What Does it Take to Be a Business Owner? Evidence from Transitions from Job Loss

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Introduction

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→ US: Small Business Administration, BR: Ministério do Empreendedorismo (MEMP)

→ Multilateral agencies and international organizations

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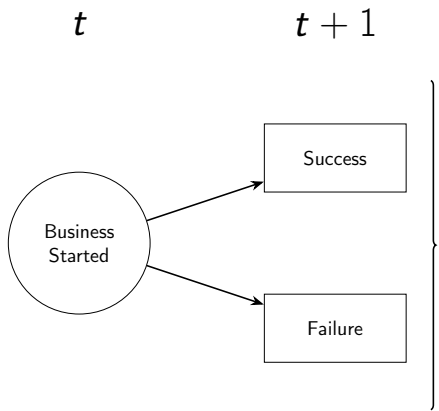
→ Many businesses **fail**: $\sim$ 50% (US BLS), $\sim$ 40% (BR RFB) after 5 years

Trajectories around Business Ownership



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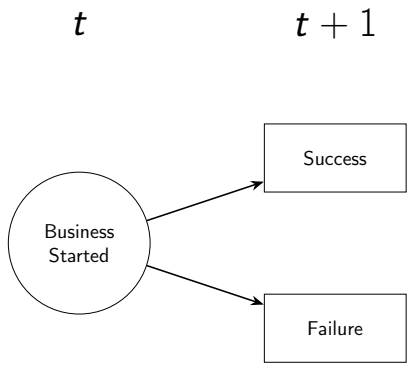

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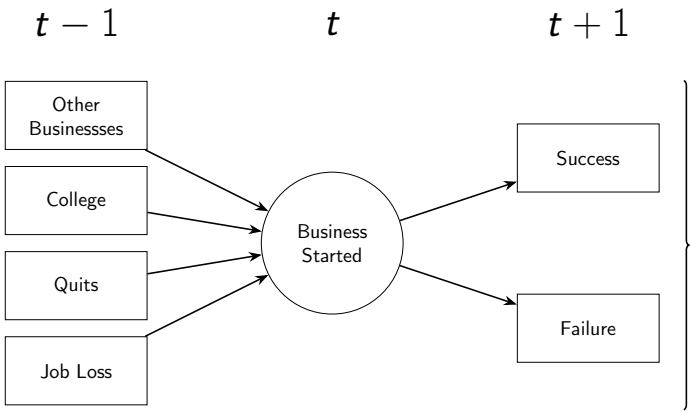

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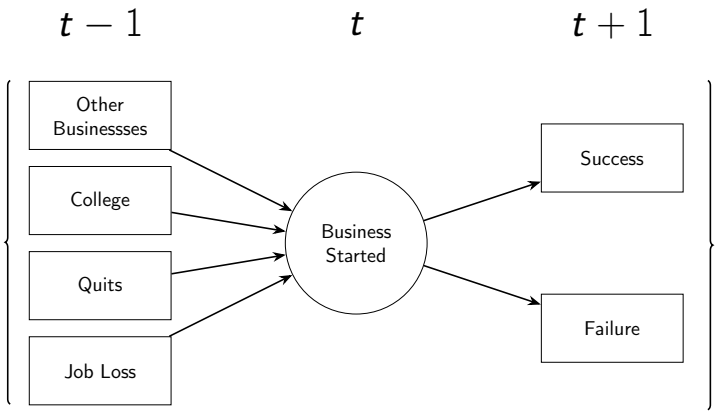

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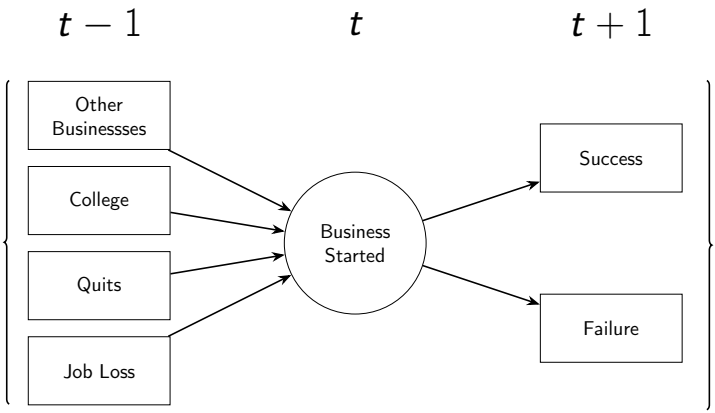

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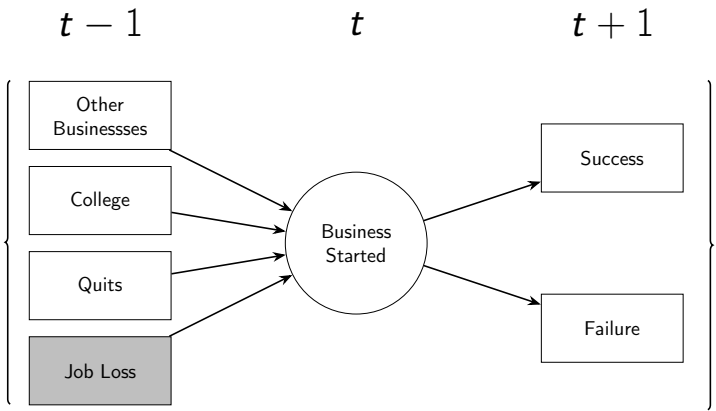

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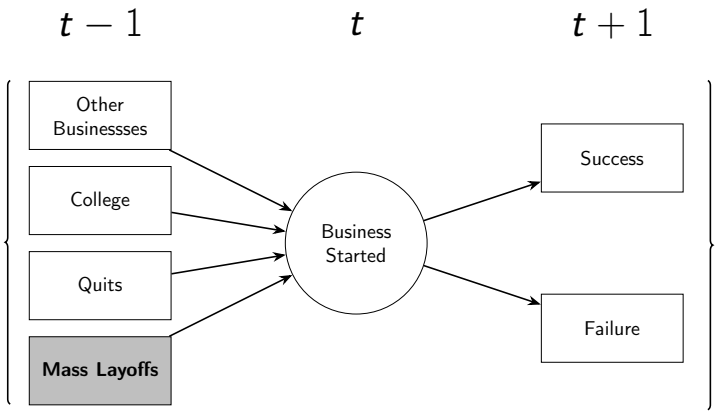

