit similar magnitudes, however we cannot reject that executives are granted the same credit at the same price. Our interpretation of that result is that it is unlikely that an executive would not be able to make her car payment following a downgrade, and she would likely put up more valuable cars as collateral, regardless of her employment status.

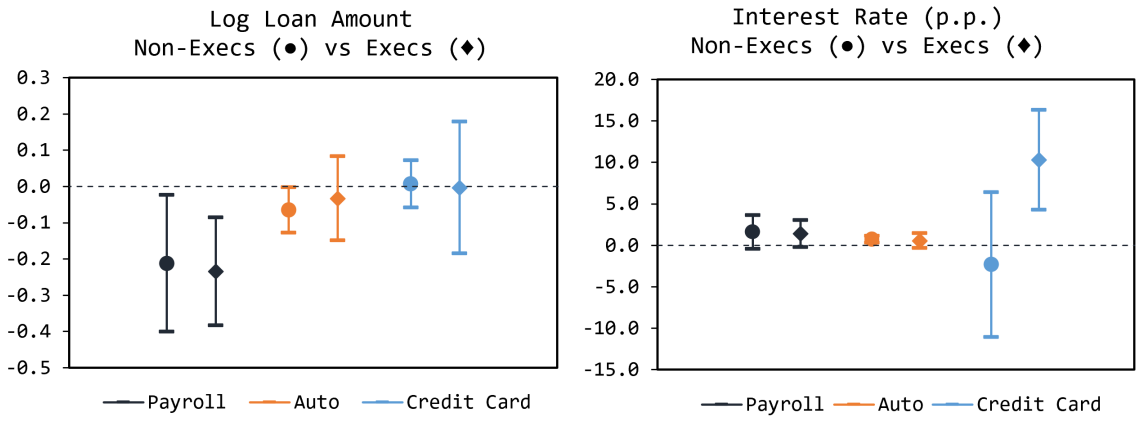

Figure 10. Robustness: Loan Terms for Executives This figure shows β_{DID} coefficients as specified in Eq. (1), for payroll, auto, and credit card loans. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Confidence intervals of 95 percent are represented around the point estimate. Bank-year fixed effects absorb all variation between banks in the same year. The samples are loans for executive personnel of publicly listed firms, shown in diamonds, and non-executive personnel, shown in circles. The complete regression output for the executive sample is reported in Table A6.

The implications of these results are twofold: for loans that are intrinsically related to employer's payroll, all employees are affected by a credit rating downgrade, obtaining lower loan amounts and more expensive credit from their banks; for loans determined by a worker's ability to repay, as is the case with car payments, and by collateral value, only non-executive personnel experience detectable effects on loan terms.

Executives experience only a 5 percent reduction in consumer spending, which in magnitude alone is half of the effect of our main sample. We cannot assert, however, that there is a statistically significant difference in the effects between executives and non-executives. Our results are robust across employee types, in terms of magnitude. The lower number of executives in a firm, when compared with non-executives, leaves us with much less observations in the executive sample. That produces larger standard errors, increasing the probability that the confidence interval of our estimates includes zero effects.

6. Conclusion

In this study we provide novel evidence of credit-risk spillovers from companies to their employees. Our credit registry data matched to an employer-employee dataset allow us to observe

