Technical Appendix to
Court Enforcement, Bank Loans and Firm Investment: Evidence from a Bankruptcy Reform in Brazil: Not for Publication

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A1 Introduction

This technical appendix contains a detailed exposition of the theoretical framework presented in the paper (Section A2), a description of the variables used in the empirical analysis along with their data sources (Section A3), and supplementary Figures and Tables (Section A4).

A2 Conceptual Framework

This section provides a formal exposition of the conceptual framework presented in section 3 of the paper.

Demand

The consumer utility function takes the C.E.S. form: $U = \left(\int_{\omega \in \Omega} y(\omega)^{\frac{\sigma-1}{\sigma}} d\omega\right)^{\frac{\sigma}{\sigma-1}}$, where $\sigma > 1$ is the elasticity of substitution across different varieties (identified by ω). Maximizing this utility function subject to the expenditure constraint $\int_{\omega \in \Omega} p(\omega) y(\omega) d\omega = E$, where E is the aggregate spending in this economy, gives the demand for a single variety:

$$y(\omega) = \left(\frac{p(\omega)}{P}\right)^{-\sigma} \frac{E}{P}$$

where $P = \left(\int_{\omega \in \Omega} p(\omega)^{1-\sigma} d\omega\right)^{\frac{1}{1-\sigma}}$ is the aggregate price index.

Supply

As described in section 3, firms can produce using two different technologies: a *low* technology and a *high* technology. Production under different technologies is described by the following total cost functions:

$$TC = \begin{cases} f + \frac{y}{\varphi} & \text{if technology } = low \\ \eta f + \frac{y}{\gamma\varphi} & \text{if technology } = high \ (\eta, \gamma > 1) \end{cases}$$

Solving the profit maximization problem gives an expression for the price of single variety: $p = \left(\frac{\sigma}{\sigma-1}\right)\frac{1}{\varphi}$.

Using definition of quantity demanded and price one can get an expression for firm profits under different technologies:

$$\begin{aligned}\pi^L(\varphi) &= \alpha(\varphi)^{\sigma-1} - f = \bar{\pi}^L - f \quad \text{if technology} = low \\ \pi^H(\varphi) &= \alpha(\gamma\varphi)^{\sigma-1} - \eta f = \bar{\pi}^H - \eta f \quad \text{if technology} = high\end{aligned}$$

where $\alpha = \left(\frac{\sigma-1}{\sigma}\right)^{\sigma-1} \frac{E}{\sigma} P^{\sigma-1}$.

Cut-off productivities

- The productivity cutoff above which firms find it profitable to stay in the market is pinned down by the zero profit condition for a firm using the low technology: $\pi^L(\varphi^*) = 0$.

$$(\varphi^*)^{\sigma-1} = \frac{f}{\alpha}$$

- The productivity cutoff above which firms find it profitable to switch to the high technology is pinned down by equalizing profits under the low and the high technology ($\pi^H(\varphi^h) = \pi^L(\varphi^h)$).

$$(\varphi^h)^{\sigma-1} = \frac{f}{\alpha} \frac{(\eta - 1)}{(\gamma^{\sigma-1} - 1)}$$

- Productivity cutoff above which firms are unconstrained and can borrow enough to switch to the high technology is pinned down by setting the maximum borrowing capacity equal to the fixed cost to adopt the high technology: $b(\varphi^u) = \eta f$.

$$(\varphi^u)^{\sigma-1} = \frac{1}{\lambda_j} \frac{\eta f}{\alpha\gamma^{\sigma-1}}$$

Firms for which $\varphi^h \leqslant \varphi < \varphi^u$ would like to update their technology but can not do it due to financial frictions. One can show that $(\varphi^u)^{\sigma-1} > (\varphi^h)^{\sigma-1} \iff \frac{1}{\lambda_j} > \frac{\gamma^{\sigma-1}}{\gamma^{\sigma-1}-1} \frac{\eta-1}{\eta}$. That is, financially constrained firms are more likely to exist when λ_j — i.e. the share of firm value that creditors can recover in case of liquidation in municipality j — is low. Figure A1 shows in red the optimal technological choice as a function of a transformation of firm productivity ($\varphi^{\sigma-1}$) when: $(\varphi^u)^{\sigma-1} > (\varphi^h)^{\sigma-1}$.

Equilibrium

Since the main predictions of the model depend on the effect of λ_j on the equilibrium expressions of the cutoff productivities, we start by defining the industry equilibrium.

The industry equilibrium is pinned down by the zero profit condition and the free entry condition. Free entry requires the one-and-for-all fixed entry cost to be equal to the present value of expected profits, discounted by the per-period probability of exit due to a bad shock (e):

$$f_e = [1 - G(\varphi^*)]\frac{\tilde{\pi}}{e} \tag{A1}$$

where $[1 - G(\varphi^*)]$ is the probability of survival, i.e., the probability of drawing a productivity higher than the exit cutoff productivity (φ^*). When financial frictions play a role, expected profits are defined as follows:

$$\tilde{\pi} = p^u\tilde{\pi}^u + p^c\tilde{\pi}^c \tag{A2}$$

where p^u is the probability of an active firm being productive enough to be financially unconstrained and p^c is the probability of being financially constrained (both conditional on being active). Formally, $p^u = \frac{1-G(\varphi^u)}{1-G(\varphi^*)}$, and $p^c = \frac{G(\varphi^u)-G(\varphi^*)}{1-G(\varphi^*)}$. If the firm is unconstrained, then its expected profits are given by:

$$\tilde{\pi}^u = \int_{\varphi^*}^{\varphi^h} \pi^L(\varphi)\frac{g(\varphi)}{1-G(\varphi^*)} + \int_{\varphi^h}^{\infty} \pi^H(\varphi)\frac{g(\varphi)}{1-G(\varphi^*)} \tag{A3}$$