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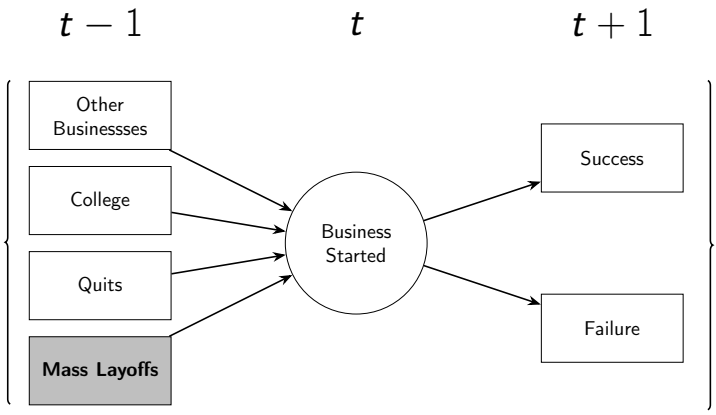

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→ Brazil: detailed **firm ownership** information + **employer-employee** matched data

- → Unusually comprehensive: self-employed workers and small business owners
- → Track individuals' trajectories for an extended period
- → Information on educational level and occupations

Preview of the Results

→ Comparing the trajectory of laid-off and matched non-laid-off ("control") individuals:

  → Positive effect of layoffs on business formation

  → Driven by **managers** and **college-educated**, **high-income** workers

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→ Focusing on businesses started by laid-off individuals:

  → Only **managerial experience** is positively correlated with business survival

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- → Focusing on businesses started by laid-off individuals:
  - → Only **managerial experience** is positively correlated with business survival
  - → Appear to leverage their industry-specific knowledge: familiar industries and growth industries
- → Benchmarking against businesses started by workers who quit:
  - → Post-layoff businesses are **just as likely** to survive as post-quit businesses
  - → Managerial experience **not correlated** with survival of post-quit businesses
  - → Unexplored entrepreneurial potential among wage-employed managers?

Literature and Contributions

→ **Business formation and survival**

Cognitive traits [Humphries '17, Levine and Rubinstein '17] **Attitude towards risk** [Levine and Rubinstein '18, Hombert et al. '20] **Motives and aspirations** [Amit and Muller '95, Schoar '10], **Economic conditions** [Hacamo and Kleiner '22, Bernstein et al. '22], **Ability** [Lucas '78, Cooper et al. '94, Lazear '04, Elfenbein et al. '10]

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→ **Businesses following job loss**

[Hombert et al. (2020), da Fonseca (2022), Nunes (2023)]

  → Heterogeneity in skills: managerial skills seem to matter, general ability not so much

  → Mechanisms: industry-specific knowledge

  → Self-employed workers and small business owners in an emerging economy

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→ **Consequences of job loss**

Negative labor market outcomes [Lachowska et al. '20, Bertheau et al. '22, Schmieder et al. '23, Scur et al. (WIP)] **Other dimensions** [Bhalotra et al. '22, Britto et al. '22, Amorim et al. '23]

- → Business ownership as an important destination
- → Potentially positive unintended consequence: individuals who would have continued in the wage sector start long-lasting businesses

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Background, Data, and Empirical Strategy

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   - → Retail (non-specialized), food/restaurants, personal services (beauty salons, pet supplies), construction, auto repair, advertisement
4. **Business owners often transitioned from the wage sector**
   - → In 56% of new businesses, owner was employed in the wage sector in the previous 2 years
   - → After firings: 32%; after quits: 13%

Brazilian Data

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→ **Quarterly panel** with employment and business ownership conditions

→ Formal sector comprises 60% of wage workers, 30% of businesses

→ This paper: analysis of **formal businesses** → More likely to grow; focus of public policies

Empirical Strategy

Mass layoffs: plausibly **exogenous to unobserved characteristics** (e.g., entrepr. ability)
[Lachowska et al. 2020, Bhalotra et al. 2021, Bertheau et al. 2022, Britto et al. 2022]

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→ Defining mass layoffs: [Schmieder et al. (AER) 2023 with quarterly data]

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→ Worker selection criteria: 20-50 years old, 2+ years of tenure

→ 11,615 **mass layoff events** between 2012q1 and 2014q4 → 294,701 **laid-off workers**

Defining the Counterfactual Sample

- → **Non-laid-off workers** ("control" workers)
- → **Matched** with laid-off workers on **pre-layoff variables**:
  - → Cells: 2-digit industry X gender
  - → Cell-specific score for the propensity that a worker is laid off:
    - – Log wages in t-8 and t-4, age in t-1, tenure in t-1, employer size in t-1, and education
- → Stacked event-by-event panel [Cengiz et al. 2019, Schmieder et al. 2023]
  - → Avoid issues usually associated with staggered treatment timing [Baker et al. 2022)

Sample Characteristics

	Non-Laid-Off			Laid-Off		
	Mean	Median	SD	Mean	Median	SD
Matching variables						
Worker: Wage in t=-8	2172.66	1542.77	2547.02	2123.92	1536.65	2183.34
Worker: Wage in t=-4	2342.57	1666.52	2686.22	2291.96	1651.05	2371.70
Worker: Age	35.01	34.00	8.02	35.09	35.00	7.98
Worker: Quarters of Tenure	17.34	13.00	13.56	17.89	13.00	14.37
Worker: Years of Education	10.21	12.00	3.26	10.12	12.00	3.34
Worker: Female	0.31	0.00	0.46	0.31	0.00	0.46
Firm: Manufacturing	0.31	0.00	0.46	0.30	0.00	0.46
Firm: Retail	0.03	0.00	0.16	0.03	0.00	0.18
Firm: Services	0.25	0.00	0.43	0.26	0.00	0.44
Firm: Other	0.42	0.00	0.49	0.41	0.00	0.49
Other variables						
Worker: Business Owner	0.03	0.00	0.17	0.03	0.00	0.17
Worker: White	0.53	1.00	0.50	0.46	0.00	0.50
Worker: Manager	0.07	0.00	0.25	0.07	0.00	0.25
Worker: Wage Premium (AKM FE)	-0.42	-0.51	0.52	-0.43	-0.53	0.53
Firm: Wage Premium (AKM FE)	0.01	-0.01	0.22	0.02	0.01	0.21
Observations	294701			294701		