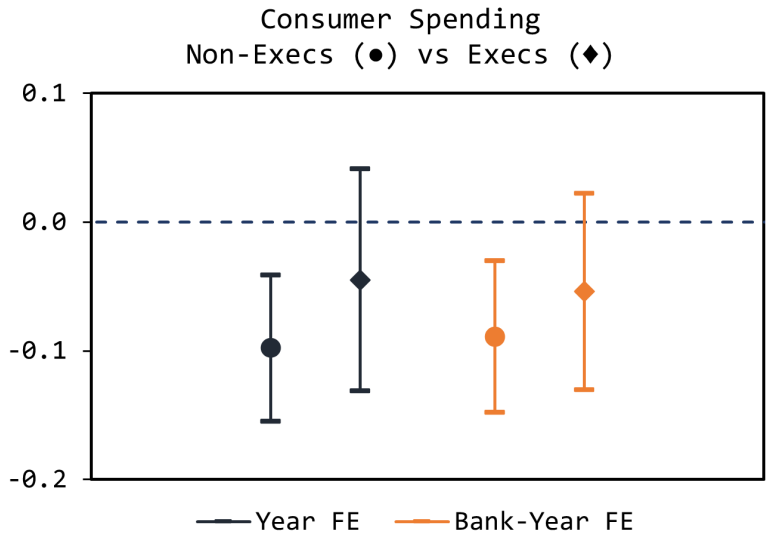

Figure 11. Robustness: Consumer Spending for Executives This figure shows β_{DID} coefficients as specified in Eq. (1), for consumer spending. We proxy for consumer spending, using non-interest-bearing credit card amounts. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Confidence intervals of 95 percent are represented around the point estimate. Bank-year fixed effects absorb all variation between banks in the same year. The samples are loans for executive personnel of publicly listed firms, shown in diamonds, and non-executive personnel, shown in circles. The complete regression output is reported in Table A5.

not only loan terms, but also employment details and demographics. Our identification strategy uses corporate credit rating downgrades as a sharp change in an employer's credit risk, which restricts the company's access to credit markets.

We find that credit risk spills over to employees, who become more likely to default at 1-, 2- and 3-year time horizons. In turn, banks reduce the amount of credit they can obtain and increase the interest rates on payroll and auto loans. The effects are stronger for payroll loans, which are, by nature, more closely tied to a firm's ability to make payments, and they are robust between white-collar and blue-collar workers. Additionally, we show that employees in downgraded firms reduce consumption, following an employer's downgrade.

Our results show that corporate credit risk is tied to consumer credit risk through labor relationships—unemployment risk—with strong propagation to employees. This has implications both for future research and policy-making, as this connection should be considered. Our estimates of the effects of a downgrade on loan terms, default incidence, and consumer spending are sizable. The fact that such a credit rating downgrade is generated in a consumer's employer,

and that its consequences propagate through the banking system, with unequal impacts in already unequal individuals, deserves further attention in the field of finance.

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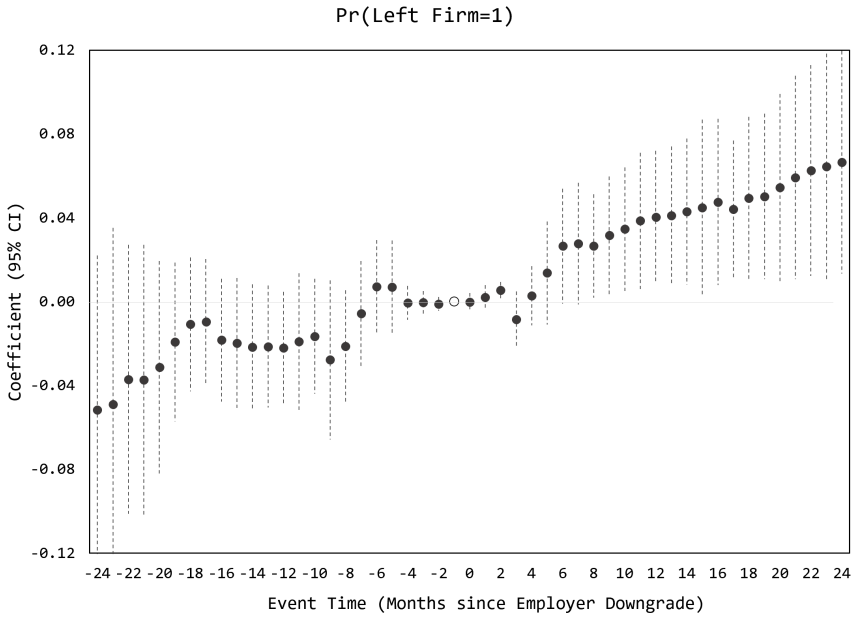
(a) Propensity to Leave a Firm