Substituting in the expressions for $\pi^L(\varphi)$ and $\pi^H(\varphi)$, assuming that $G(\varphi)$ is a Pareto distribution with support equal to 1 and shape parameter k and using the zero profit condition, one can write equation (A3) as a function of the model's parameters.

$$\tilde{\pi}^u = \frac{f(\sigma-1)}{k-\sigma+1}\left[1 + \left(\frac{\eta-1}{\gamma^{\sigma-1}-1}\right)^{-\frac{k}{\sigma-1}}(\eta-1)\right] \tag{A4}$$

If a firm is constrained instead, its expected profits are given by:

$$\tilde{\pi}^c = \int_{\varphi^*}^{\infty} \pi^L(\varphi)\frac{g(\varphi)}{1-G(\varphi^*)} = \frac{f(\sigma-1)}{k-\sigma+1} \tag{A5}$$

Equation (A4) captures the fact that if a firm is unconstrained it will always be able to choose the most profitable technology given its initial productivity. If a firm is constrained, instead, it will work with a low technology even if it would be productive enough to switch to a more productive technology in an unconstrained world. Equation (A4) shows how expected profits for an unconstrained firm are equal to expected profits for a constrained one, augmented by the potential extra profits from using the high technology multiplied by the probability of being productive enough to be able to adopt it.

Substituting equations of expected profits for unconstrained (A4) and constrained (A5) firms into equation (A2) we obtain an expression for expected profits in an industry with financial frictions:

$$\tilde{\pi} = \frac{f(\sigma-1)}{k-\sigma+1}\Delta \tag{A6}$$

where:

$$\Delta(\lambda_j) = \left(1 + \left(\frac{\eta}{\lambda_j \gamma^{\sigma-1}}\right)^{-\frac{k}{\sigma-1}} \left(\frac{\eta-1}{\gamma^{\sigma-1}-1}\right)^{-\frac{k}{\sigma-1}} (\eta-1)\right)$$

Substituting equation (A6) in equation (A1) and assuming $G(\varphi)$ is a Pareto distribution, the equilibrium cutoff productivities can be written as:

$$\varphi^* = [\Psi f \Delta(\lambda_j)]^{\frac{1}{k}}$$

$$\varphi^h = [\Psi f \Delta(\lambda_j)]^{\frac{1}{k}} \left(\frac{\eta-1}{\gamma^{\sigma-1}-1}\right)^{\frac{1}{\sigma-1}}$$

$$\varphi^u = [\Psi f \Delta(\lambda_j)]^{\frac{1}{k}} \left(\frac{\eta}{\lambda_j \gamma^{\sigma-1}}\right)^{\frac{1}{\sigma-1}}$$

where $\Psi = \frac{1}{f_e \delta} \frac{(\sigma-1)}{(k-\sigma+1)}$ is a positive constant that depends on model's exogenous parameters.

The empirical predictions are obtained by taking derivatives with respect to λ_j of the equilibrium cutoff productivities.

Proposition 1: *An increase in λ_j lowers the cutoff productivity for being financially unconstrained (φ^u).*

Proof:
$\varphi^u = [\Psi f]^{\frac{1}{k}} \frac{\eta^{\frac{1}{\sigma-1}}}{\gamma} \left(\frac{\Delta(\lambda_j)^{\frac{1}{k}}}{\lambda_j^{\frac{1}{\sigma-1}}}\right)$

so that $\frac{\partial \varphi^u}{\partial \lambda_j}$ has the same sign as the derivative of the last element of the previous expression with respect to λ_j.

One can rewrite this last element as:
$\left[\left(\frac{1}{\lambda_j^{\frac{1}{\sigma-1}}}\right)^k + \left(\frac{1}{\lambda_j^{\frac{1}{\sigma-1}}}\right)^k \left(\frac{\eta}{\lambda_j \gamma^{\sigma-1}}\right)^{-\frac{k}{\sigma-1}} \left(\frac{\eta-1}{\gamma^{\sigma-1}-1}\right)^{-\frac{k}{\sigma-1}} (\eta-1)\right]^{\frac{1}{k}}$

Taking derivatives with respect to λ_j gives:
$\frac{1}{k}\left[\lambda_j^{-\frac{k}{\sigma-1}} + \left(\frac{\eta}{\gamma^{\sigma-1}}\right)^{-\frac{k}{\sigma-1}} \left(\frac{\eta-1}{\gamma^{\sigma-1}-1}\right)^{-\frac{k}{\sigma-1}} (\eta-1)\right]^{\frac{1}{k}-1} \left[-\frac{k}{\sigma-1}\lambda_j^{-\frac{k}{\sigma-1}-1}\right] < 0$

since $\eta, \gamma, \sigma > 1$ and $\kappa > 0$

Proposition 1 states that an increase in the share of firm value that can be recovered by creditors in court will decrease the number of firms that are financially constrained. One can think of the main empirical effect of the reform as an increase in δ, i.e. the probability of selling the firm as a going concern in case of default. Given that $\lambda_j = \delta(1-\psi_j)$, for a given increase in δ, firms operating in districts where courts are more efficient (lower ψ_j) should benefit more from the reform in terms of access to external finance. Since now more firms can pay the fixed cost to operate the *high* technology, these districts should also experience a larger increase in investment.