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→ Comparing the trajectory of **laid-off workers** and their **counterfactual ("control") sample**

→ Outcome variable: $= 1$ if worker i opens a business in quarter t $[Open_{it}]$

→ Main coefficient: difference in the trajectory of laid-off relative to their matched counterpart $[\mu_\ell]$

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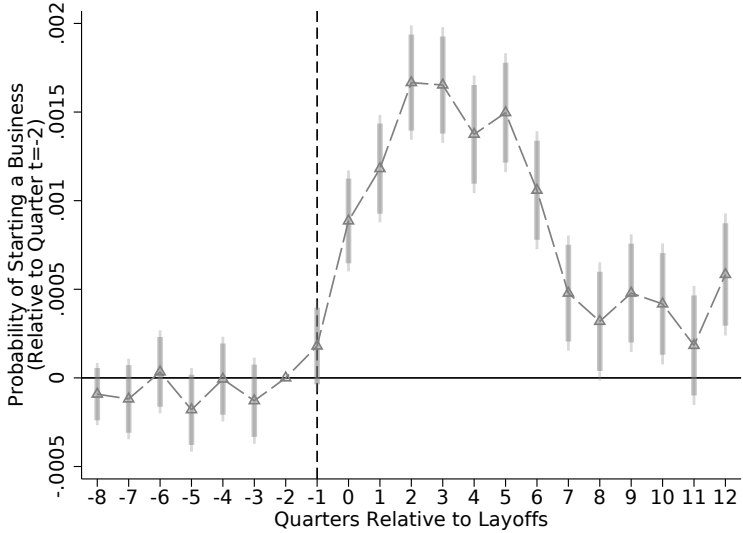
→ Event study specification: [Schmieder et al. (AER) 2023]

$$Open_{it} = \alpha + \overbrace{\sum_{\ell=-8}^{12} \mu_\ell \cdot 1 \cdot \{t - E_i = \ell\} \cdot LaidOff_i}^{\text{trajectory relative to non-laid-off workers}} + \overbrace{\sum_{\ell=-8}^{12} \gamma_\ell \cdot 1 \cdot \{t - E_i = \ell\}}^{\text{quarter relative to baseline FE}}$$

$$+ \underbrace{\beta \cdot LaidOff_i}_{\text{laid-off group FE}} + \underbrace{\phi_t}_{\text{quarter FE}} + \underbrace{X_{it}\pi}_{\text{age squared}} + \varepsilon_{it}$$

Sharp Increase in Business Ownership After Layoffs



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Individuals' skills and abilities are likely to shape the decision to start a business

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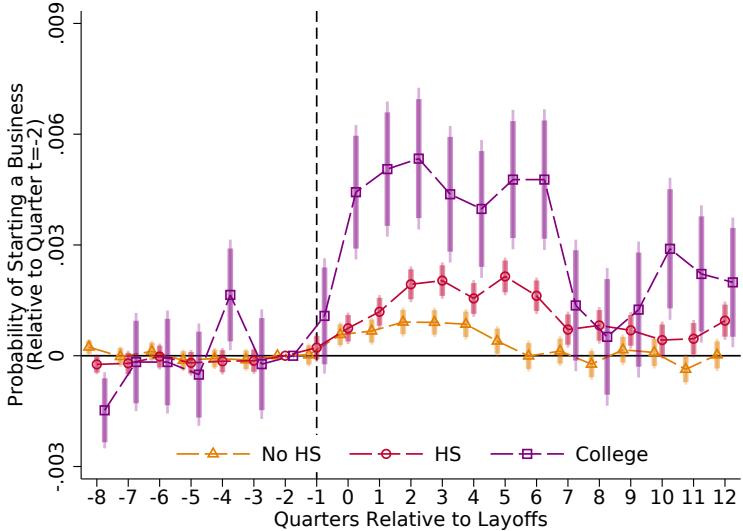
2. **Specific ability**, related to owning and operating a business
   - → **Managerial experience: occupational codes specify managers and supervisors**
   - → Exposure to good management practices: firm wage premium ("firm AKM fixed effect") highly correlated with adoption of management practices [Cornwell et al. 2021]

Transition to Business Ownership Linked to **General Ability**



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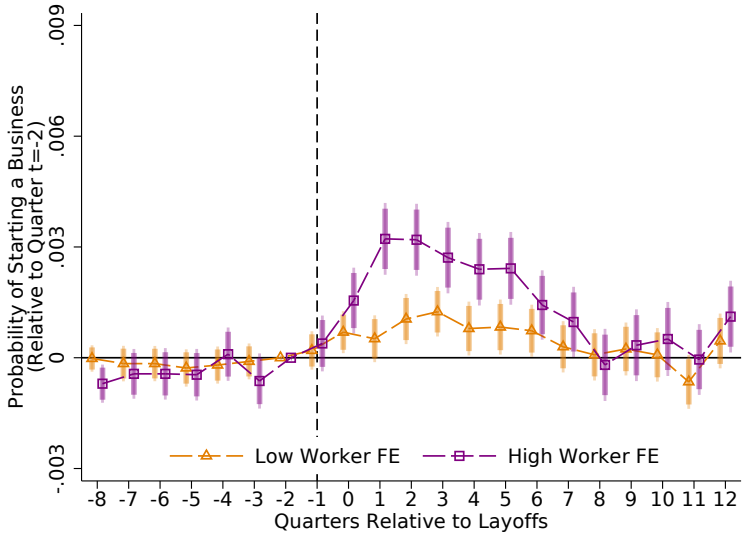