(b) Propensity to Be Fired

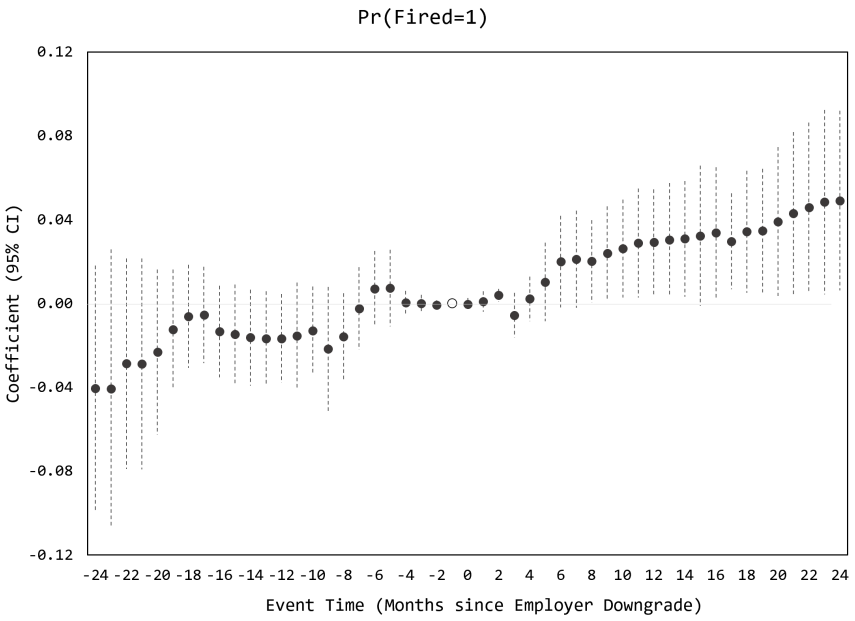


Figure A1. Employment Outcomes for Workers in Downgraded Firms. This figure shows event-study coefficients of employment outcomes for workers in downgraded firms, estimated with worker and quarter fixed effects. Observations are monthly and the reference period is one month before a downgrade.

Table A1. Threshold for Executive Personnel: In this table, we report the five most predominant occupation codes within the top 5 percent of earners of each company (*executive personnel*) and within the remaining workers (*non-executive personnel*), according to the Brazilian Occupation Classification (CBO 2002).

I (Top 5% Earner)		Most Frequent Categories (CBO 2002 Classification)
0	73	Telecommunication Assemblers/Installers
	64	Workers of Agricultural/Forestry Mechanization
	78	Vehicle/Machine Operators
	86	Power/Water Installation Operators
	75	Jewelers, Craftsmen, Glassmakers, Potters
1	12	Company Directors
	13	Directors and Managers, Social Services, Education and Health
	61	Agricultural Producers
	24	Lawyers, Public Defenders, Attorneys
	20	Professional Scientists

Table A2. Main Results for Default: This table shows regression results for payroll, auto, and credit card loans in a difference-in-differences setting. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Standard errors are reported in parentheses and p-values are reported in brackets. Bank-year fixed effects absorb all variation between banks in the same year. The sample comprises loans for executive personnel in publicly listed firms.

Panel A: Payroll Loans

	1-Year Ahead		2-Years Ahead		3-Years Ahead	
	Non-Exec	Executive	Non-Exec	Executive	Non-Exec	Executive
DID	0.026	0.001	0.065	0.011	0.059	0.049
	(0.011)	(0.006)	(0.019)	(0.012)	(0.047)	(0.029)
	[0.016]	[0.834]	[0.001]	[0.348]	[0.205]	[0.090]
Fixed-Effects	Bank-Year	Bank-Year	Bank-Year	Bank-Year	Bank-Year	Bank-Year
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Loan-Years	2,033,076	82,482	1,288,198	49,022	793,290	27,685
Adjusted R2	0.048	0.035	0.195	0.187	0.362	0.366