Proposition 2: *An increase in λ_j raises the average wage in district j. This generates an increase in both the cutoff productivity to stay in the market (φ^*) and the cutoff productivity to adopt the high technology (φ^h).*

Proof:

$$\frac{\partial\Delta(\lambda_j)}{\partial\lambda_j} = -\frac{k}{\sigma-1}\left(\frac{\eta}{\lambda_j\gamma^{\sigma-1}}\right)^{-\frac{k}{\sigma-1}-1}\left(\frac{\eta-1}{\gamma^{\sigma-1}-1}\right)^{-\frac{k}{\sigma-1}}(\eta-1)\left[-\frac{\eta}{\lambda_j^2\gamma^{\sigma-1}}\right] > 0$$

since $\eta, \gamma, \sigma > 1$ and $\kappa > 0$.

$\frac{\partial\varphi^*}{\partial\lambda_j} > 0$ and $\frac{\partial\varphi^h}{\partial\lambda_j} > 0$ since they both have the same sign as $\frac{\partial\Delta(\lambda_j)}{\partial\lambda_j}$

Proposition 2 states that higher wages drive up both the fixed cost of entry and the fixed cost to operate the *high* technology, because both are expressed in terms of labor. When the fixed cost of entry goes up, so does the productivity cutoff for staying in the market, forcing the least productive firms to exit. When the *high* technology fixed cost goes up, so does the productivity cutoff to upgrade technology. For a given increase in δ, firms operating in districts where courts are more efficient (lower ψ_j) should experience a larger increase in both these cutoff productivities.

A3 Data

This section contains a detailed description of the main variables used in the empirical section of the paper.

A.3.1 Judicial variables

Backlog per Judge: This variable is from the *Justiça Aberta* dataset of the National Justice Council. The variables is constructed as the natural logarithm of backlog per judge. Backlog per judge is computed, for each civil court of first instance, as the ratio of the number of pending cases at the beginning of the year (variable *acervo*) divided by the total number of judges working in that court over the same year. For judicial districts that have two or more civil courts of first instance, we take a weighted average using as weights the total number of pending cases at the beginning of the year in each court. Original data can be downloaded from: `www.cnj.jus.br/corregedoria/justica_aberta/`

Potential Extra-Jurisdiction: This variable is equal to the number of neighboring municipalities that do not meet the requirements to be an independent judicial district. We compute this variable only for municipalities that are seats of a judicial district. The requirements vary by state and are reported in Table A2. In 22 out of 27 Brazilian states, the minimum requirements showed in Table A2 are *necessary* conditions to become a judicial district.[1] This is the case in the following states (identified in what follows by their state code as reported in the first column of Table A2): AC, AL, AP, BA, CE , ES, GO, MA, MG, MS, MT, PB, PE, PI, PR, RJ, RN, RO, RR, RS, SE, TO. Every municipality is the seat of a judicial district in AM and DF. The remaining states (PA, SC and SP) have more complex rules whereby municipalities need a certain number of points to become a judicial district. Points are assigned based on observable municipality characteristics. In these cases, the minimum requirements presented in Table A2 are *sufficient* conditions for a municipality to become a judicial district. Finally, four Brazilian States (AP, SC, RJ and SP) have introduced provisions to facilitate the acquisition of the status of judicial district for geographically isolated municipalities. For example, in the state of São Paulo, the minimum requirements are divided by 2 if a municipality is more than 60 km away from the seat of the nearest judicial district. These exceptions are listed in Table A2 and we adjust the minimum requirements to take them into account when computing the measure of potential extra-jurisdiction at municipality level. Finally, it should be noted that, to determine whether a municipality meets the requirement to be an independent judicial district, we rely on those municipality characteristics for which data is reported

[1] We define a necessary condition as one where the wording of the law is: "depende da satisfacao dos siguientes requisitos", "sao requisitos essenciais", "sao requisitos necessarios", "sao requisitos indispensaveis".

by the IBGE, the Brazilian Institute of Statistics.[2]

Bankruptcy Court: This variable is from the *Justiça Aberta* dataset of the National Justice Council. The variable is a dummy equal to 1 for judicial districts that have (at least) one bankruptcy court in place at the time the reform is implemented.

Years in Court: This variable is from the case-level dataset of the State Tribunal of Rio Grande do Sul (TJRS). It is constructed as the natural logarithm of the average number of years to close bankruptcy cases that entered the courts of a given district between January 2000 and May 2005 (pre-reform period). The time in court for each case is calculated as the time elapsed between the date in which the case was filed (variable "*processo distribuido*" in the original dataset) and the date in which the case was closed (variable "*processo baixado*" in the original dataset). The data is right censored: around 10% of cases started in the pre-reform period are still open as of July 2014, the last month in the dataset. The measure of average years in court is computed as the mean survival time of cases restricted to the longest duration observed in the data ("restricted" mean).

A.3.2 Financial variables

Number of secured loans per firm: Data on number of secured loans per firm is from the Credit Information System of the Central Bank of Brazil and from the Annual Industrial Survey (PIA). The Credit Information System reports information on all loans above 5000 BRL issued by Brazilian banks. The Annual Industrial Survey reports data on all manufacturing firms with at least 30 employees and on a representative sample of those with between 5 and 29 employees. The variable is calculated as the natural logarithm of the total number of secured loans originated in a given year to manufacturing firms located in a given municipality according to the Credit Information System, divided by the total number of manufacturing firms in the same municipality according to PIA.[3] The Credit Information System reports information on the type of operation financed by each loan. To compute this variable we focus on loans aimed at financing the types of investment captured by the investment variable in the Annual Industrial Survey. This includes the following types of operation (variable code in the original dataset reported in parenthesis): acquisition of machineries and equipment (402), acquisition of vehicles (401), acquisition of infrastructures (1101), import of capital goods (601), financing of

[2]While data on population, number of voters and area are available for all Brazilian municipalities, we usually do not have information on cases originated in each municipality (the dataset *Justiça Aberta* reports the number of cases that enter in each court, but not in which municipality they were originated). In these cases, we rely solely on observed characteristics to determine whether that municipality meets the minimum requirements.