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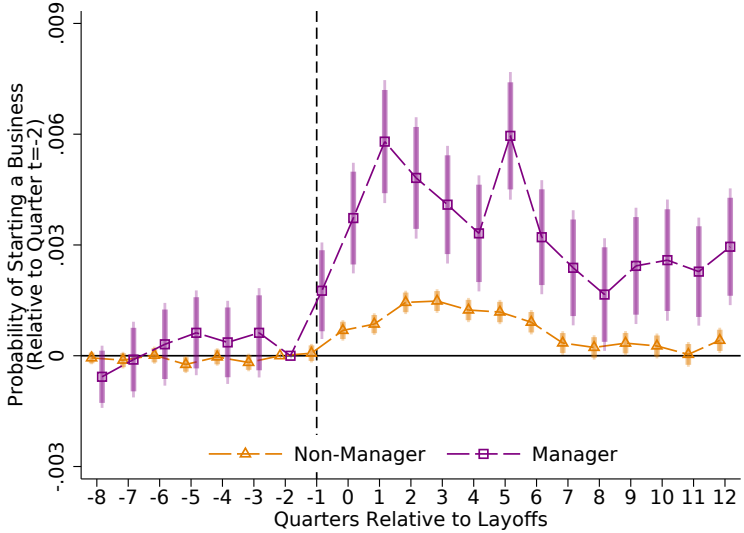

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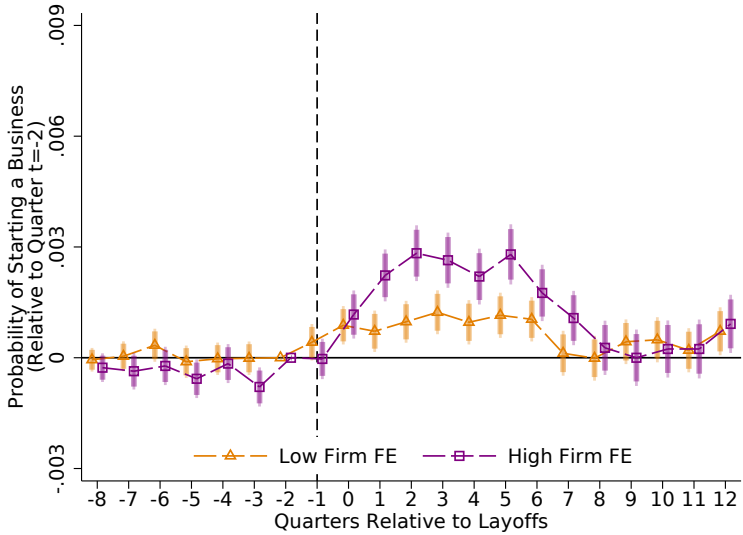

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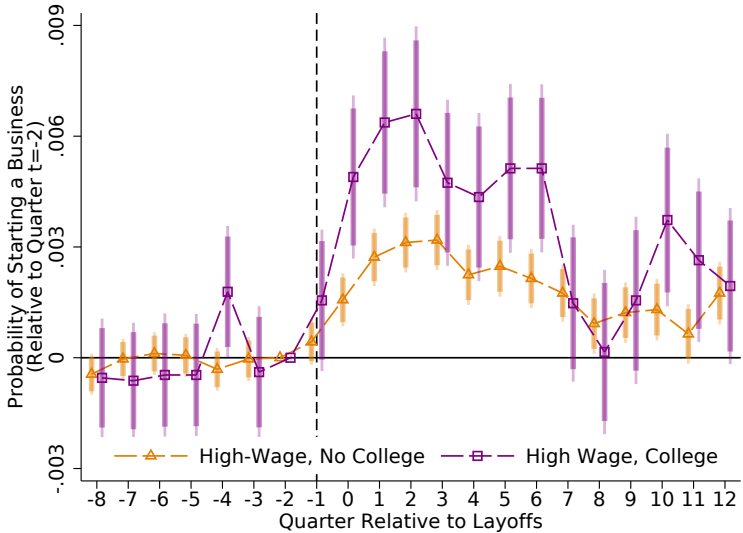
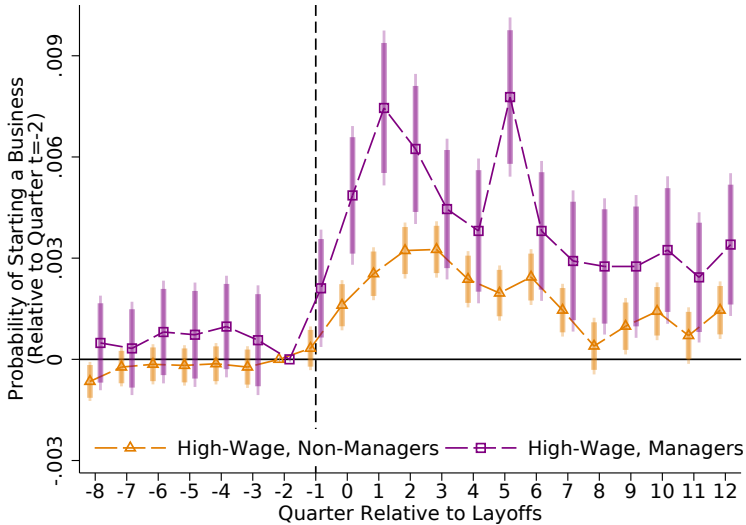


It's Not Just Wages: Skills Have an Additional Effect on Business Formation



Taking Stock and Moving Forward

→ Positive, significant effect of **layoffs on business formation**

  → Driven by workers with general (**education**) and specific (**managerial experience**) ability

  → Also driven by high-wage workers, but abilities have an additional marginal effect

    – Regression results: Appendix

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    – Regression results: Appendix

→ Are these skills **also linked with business survival**?

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  → Also driven by high-wage workers, but abilities have an additional marginal effect

    – Regression results: Appendix

→ Are these skills **also linked with business survival**?