Panel B: Auto Loans

	1-Year Ahead		2-Years Ahead		3-Years Ahead	
	Non-Exec	Executive	Non-Exec	Executive	Non-Exec	Executive
DID	**0.013**	0.000	0.040	0.010	0.050	0.050
	(0.006)	(0.004)	(0.013)	(0.011)	(0.034)	(0.027)
	[0.023]	[0.915]	[0.003]	[0.405]	[0.135]	[0.067]
Fixed-Effects	Bank-Year	Bank-Year	Bank-Year	Bank-Year	Bank-Year	Bank-Year
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Loan-Years	1,242,269	95,376	661,640	44,750	330,696	19,413
Adjusted R2	0.061	0.047	0.194	0.174	0.333	0.324

Table A3. Main Results for Loan Terms: This table shows regression results for payroll, auto, and credit card loans, in a difference-in-differences setting. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Standard errors are in reported parentheses and p-values are reported in brackets. The sample comprises loans for non-executive personnel in publicly listed firms.

	Payroll		Auto		Interest-Bearing Credit Card	
	Loan Amount	Interest Rate	Loan Amount	Interest Rate	Loan Amount	Interest Rate
DID	-0.209	2.579	-0.078	0.960	0.023	3.606
	(0.046)	(1.031)	(0.035)	(0.306)	(0.044)	(3.697)
	[0.000]	[0.013]	[0.028]	[0.002]	[0.606]	[0.330]
Treat	0.146	-2.915	-0.084	0.163	-0.227	6.563
	(0.138)	(1.655)	(0.061)	(0.569)	(0.080)	4-603
	[0.292]	[0.079]	[0.169]	[0.776]	[0.005]	[0.154]
College Degree	0.613	-1.129	0.259	-4.136	0.475	-14.807
	(0.170)	(0.681)	(0.058)	(0.309)	(0.084)	(1.703)
	[0.000]	[0.098]	[0.000]	[0.000]	[0.005]	[0.000]
White	0.175	-0.566	0.054	-1.468	0.118	-6.424
	(0.038)	(0.584)	(0.013)	(0.160)	(0.021)	(1.149)
	[0.000]	[0.333]	[0.000]	[0.000]	[0.000]	[0.000]
Age	0.007	-0.055	-0.001	-0.045	0.005	-0.033
	(0.003)	(0.017)	(0.002)	(0.021)	(0.003)	(0.211)
	[0.006]	[0.002]	[0.501]	[0.029]	[0.111]	[0.875]
Female	-0.001	0.030	0.069	-0.654	0.115	-3.046
	(0.056)	(0.674)	(0.022)	(0.164)	(0.024)	(1.275)
	[0.992]	[0.965]	[0.003]	[0.000]	[0.000]	[0.017]
Employment Tenure	0.000	-0.005	-0.001	-0.003	0.000	-0.054
	(0.000)	(0.003)	(0.000)	(0.002)	(0.000)	(0.017)
	[0.820]	[0.039]	[0.069]	[0.142]	[0.738]	[0.002]
Contracted Hours	-0.041	0.235	-0.023	0.289	-0.028	0.993
	(0.006)	(0.103)	(0.003)	(0.049)	(0.005)	(0.401)
	[0.000]	[0.023]	[0.000]	[0.000]	[0.000]	[0.014]
Salary (BRL)	0.000	0.000	0.000	-0.001	0.000	-0.002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.019]	[0.000]	[0.000]	[0.000]	[0.000]
Fixed-Effects	Year	Year	Year	Year	Year	Year
Loan-Years	2,570,755	2,570,755	1,820,949	1,820,949	2,985,416	2,985,416
Adjusted R2	0.267	0.055	0.088	0.168	0.140	0.058

Table A4. Main Results for Loan Terms, Within-Bank Effects: This table shows regression results for payroll, auto, and credit card loans, in a difference-in-differences setting. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Standard errors are reported in parentheses and p-values are reported in brackets. The sample comprises loans for non-executive personnel in publicly listed firms.