[3]Firms in the manufacturing sector in this paper are identified by the codes 15 to 37 in the CNAE 1.0 sector classification. This classification is used in both the Credit Information System and the PIA.

firm projects (490, 802, 890) and leasing operations (1201, 1202 and 1290). The variable is winsorized at the 1% level.

Average value of secured loans: Data on value of loans is from the Credit Information System of the Central Bank of Brazil. The Credit Information System reports information on all loans above 5000 BRL issued by Brazilian banks. The variable is calculated as the natural logarithm of the average real value of secured loans originated in a given year to manufacturing firms located in a given municipality. The variable is computed using loans aimed at financing firm investment, which include the same set of categories indicated in the description of the variable "Number of secured loans per firm". The variable is converted in 2000 BRL using the *IGP-DI price deflator*, constructed by the Getúlio Vargas Foundation. The variable is winsorized at the 1% level.

Average interest rate on secured loans: Data on interest rates is from the Credit Information System of the Central Bank of Brazil. The Credit Information System reports information on all loans above 5000 BRL issued by Brazilian banks. The variables is calculated as the average interest rate on secured loans originated in a given year to manufacturing firms located in a given municipality. We focus on loans that have a fixed (as opposed to floating) interest rate. The variable is computed using loans aimed at financing firm investment, which include the same set of categories indicated in the description of the variable "Number of loans per firm". The variable is winsorized at the 1% level.

A.3.3 Real firm-level variables

Data on firm investment, output and labor productivity is from the Annual Industrial Survey (*PIA*, *Pesquisa Industrial Anual)*. The data is collected yearly by the IBGE and made available for research purposes in the facilities of the IBGE - Rio de Janeiro upon approval of a research proposal. Here a provide a more detailed description of each of these variables. All monetary variables have been converted in 2000 BRL using the *IGP-DI price deflator*, constructed by the Getúlio Vargas Foundation. The index is a weighted average of three indexes: wholesale prices index (IPA), consumer prices index (IPC-BR) and the national cost of civil construction index (INCC). We restrict our analysis to the manufacturing sector as defined by CNAE 1.0 sector classification (codes 15 to 37) and to the Census stratum of the survey, which includes firms with at least 30 employees and it is representative at municipality level.

Investment over assets: The variable is constructed as the total value of firm investment in a given year (code $V0080$ in the original dataset) divided by the total value of firm assets in the previous year (code $V0210$). Firm investment is the sum of firm expenditure in acquisitions from third parties of (codes in the original dataset reported in parenthesis): machineries and equipment ($V0077$), vehicles ($V0078$), land and buildings ($V0076$), and other acquisitions from third parties including expenditures in IT ($V0079$). The variable is winsorized at the 5% level.

Output: The variable is constructed as the log of gross value of production (code $X21$ in the original dataset). The variable is winsorized at the 1% level.

Labor Productivity: The variable is constructed as the log of gross value of production (code $X21$ in the original dataset) divided by the total number of workers in efficiency units. The Annual Industrial Survey records data on three categories of workers: production workers, non-production workers and owners. We use the wage ratio with respect to the average wage of production workers to construct the skill premium for non-production workers and owners. The number of workers in efficiency units is constructed as: $L = L^P + \frac{\bar{w}^{NP}}{\bar{w}^P} L^{NP} + \frac{\bar{w}^O}{\bar{w}^P} L^O$ where $\bar{w}^j$ is the average wage of category j, P identifies production workers, NP identifies non-production workers and O identifies owners. The codes of variables L^P, L^{NP} and L^O in the original dataset are, respectively: $V0005$, $V0006$ and $V0007$ (their respective wages are extracted from variables: $V0009$, $V0010$ and $V0011$). The variable is winsorized at the 5% level.

A.3.4 Controls

Income per Capita: Data on income per capita is from the Sample Supplement of the Brazilian Population Census. The Supplement reports information on income received from any source for a sample of the Brazilian population that is representative of the whole population at the municipal level. The variable is calculated as the natural logarithm of the average real monthly income of people above 10 years of age earning strictly positive income. The IBGE collects data on income coming from both labor and other sources (including pensions, social programs, rents, capital income etc). Income is defined as the sum of income coming from all sources. Original data come at the individual level: average income at the municipality level is computed using the individual weights provided by the IBGE.

Bank Branches per 100,000 inhabitants: Data on bank branches per 100,000 inhabitants is from the ESTBAN dataset of the Central Bank of Brazil and from the Brazilian Population Census. The ESTBAN dataset reports information on total number of bank branches located in a municipality. The Brazilian Census reports information on the total number of people of any age living in a municipality. The variable is constructed as the number of bank branches divided by the number of people, multiplied by 100,000.

Manufacturing Value Added Share: Data on manufacturing share in total value added at municipality level is from IPEA, the Brazilian Institute for Applied Economic Research. IPEA reports estimates of total value added, as well as its decomposition into agriculture, manufacturing and services for each Brazilian municipality. The variable is constructed as manufacturing value added divided by total value added.