  → No counterfactual / control group for the businesses started by workers who were laid off

  → **We can still evaluate the characteristics of long-lasting businesses**

The Determinants of Business Survival

→ Linear probability model, with **business started by laid-off workers**

→ Outcome variable: = 1 if business opened by worker i was not closed within 5 years [$Survival_i$]

$$Survival_i = \beta_0 + \overbrace{\beta_1 \cdot College_i}^{\text{general ability}} + \overbrace{\beta_2 \cdot Manager_i}^{\text{specific ability}} + \overbrace{\beta_3 \cdot Ln(Wage)_i}^{\text{pre-layoff wages}}$$

$$+ \underbrace{\beta X_i}_{\text{gender, race}} + \underbrace{\delta_t + \delta_j + \delta_s}_{\text{FE: layoff quarter, industry, state}} + \varepsilon_i$$

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Goal: Explore empirical correlations!

Specification **does not** recover the causal effect of ability/wages on business survival

Managers ⇑ Likely to **Survive as Business Owners**

	P(5-Year Survival)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	0.018	0.022*					-0.010	**0.012**
	(0.012)	(0.013)					(0.014)	**(0.014)**
Managerial Experience			0.065***	0.057***			0.052***	**0.053*** **
			(0.012)	(0.013)			(0.013)	**(0.013)**
Ln(Wage) in $\ell = -1$					0.026***	0.015**	0.021***	**0.004**
					(0.006)	(0.006)	(0.007)	**(0.008)**
Average LHS	0.602	0.602	0.602	0.602	0.602	0.602	0.602	0.602
Observations	12844	12844	12844	12844	12844	12844	12844	12844
R-Squared	0.000	0.035	0.002	0.036	0.002	0.035	0.003	0.036
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Layoff Quarter FE		✓		✓		✓		✓

Also ⇓ Likely to **Return to Wage Job**

	P(Return to Wage Employment)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	0.037***	0.045***					0.040***	**0.043*** **
	(0.012)	(0.013)					(0.014)	**(0.014)**
Managerial Experience			-0.036***	-0.022*			-0.044***	**-0.033** **
			(0.013)	(0.013)			(0.013)	**(0.013)**
Ln(Wage) in $\ell = -1$					0.006	0.012*	0.003	**0.007**
					(0.006)	(0.007)	(0.007)	**(0.008)**
Average LHS	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610
Observations	12844	12844	12844	12844	12844	12844	12844	12844
R-Squared	0.001	0.036	0.001	0.036	0.000	0.036	0.002	0.037
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Layoff Quarter FE		✓		✓		✓		✓

Why Are Business Started by Managers More Likely to Survive?

Mechanism 1. Industry Choice

→ Managers are business-savvy and possess industry-specific information they can leverage when starting their own businesses

[Lucas 1978, Cooper et al. 1994, Lazear 2004, Elfenbein et al. 2010]

Mechanism 2. Outside Options

→ Managers are less likely to find a good job and might be locked in their businesses

[Amit and Muller 1995, Berglann et al. 2011, Dal-Ri et al. WP]

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→ Do managers start their businesses in the **same 2-digit industry** they worked in $\ell = -1$?

→ Do managers start their businesses in **growth industries**? ($\uparrow$ 10% # firms year over year)

$$SameInd_i \text{ or } GrowthInd_i = \beta_0 + \overbrace{\beta_1 \cdot College_i}^{\text{general ability}} + \overbrace{\beta_2 \cdot Manager_i}^{\text{specific ability}} + \overbrace{\beta_3 \cdot Ln(Wage)_i}^{\text{pre-layoff wages}}$$

$$+ \underbrace{\beta X_i}_{\text{gender, race}} + \underbrace{\delta_t + \delta_j + \delta_s}_{\text{FE: layoff quarter, industry, state}} + \varepsilon_i$$

Managers ⇑ Likely to Choose Familiar or Growth Industries

	P(Same Industry | Starting a Business)				P(Growth Industry | Starting a Business)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	-0.005			**-0.018**	-0.010			**-0.009**
	(0.010)			**(0.011)**	(0.011)			**(0.012)**
Managerial Experience		0.058***		**0.057*** **		0.025**		**0.030** **
		(0.011)		**(0.012)**		(0.012)		**(0.012)**
Ln(Wage) in $\ell = -1$			0.010*	**0.005**			-0.003	**-0.006**
			(0.005)	**(0.006)**			(0.006)	**(0.007)**
Average LHS	0.191	0.191	0.191	0.191	0.270	0.270	0.270	0.270
Observations	12844	12844	12844	12844	12844	12844	12844	12844
R-Squared	0.071	0.074	0.072	0.074	0.058	0.059	0.058	0.059
Worker Controls	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓
Layoff Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓

Operating in a Familiar Industry is Linked with ⇑ Survival

	P(5-Year Survival)							
	(1) All	(2) All	(3) Cllg	(4) Cllg	(5) Mgr	(6) Mgr	(7) HghWg	(8) HghWg
Same Industry	**0.068*** (0.011)**		0.058* (0.030)		**0.086*** (0.028)**		0.078*** (0.021)	
Growth Industry		**0.019* (0.010)**		-0.018 (0.027)		**0.027 (0.026)**		0.020 (0.019)
Average LHS	0.602	0.602	0.618	0.618	0.658	0.658	0.633	0.633
Observations	12844	12844	1850	1850	1707	1707	3211	3211
R-Squared	0.016	0.013	0.052	0.050	0.041	0.036	0.035	0.031
Worker Controls	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓

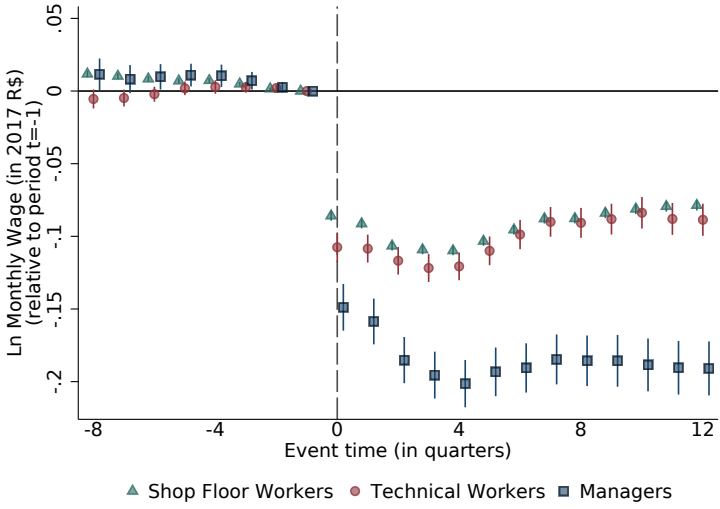
Why Are Businesses Started by Managers More Likely to Survive?