	Payroll		Auto		Interest-Bearing Credit Card	
	Loan Amount	Interest Rate	Loan Amount	Interest Rate	Loan Amount	Interest Rate
DID	-0.212	1.615	-0.065	0.733	0.007	-2.336
	(0.096)	(1.038)	(0.032)	(0.207)	(0.033)	(4.454)
	[0.028]	[0.120]	[0.039]	[0.001]	[0.843]	[0.600]
Treat	0.145	-2.047	-0.084	0.110	-0.159	11.941
	(0.145)	(1.202)	(0.050)	(0.391)	(0.082)	(4.574)
	[0.416]	[0.089]	[0.097]	[0.779]	[0.052]	[0.010]
College Degree	0.477	-2.971	0.228	-3.177	0.440	-13.338
	(0.092)	(0.791)	(0.059)	(0.250)	(0.060)	(1.636)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
White	0.089	-0.385	0.042	-1.200	0.120	-8.166
	(0.013)	(0.243)	(0.012)	(0.111)	(0.021)	(1.122)
	[0.000]	[0.114]	[0.000]	[0.000]	[0.000]	[0.000]
Age	0.005	-0.075	-0.002	-0.042	0.004	-0.249
	(0.002)	(0.017)	(0.002)	(0.010)	(0.002)	(0.136)
	[0.007]	[0.000]	[0.186]	[0.000]	[0.057]	[0.069]
Female	0.010	-0.343	0.072	-0.640	0.082	-0.289
	(0.032)	(0.267)	(0.020)	(0.126)	(0.017)	(0.832)
	[0.751]	[0.199]	[0.000]	[0.000]	[0.000]	[0.729]
Employment Tenure	0.000	-0.005	-0.001	-0.001	0.000	-0.044
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.014)
	[0.460]	[0.000]	[0.037]	[0.266]	[0.799]	[0.002]
Contracted Hours	-0.029	0.305	-0.018	0.208	-0.028	0.944
	(0.004)	(0.049)	(0.003)	(0.029)	(0.004)	(0.352)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.008]
Salary (BRL)	0.000	0.000	0.000	0.000	0.000	-0.002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Fixed-Effects	Bank-Year	Bank-Year	Bank-Year	Bank-Year	Bank-Year	Bank-Year
Loan-Years	2,570,755	2,570,755	1,820,949	1,820,949	2,985,416	2,985,416
Adjusted R2	0.347	0.302	0.119	0.292	0.189	0.205

Table A5. Main Results for Consumption: This table shows regression results for consumption in a difference-in-differences setting. We proxy for consumption using non-interest-bearing credit card amounts. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Standard errors are reported in parentheses and p-values are reported in brackets. Bank-year fixed effects absorb all variation between banks in the same year.

	Non-Interest Bearing Credit Cards Utilization (Consumption)			
	Non-Executives		Executives	
DID	-0.098	-0.089	-0.045	-0.054
	(0.029)	(0.030)	(0.044)	(0.039)
	[0.001]	[0.004]	[0.310]	[0.163]
Treat	-0.057	-0.026	0.073	0.060
	(0.070)	(0.075)	(0.114)	(0.115)
	[0.413]	[0.724]	[0.523]	[0.600]
College Degree	0.509	0.488	0.301	0.276
	(0.063)	(0.045)	(0.037)	(0.031)
	[0.000]	[0.000]	[0.000]	[0.000]
White	0.152	0.154	0.122	0.120
	(0.014)	(0.012)	(0.016)	(0.017)
	[0.000]	[0.000]	[0.000]	[0.000]
Age	0.005	0.005	0.003	0.003
	(0.002)	(0.001)	(0.002)	(0.001)
	[0.010]	[0.002]	[0.087]	[0.027]
Female	0.075	0.060	0.023	0.016
	(0.023)	(0.018)	(0.019)	(0.016)
	[0.001]	[0.002]	[0.231]	[0.300]
Employment Tenure	0.000	0.000	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)
	[0.477]	[0.271]	[0.013]	[0.004]
Contracted Hours	-0.021	-0.022	-0.027	-0.024
	(0.003)	(0.004)	(0.010)	(0.007)
	[0.000]	[0.000]	[0.010]	[0.000]
Salary (BRL)	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.000]	[0.000]
Fixed-Effects	Year	Bank-Year	Year	Bank-Year
Loan-Years	4,056,323	4,056,323	449,272	449,272
Adjusted R2	0.194	0.218	0.128	0.155