Population: Data on population is from from the Brazilian Population Census. The variable is the natural logarithm of the total number of people of any age living in a municipality.

Literacy rate: Data on literacy rate is from the Sample Supplement of the Brazilian Population Census. The variable is calculated using people that are 10 years of age or older, and it is equal to the total number of people able to read and write divided by the total number of people in a municipality. Original data come at the individual level: we aggregate these data at the municipality level using the individual weights provided by the IBGE.

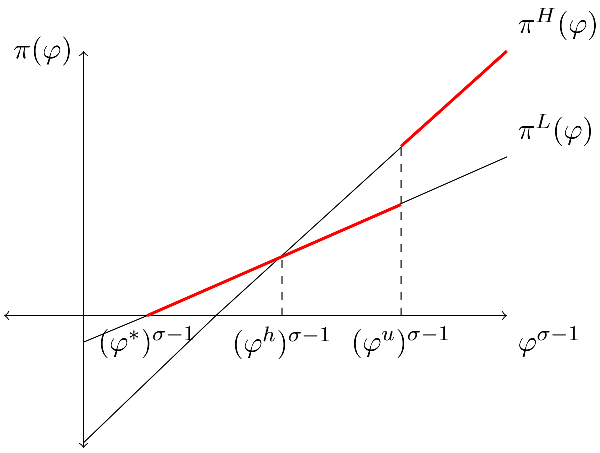
Avg Income per Capita Neighbors: The variable is defined as the natural logarithm of the average income per capita across territorially contiguous municipalities. See the description of the variable "Income per Capita" for details.

Avg Area Neighbors: Data on area of neighboring municipalities is constructed from geo-referenced maps of Brazil prepared by GADM (`http://www.gadm.org/`). The variable is calculated as the natural logarithm of the average area in square kilometers of territorially contiguous municipalities.

Avg Manufacturing Value Added Share Neighbors: The variable is defined as the average manufacturing value added share across territorially contiguous municipalities. See the description of the variable "Manufacturing Value Added Share" for details.

A4 Additional Figures and Tables

Figure A1: Profit Functions and Productivity Cutoffs



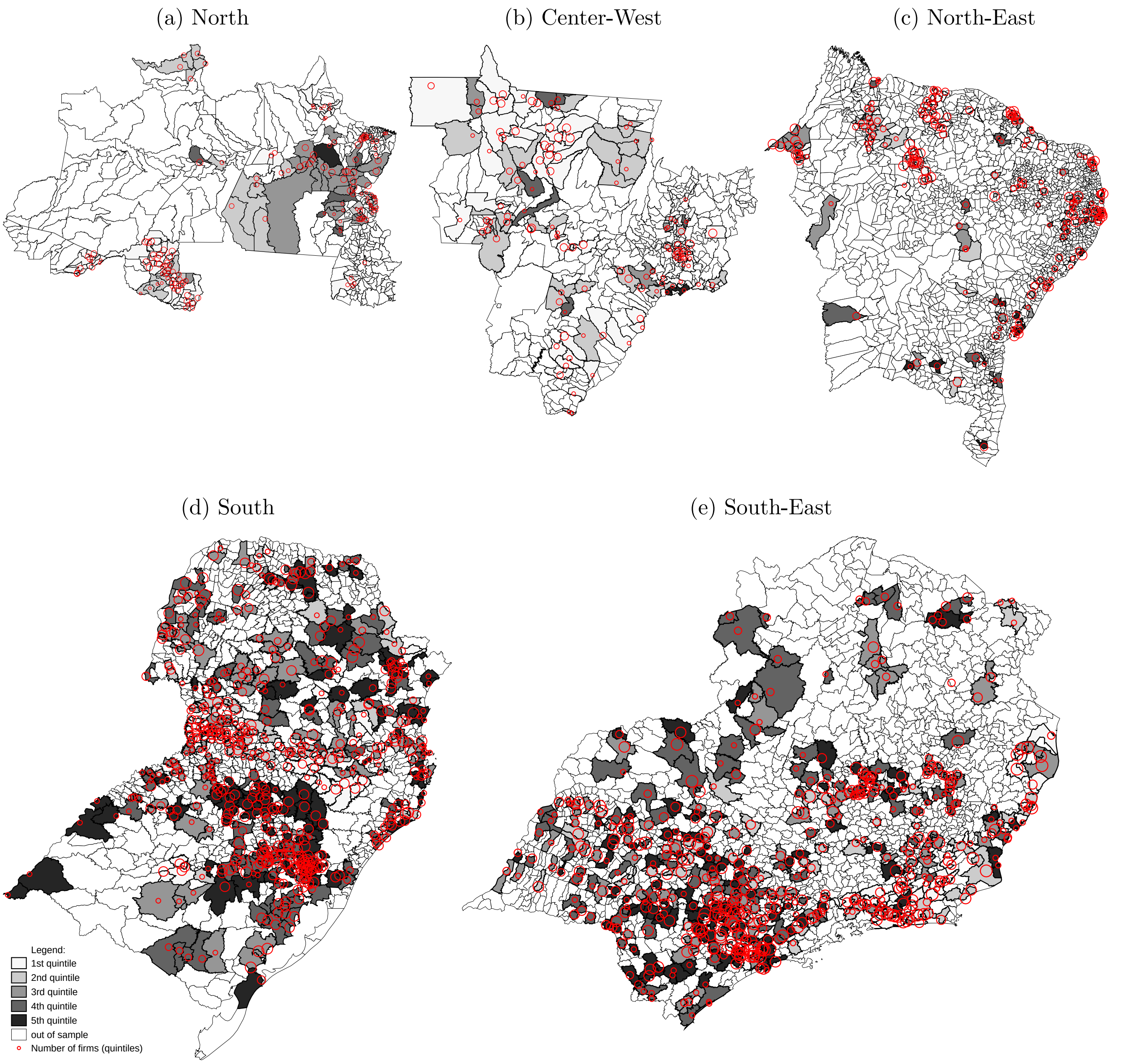
Notes: The red line indicates profits under the optimal technological choice as a function of a transformation of firm initial productivity ($\varphi^{\sigma-1}$) in the case where $\varphi^u > \varphi^h$.