Mechanism 2. Outside Options

→ Managers are less likely to find a good job and might be locked in as business owners
[Amit and Muller 1995, Berglann et al. 2011, Dal-Ri et al. WP]

Initial Motivation

Displacement Events and Job-Driven Scarring – *work with D. Scur and I. Schmutte*



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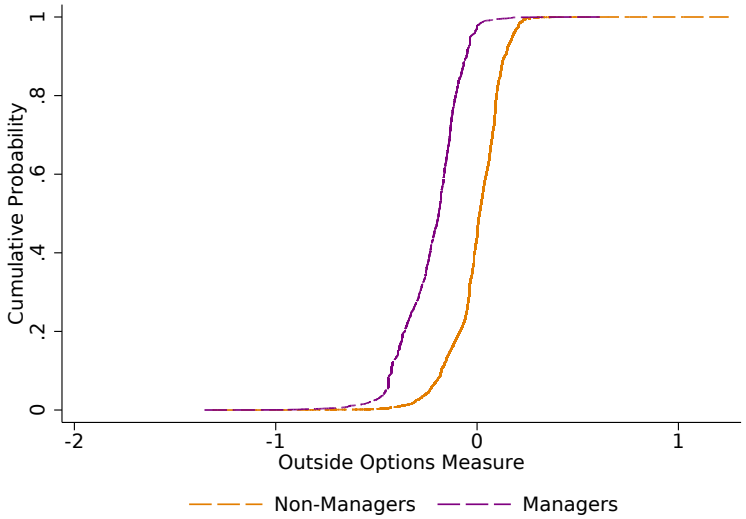
→ Calculate "**outside options measure**"

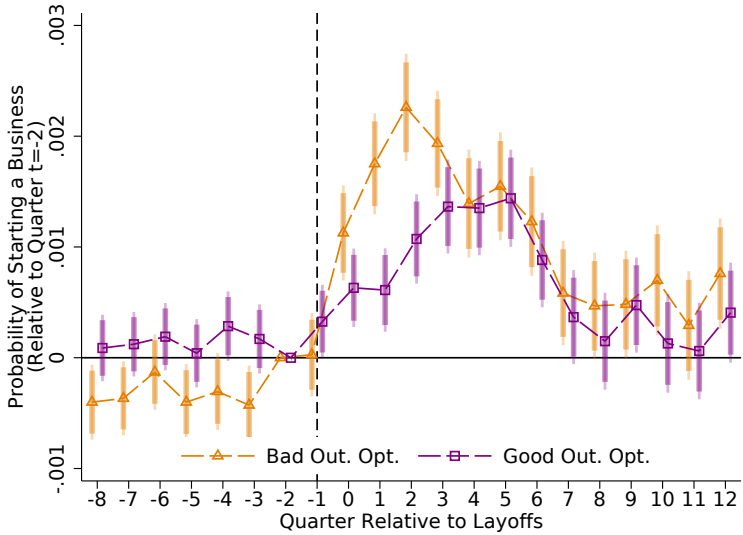
1. Estimate occupation-industry-specific wage premiums
2. Calculate transition probability b/w occupation-industry pairs
3. Outside option:

$$\text{Outside Option} = \text{Expected wage premium (weighted by transition probability)} - \text{Current wage premium}$$

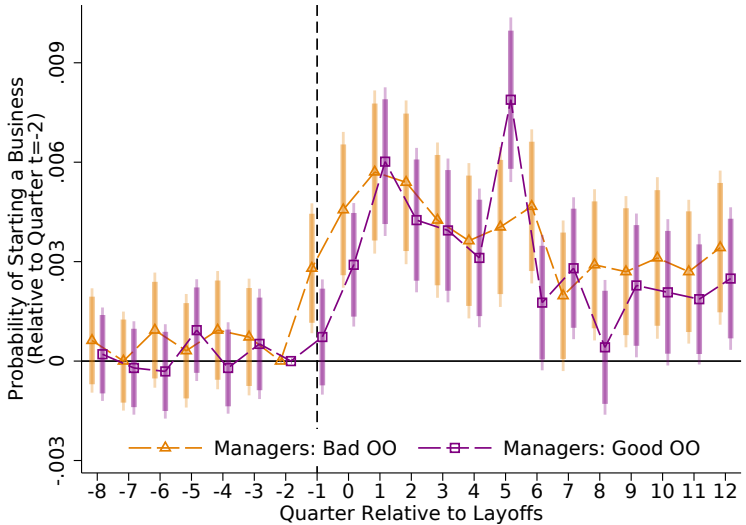
Outside Options: Managers Have It Worse



Worse Options: ⇑ **Business Formation** (And Faster)



Weak Link Between Outside Options and Business Formation for Managers



And Outside Options Do Not Correlate with Survival among Managers

	P(5-Year Survival)							
	(1) All	(2) All	(3) Cllg	(4) Cllg	(5) Mgr	(6) Mgr	(7) HghWg	(8) HghWg
Outside Option	-0.083***	-0.020	-0.167***	-0.110*	-0.133*	-0.055	-0.015	-0.003
	(0.027)	(0.030)	(0.059)	(0.067)	(0.072)	(0.084)	(0.049)	(0.053)
Average LHS	0.602	0.602	0.616	0.616	0.658	0.658	0.633	0.633
Observations	12845	12845	1853	1853	1709	1709	3211	3211
R-Squared	0.001	0.034	0.004	0.067	0.002	0.054	0.000	0.036
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Quarter FE		✓		✓		✓		✓

What Have We Learned?