Table A6. Main Results for Loan Terms, Executive Personnel: This table shows regression results for payroll, auto, and credit card loans in a difference-in-differences setting. A loan is treated in the year its borrower's employer suffered a credit rating downgrade and thereafter. Standard errors are clustered by firm. Standard errors are reported in parentheses and p-values are reported in brackets. Bank-year fixed effects absorb all variation between banks in the same year. The sample comprises loans for executive personnel in publicly listed firms.

	Payroll				Auto Loans			
	Loan Amount		Interest Rate		Loan Amount		Interest Rate	
DID	-0.198	-0.234	2.307	1.415	-0.043	-0.033	0.697	0.546
	(0.073)	(0.076)	(0.696)	(0.823)	(0.060)	(0.059)	(0.631)	(0.454)
	[0.007]	[0.003]	[0.001]	[0.086]	[0.477]	[0.580]	[0.269]	[0.229]
Treat	0.124	0.202	-1.294	0.016	-0.081	-0.077	-0.019	0.086
	(0.097)	(0.116)	(1.947)	(1.457)	(0.096)	(0.079)	(0.407)	(0.384)
	[0.202]	[0.082]	[0.507]	[0.991]	[0.401]	[0.332]	[0.963]	[0.823]
College Degree	0.190	0.185	-1.492	-1.087	0.009	-0.006	-3.118	-2.413
	(0.059)	(0.048)	(0.641)	(0.436)	(0.030)	(0.027)	(0.194)	(0.155)
	[0.002]	[0.000]	[0.020]	[0.013]	[0.758]	[0.812]	[0.000]	[0.000]
White	0.144	0.079	-0.876	-0.530	0.007	0.008	-1.337	-1.068
	(0.032)	(0.023)	(0.634)	(0.244)	(0.021)	(0.020)	(0.126)	(0.104)
	[0.000]	[0.001]	[0.168]	[0.031]	[0.754]	[0.683]	[0.000]	[0.000]
Age	0.006	0.005	-0.096	-0.109	-0.004	-0.005	-0.051	-0.042
	(0.002)	(0.002)	(0.033)	(0.017)	(0.001)	(0.001)	(0.008)	(0.007)
	[0.008]	[0.003]	[0.004]	[0.000]	[0.005]	[0.000]	[0.000]	[0.000]
Female	-0.004	-0.008	1.293	0.011	-0.013	-0.001	-0.743	-0.596
	(0.035)	(0.028)	(0.508)	(0.232)	(0.018)	(0.015)	(0.141)	(0.110)
	[0.909]	[0.778]	[0.011]	[0.962]	[0.475]	[0.961]	[0.000]	[0.000]
Employment Tenure	-0.001	-0.001	-0.006	-0.004	-0.001	-0.001	-0.002	-0.001
	(0.000)	(0.000)	(0.003)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.073]	[0.005]	[0.003]	[0.000]	[0.053]	[0.280]
Contracted Hours	-0.023	-0.019	0.242	0.254	-0.022	-0.017	0.103	0.078
	(0.007)	(0.006)	(0.135)	(0.066)	(0.010)	(0.005)	(0.035)	(0.029)
	[0.002]	[0.001]	[0.075]	[0.000]	[0.023]	[0.001]	[0.004]	[0.007]
Salary (BRL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.039]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Fixed-Effects	Year	Bank-Year	Year	Bank-Year	Year	Bank-Year	Year	Bank-Year
Loan-Years	111,212	111,212	111,212	111,212	152,050	152,050	152,050	152,050
Adjusted R2	0.199	0.263	0.087	0.370	0.048	0.074	0.108	0.274