Table A1: Court Congestion and Years in Court

Dependent Variable:	Log Years in Court	
	(1)	(2)
Log Backlog per Judge	0.231***	0.188***
	[0.064]	[0.048]
Log Income per Capita		-0.262**
		[0.112]
Bank Branches per 100,000 inhab.		0.000
		[0.003]
Manufacturing Value Added Share		0.065
		[0.219]
Observations	214	214
Adjusted R-squared	0.269	0.310

Notes: Observations are weighted by the number of bankruptcy cases started between January 2000 and May 2005 in each municipality. Municipality characteristics are observed in the year 2000. Robust standard errors reported in brackets. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Figure A2: Quintiles of Court Congestion and Geographical Distribution of Manufacturing Firms



Notes: Municipalities are divided in 5 quintiles based on backlog per judge in civil courts. Number of firms in each municipality is represented by red circles (5 quintiles captured by different circle size). Data is shown separately for each macro-region.

Table A2: State Laws on Judicial Organization and Minimum Requirements for Judicial Districts

State code	State name	Population	Voters	Area	Cases	Taxes	Exceptions	Law	Article	Year
AC	Acre	4,000	1,000		200	$*$		*Lei Complementar* n. 47	art 216	1995
AL	Alagoas	10,000	5,000	150	200	$*$		*Lei de Organizacao Judiciaria* n. 6564	art 125	2005
AM^+	Amazonas							*Lei Complementar* n. 17	art 9 and 10	1997
AP	Amapá	5,000					$\checkmark^1$	*Decreto* n. 0069	art 4	1991
BA	Bahia	20,000	4,000	200	200	$*$		*Lei* n. 3731	art 7	1979
CE	Ceará	10,000	2,000		100	$*$		*Lei* n. 12342	art 11	1994
ES	Espírito Santo	20,000	10,000		500	$*$		*Lei Complementar* n. 234	art 5	2002
GO	Goiás	20,000	3,000	500	150	$*$		*Lei* n. 9129	art 6	1981
MA	Maranhão	20,000	5,000					*Lei Complementar* n. 014	art 6	1991
MG	Minas Gerais	18,000	13,000		400			*Lei Complementar* n. 59	art 5	2001
MS	Mato Grosso do Sul	10,000	5,000					*Lei* n. 1511	art 14	1994
MT	Mato Grosso	10,000	3,000	1,000	500	$*$		*Lei* n. 4964	art 11	1985
PA	Pará		5,000					*Lei* n. 5008	art 10	1981
PB	Paraíba	20,000	5,000	100	200	$*$		*Lei Complementar* n. 25	art 7	1996
PE	Pernambuco	20,000	6,000		300	$*$		*Resolução* n.10		1970
PI	Piauí	10,000	1,000	40	60	$*$		*Lei* n. 3716	art 6	1979
PR	Paraná	30,000	10,000		400	$*$		*Lei Estadual* n. 14277	art 216	1980
RJ	Rio de Janeiro	15,000	8,000		200	$*$	$\checkmark^2$	*Codigo de Organizacao e Divisao Judiciarias*	art 11	1981
RN	Rio Grande do Norte	10,000	4,000		50			*Lei Complementar* n. 165	art 7	1999
RO	Rondônia	10,000	4,000		300	$*$		*Lei Complementar* n. 94	art 83	1993
RR	Roraima	8,000	4,000		200			*Lei Complementar* n. 002	art 28	1993
RS	Rio Grande do Sul	20,000	5,000		300	$*$		*Lei* n. 7356	art 3	1980
SC	Santa Caterina	20,000	6,000		150	$*$	$\checkmark^1$	*Lei* n. 5624	art 8	1979
SE	Sergipe	30,000	15,000	200	400	$*$		*Lei Complementar* n. 88	art 4	2003
SP	São Paulo		10,000				$\checkmark^3$	*Decreto-Lei Complementar* n. 3	art 12 and 13	1969
TO	Tocantins	21,000	10,500		1,200			*Lei Complementar* n. 10	art 6	1996
DF^+	Distrito Federal									

Notes: $*$: The amount of tax revenues varies by state but it is usually the same as the tax revenues required for a city to become a new municipality; $\checkmark^1$ the requirements can be reduced up to a half at the discretion of the State Tribunal in case the municipality is considered difficult to reach $\checkmark^2$ thresholds divided by four if a municipality is more than 100 km from the seat of the nearest judicial district ; $\checkmark^3$ the legal requirements are reduced by a half for municipalities that are more than 60 km away from the seat of the closest judicial district, they are multiplied by two for municipalities that are less than 15 km from the seat of the closest judicial district. $^+$: All municipalities are seats of judicial districts.