→ Positive, significant effect of **layoffs on business formation**

- → Driven by workers with general (**education**) and specific (**managerial experience**) ability
- → It's not just wages: skills have an additional effect

→ **Managerial experience** is correlated with **longer-lasting** businesses

- ⇓ likely to go **back to wage employment**
- ⇑ likely to operate in **familiar industries** → Longer-lasting businesses
- ⇑ likely to operate in **growth industries** → No correlation with survival
- Outside options are not particularly relevant for business formation or survival

→ Other potential mechanisms: Access to financial resources? Networking? Amenities?

Benchmarking: Comparison with Post-Quit Businesses

Identifying Post-Quit Businesses

- → Leverage reported **cause of separation** in RAIS data set
- → Similar to businesses started by laid-off workers
  - → Quitting from firms with 50+ employees
  - → Workers between 20-50 years old
  - → 2+ years of tenure
- → 574,334 workers who quit between 2012q1 and 2014q4
  - → Who start 38,585 businesses

Business Survival: Layoffs or Quits?

→ Compare businesses started by **laid-off workers** to those started by **workers who quit their jobs**

→ Outcome variable: $= 1$ if business opened by worker i was not closed within 5 years [$Survival_i$]

→ Main coefficient: difference in the survival of post-layoff and post-quit businesses [β_1]

$$Survival_i = \beta_0 + \beta_1 \cdot LaidOff_i + \underbrace{\beta X_i}_{\text{gender, race}} + \underbrace{\delta_t + \delta_j + \delta_s}_{\text{FE: layoff quarter, industry, state}} + \varepsilon_i$$

Identical Survival; Quits: Managerial Experience **Not** Significant

	P(5-Year Survival)					
	(1)	(2)	(3)	(4)	(5)	(6)
Laid-Off Owner	**0.002**	**0.002**				
	(0.005)	**(0.006)**				
College Degree			0.063***			0.017**
			(0.006)			(0.007)
Managerial Experience				0.043***		0.001
				(0.007)		(0.008)
Ln(Wage) in $\ell = -1$					0.054***	0.048***
					(0.003)	(0.004)
Average LHS	0.601	0.601	0.601	0.601	0.601	0.601
Observations	51429	51429	38585	38585	38585	38585
R-Squared	0.000	0.018	0.021	0.018	0.025	0.025
Worker Controls		✓	✓	✓	✓	✓
Fixed Effects		✓	✓	✓	✓	✓
Sample	**Pooled**	**Pooled**	**Quits**	**Quits**	**Quits**	**Quits**

Identical Survival; Quits: Managerial Experience **Not** Significant

	P(5-Year Survival)					
	(1)	(2)	(3)	(4)	(5)	(6)
Laid-Off Owner	0.002	0.002				
	(0.005)	(0.006)				
College Degree			0.063***			0.017**
			(0.006)			(0.007)
Managerial Experience				0.043***		**0.001**
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Ln(Wage) in $\ell = -1$					0.054***	0.048***
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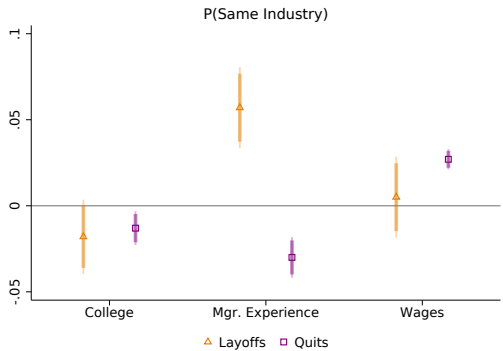
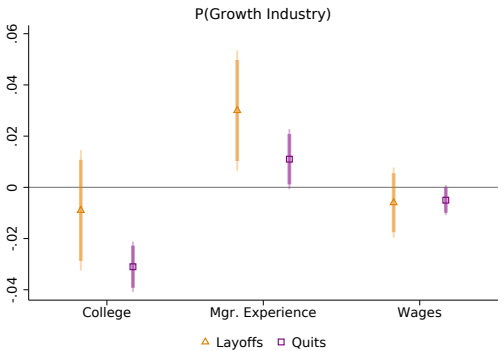
Observations	51429	51429	38585	38585	38585	38585
R-Squared	0.000	0.018	0.021	0.018	0.025	0.025
Worker Controls		✓	✓	✓	✓	✓
Fixed Effects		✓	✓	✓	✓	✓
Sample	**Pooled**	**Pooled**	**Quits**	**Quits**	**Quits**	**Quits**

Different Motive? Evidence from Industry Choice





Concluding Remarks

Main Findings

→ This paper: examine the **determinants** of business formation and survival, focusing on the relationship between **owners' skills and business outcomes**

→ General and specific ability correlate with business formation; only specific ability (managerial experience) linked with survival

  → Industry choice appears to be the key mechanism

→ Survival rate is similar between post-layoff and post-quit business, but the skills that correlate with survival are different

Implications

→ Important to disentangle pathways → Relationship between managerial experience and business survival **would have been overlooked**

→ **Targeted support** (e.g. business training) may be relevant for the "average worker" / laid-off ones

→ Less relevant for entrepreneurs who quit their jobs → More likely driven by intrinsic motivation

→ Suggestive evidence: **entrepreneurial potential among skilled wage-employed individuals**, but they might not start a business unless they are shocked into making this decision

→ Welfare implications: are these workers **better off** as business owners?