Table A3: The Effect of Court Congestion on Financial and Real Outcomes:
IV Coefficients and Standard Errors

Dependent Variables:	$\Delta \log(\frac{\text{Secured Loans}}{\text{N Firms}})$	$\Delta(\frac{\text{Investment}}{\text{Assets}})$	$\Delta \log(\text{Output})$
	(1)	(2)	(3)
Log Backlog per Judge	-0.178**	-1.607***	-0.083***
	[0.080]	[0.520]	[0.031]
Number of Neighbors	-0.010	-0.090	-0.006*
	[0.010]	[0.059]	[0.004]
Bankurptcy Court	-0.144	0.551	-0.064
	[0.124]	[0.951]	[0.065]
Log Income per Capita	0.166**	0.235	0.029
	[0.077]	[0.470]	[0.033]
Bank Branches per 100,000 inhab.	-0.004	-0.043*	-0.003
	[0.004]	[0.025]	[0.002]
Manufacturing Value Added Share	0.261	2.581*	0.192*
	[0.221]	[1.340]	[0.103]
Log Avg Income per Capita Neighbors	-0.012	1.014**	0.027
	[0.073]	[0.465]	[0.035]
Log Avg Area Neighbors	0.076***	0.183	-0.013
	[0.025]	[0.148]	[0.012]
Excluded Instrument: Potential Extra-Jurisdiction			
F-stat on First Stage:	17.54	17.54	17.54
Observations	831	831	831

Notes: Observations are weighted by the number of firms in each municipality. Changes in explanatory variables are calculated between the years before (2003-04) and the years after the reform (2005-2008) as described in section V.A. Municipality characteristics are observed in the year 2000. F-stat on the First Stage is the Angrist-Pischke first-stage F statistics. Robust standard errors reported in brackets. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table A4: The Effect of Potential Extra-Jurisdiction on Financial and Real Outcomes: Robustness of the Results in Table V and Table VI to Additional Municipality Controls

Dependent Variables:	Log Backlog per Judge			$\Delta \log(\frac{\text{Secured Loans}}{\text{N Firms}})$			$\Delta(\frac{\text{Investment}}{\text{Assets}})$			$\Delta \log(\text{Output})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Potential Extra-Jurisdiction	0.117***	0.136***	0.130***	-0.023***	-0.024***	-0.024***	-0.156***	-0.118***	-0.083*	-0.010***	-0.007**	-0.006*
	[0.026]	[0.028]	[0.029]	[0.007]	[0.008]	[0.008]	[0.036]	[0.041]	[0.045]	[0.003]	[0.003]	[0.003]
Number of Neighbors	-0.093***	-0.104***	-0.101***	0.007**	0.007*	0.007*	0.060***	0.038*	0.031	0.001	-0.001	-0.001
	[0.013]	[0.016]	[0.015]	[0.003]	[0.004]	[0.004]	[0.017]	[0.019]	[0.019]	[0.001]	[0.002]	[0.002]
Bankurptcy Court	0.305	0.247	0.225	-0.197**	-0.210**	-0.198**	0.023	0.054	0.038	-0.088*	-0.089*	-0.091*
	[0.687]	[0.688]	[0.690]	[0.087]	[0.087]	[0.094]	[0.398]	[0.387]	[0.381]	[0.047]	[0.048]	[0.049]
Log Income per Capita	-0.322	-0.729**	-0.677**	0.231***	0.145	0.115	0.602	0.763	0.821	0.058*	0.049	0.055
	[0.212]	[0.290]	[0.280]	[0.082]	[0.113]	[0.118]	[0.412]	[0.548]	[0.545]	[0.032]	[0.040]	[0.041]
Bank Branches per 100,000 inhab.	-0.009	0.008	0.006	-0.002	-0.001	-0.000	-0.027	-0.008	-0.004	-0.002	-0.000	-0.000
	[0.010]	[0.016]	[0.016]	[0.003]	[0.004]	[0.005]	[0.022]	[0.025]	[0.025]	[0.002]	[0.002]	[0.002]
Manufacturing Value Added Share	1.347***	1.279***	1.216***	0.078	0.031	0.069	-0.617	-0.289	-0.365	0.101	0.118*	0.110
	[0.418]	[0.410]	[0.435]	[0.154]	[0.151]	[0.148]	[0.820]	[0.866]	[0.853]	[0.067]	[0.069]	[0.071]
Log Avg Income per Capita Neighbors	0.673**	0.756**	0.702**	-0.124	-0.158*	-0.145*	-0.221	0.228	0.361	-0.026	0.005	0.008
	[0.294]	[0.319]	[0.331]	[0.080]	[0.087]	[0.088]	[0.357]	[0.422]	[0.407]	[0.033]	[0.038]	[0.039]
Log Avg Area Neighbors	0.081	0.084	0.163*	0.055**	0.053**	0.017	0.175	0.194*	0.180	-0.022**	-0.021**	-0.016
	[0.071]	[0.070]	[0.087]	[0.022]	[0.021]	[0.027]	[0.108]	[0.114]	[0.138]	[0.009]	[0.010]	[0.012]
Avg Manuf Value Added Share Neighbors	1.329	1.307	1.247	-0.414*	-0.429*	-0.382	1.129	1.228	1.048	-0.176	-0.171	-0.183
	[1.146]	[1.161]	[1.205]	[0.236]	[0.236]	[0.248]	[1.182]	[1.183]	[1.159]	[0.111]	[0.113]	[0.117]
Log Population		0.160**	0.160**		0.003	0.008		0.222*	0.186		0.021*	0.019*
		[0.076]	[0.071]		[0.026]	[0.027]		[0.130]	[0.131]		[0.011]	[0.011]
Literacy Rate		0.740	1.537		0.966	0.786		-0.784**	-0.976***		-0.441	-0.477*
		[1.413]	[1.442]		[0.792]	[0.812]		[0.358]	[0.359]		[0.277]	[0.283]
Distance to Coast (in km)			-0.055***			0.021**			0.049			-0.001
			[0.021]			[0.008]			[0.037]			[0.004]
Distance to State Capital (in km)			0.067*			-0.013			-0.185**			-0.004
			[0.034]			[0.016]			[0.086]			[0.007]
Observations	831	831	831	831	831	831	831	831	831	831	831	831
Adjusted R-squared	0.374	0.385	0.399	0.062	0.063	0.071	0.042	0.047	0.051	0.031	0.036	0.035

Notes: Observations are weighted by the number of firms in each municipality. Changes in explanatory variables are calculated between the years before (2003-04) and the years after the reform (2005-2008) as described in section V.A. Municipality characteristics are observed in the year 2000. Robust standard errors reported in brackets. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table A5: The Effect of Potential Extra-Jurisdiction on Firm Investment and Firm Size

Robustness to Controlling for Pre-Existing Trends

Dependent Variables:	$\Delta(\frac{\text{Investment}}{\text{Assets}})$	$\Delta \log(\text{Output})$
	(1)	(2)
Potential Extra-Jurisdiction	-0.013	0.007**
	[0.032]	[0.003]
Number of Neighbors	-0.026*	-0.002
	[0.014]	[0.001]
Bankurptcy Court	-0.711**	-0.076***
	[0.302]	[0.028]
Log Avg Income per Capita Neighbors	-0.224	0.053*
	[0.301]	[0.029]
Log Avg Area Neighbors	-0.025	0.036***
	[0.082]	[0.008]
Log Income per Capita	-0.152	-0.024
	[0.356]	[0.030]
Bank Branches per 100,000 inhab.	0.014	0.001
	[0.020]	[0.002]
Manufacturing Value Added Share	-0.757	0.100*
	[0.733]	[0.058]
Observations	807	807
Adjusted R-squared	0.000	0.073

Notes: Observations are weighted by the number of firms in each municipality. Changes in explanatory variables are calculated between the years before and the years after the placebo reform year 2003 as follows: $\Delta y_{ij} = \frac{1}{4}\sum_{t=2003}^{2004} y_{ijt} - \frac{1}{2}\sum_{t=2001}^{2002} y_{ijt}$. Then, we take an average of Δy_{ij} across firms within each municipality j and estimate the equation at municipality level. Municipality characteristics are observed in the year 2000. Robust standard errors reported in brackets. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table A6: The Effect of Potential Extra-Jurisdiction on Bank Loans, Firm Investment and Firm Size

Robustness to Spatial Correlation

Dependent Variables:	$\Delta \log(\frac{\text{Secured Loans}}{\text{N Firms}})$	$\Delta(\frac{\text{Investment}}{\text{Assets}})$	$\Delta \log(\text{Output})$
	(1)	(2)	(3)
Potential Extra-Jurisdiction	-0.019	-0.167	-0.009
Robust standard errors	(0.007)***	(0.033)***	(0.003)***
Microregion-clustered standard error	(0.007)***	(0.034)***	(0.003)***
Mesoregion-clustered standard error	(0.007)***	(0.038)***	(0.003)***
Municipality controls	Y	Y	Y
Neighboring Municipality controls	Y	Y	Y
Observations	831	831	831
Adjusted R-squared	0.057	0.042	0.026

Notes: Observations are weighted by the number of firms in each municipality. Changes in explanatory variables are calculated between the years before (2003-04) and the years after the reform (2005-2008) as described in section V.A. Municipality characteristics are observed in the year 2000. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table A7: The Effect of Potential Extra-Jurisdiction on Financial and Real Outcomes: Robustness of the Results in Table V and Table VI to Alternative Definition of Potential Extra-Jurisdiction

Dependent Variables:	$\log(\frac{\text{Backlog}}{\text{N Judges}})$	$\Delta\log(\frac{\text{Secured Loans}}{\text{N Firms}})$	$\Delta(\frac{\text{Investment}}{\text{Assets}})$	$\Delta\log(\text{Output})$
	(1)	(2)	(3)	(4)
Pot. Extra-Jurisdiction (N estblishments)	0.090***	-0.021***	-0.156***	-0.008***
	[0.030]	[0.007]	[0.032]	[0.003]
Number of Neighbors	-0.113***	0.012***	0.094***	0.003**
	[0.020]	[0.004]	[0.018]	[0.001]
Bankurptcy Court	0.323	-0.218**	-0.006	-0.093*
	[0.713]	[0.087]	[0.289]	[0.049]
Log Income per Capita	-0.215	0.209***	0.591	0.047
	[0.208]	[0.081]	[0.409]	[0.031]
Bank Branches per 100,000 inhab.	-0.009	-0.001	-0.026	-0.002
	[0.010]	[0.004]	[0.023]	[0.002]
Manufacturing Value Added Share	1.701***	-0.028	-0.122	0.053
	[0.398]	[0.141]	[0.740]	[0.067]
Log Avg Income per Capita Neighbors	0.472*	-0.104	0.238	-0.014
	[0.244]	[0.072]	[0.347]	[0.030]
Log Avg Area Neighbors	0.013	0.073***	0.159	-0.014
	[0.064]	[0.021]	[0.099]	[0.009]
Observations	831	831	831	831
Adjusted R-squared	0.346	0.060	0.039	0.025

Notes: Observations are weighted by the number of firms in each municipality. Changes in explanatory variables are calculated between the years before (2003-04) and the years after the reform (2005-2008) as described in section V.A. Municipality characteristics are observed in the year 2000. Robust standard errors reported in brackets. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.