What Does It Take to Be a Business Owner? Evidence from Transitions from Job Loss

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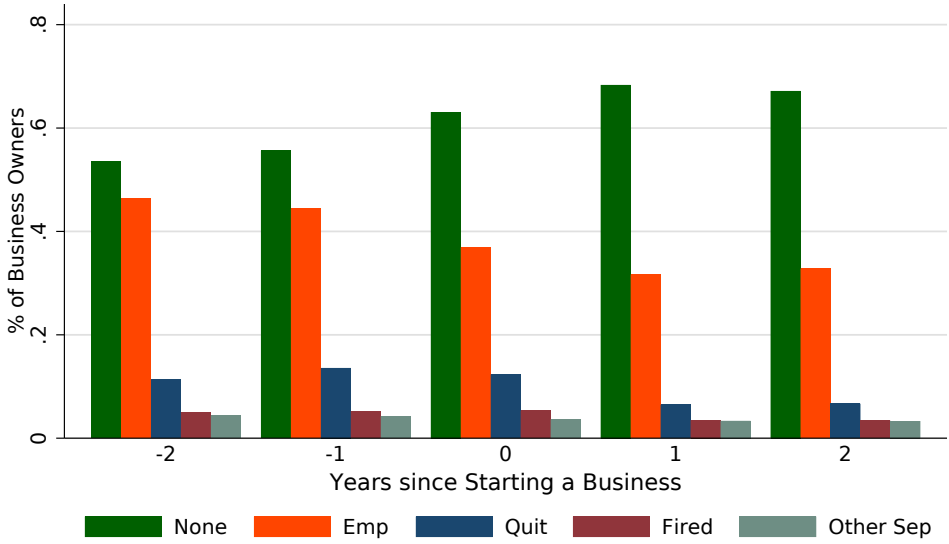
Appendix

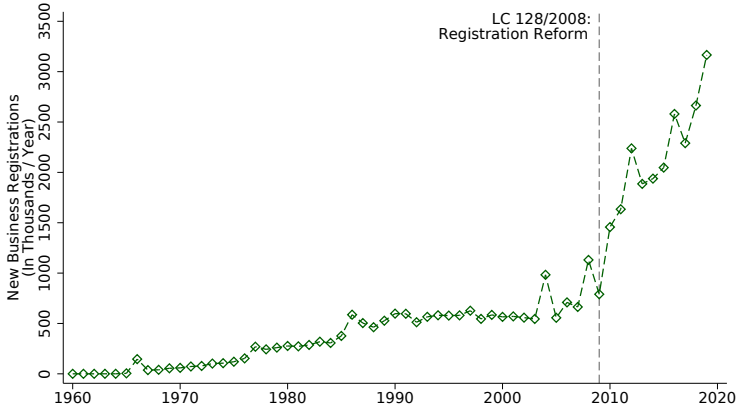
Worker Wage Premium: Quits vs. Firings

Back

Owners History



Firm Openings in Brazil



Business Registration Reform: MEI

- Following **business registration reform** in 2009 $\rightarrow$ New type of firm
  - *Micro-Empreendedor Individual* (MEI), with at most 0/1 employees
- Changes after the reform:
  - $\Downarrow$ registration costs: **online application**; no fees
  - $\Downarrow$ maintenance costs: **flat rate** taxes; few reporting reqs.; no accountant
  - $\Uparrow$ **SS benefits**: maternity/sick leave; contribution to pension system
- Other **perceived benefits**: issue invoices/sell to other firms; abide to regulations; access banking system.
- **10M** new **registered business** between 2009 and 2017

Business Registration Reform

- Up to 1 employee other than the business owner.
  - But 98.6% of MEI firms have no employees.
- Revenue limit: R$60,000/year from 2011 to 2017.
  - $\sim$ 2x (employees) or $\sim$ 2.5x (self-employed) yearly income.
- Owner cannot own other firms, but is allowed to simultaneously hold a formal job as an employee in another company.
- Allowed to operate in some industries/occupations only: manual skills; college degree nor required.
  - Hairdressers, construction workers, admin assistants, advertisers, photographers, gardeners, etc.

Business Registration Reform

- Smaller formalization costs (monetary and non-monetary).
  - Online; most firms expected to operate after filling out a single form.
    - Usual time to start a business in Brazil stood at 83 days [WB (2013)].
  - Low flat tax rate charged monthly ($\sim$5% of the minimum wage, or $\sim$\$10), including social security contributions.
    - Formal employees: social security tax rate starting at 7.5%.

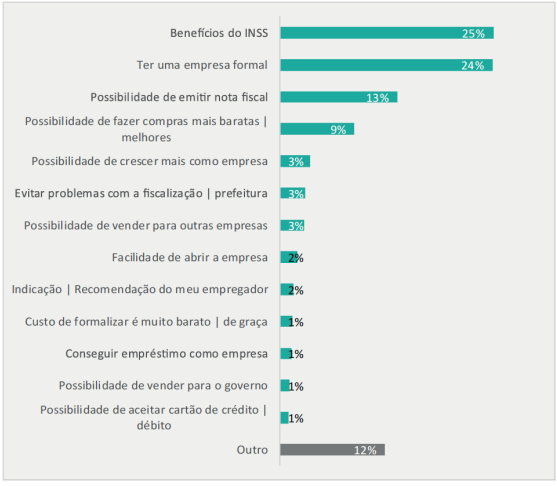
- Perceived benefits: **SS benefits**; issue invoices/sell to other firms; abide to regulations; access banking system.

- Potential barriers not addressed: online registration; keeping up with taxes & forms; capital requirements; **operating a business**.

Business Registration Reform

Back

Gráfico 61 – Principais motivos para formalização.



Fonte: Sebrae.

Record Linkage

- → MEI firms: owners' full name and CPF
  - → Exact match with RAIS
- → Other firms: owners' full name and 6 digits from the CPF
  - → Probabilistic match with RAIS
- → Matching strategy: use MEI ownership data to calibrate the algorithm, aiming to minimize false negatives and false positives
- → Stata command: reclink (bigram string comparator)
- → Algorithm:
  - → Require 6 digits to match
  - → Compare initial, first name, and full name
  - → Assign more weight for full name matches
  - → Similarity score above .95 (default is .6)

Record Linkage

→ Testing the algorithm using the MEI ownership data: accurate matching (name changes after marriage, acronyms, partial names)

→ Performance is worse with more popular names (Maria, Joao, Silva, Souza)

result	Freq.	Percent	Cum.
True Negative	82,992,094	84.87	84.87
False Positive	180,153	0.18	85.05
False Negative	100,828	0.10	85.15
True Positive	14,518,015	14.85	100.00
Total	97,791,090	100.00	

Back

Wage Effect or Ability?

→ Wages positively correlated with skills and ability measures: **potential confounder** Appendix: ES

Wage Effect or Ability?

→ Wages positively correlated with skills and ability measures: **potential confounder** Appendix: ES

→ Linear probability model: jointly estimate the effect of wages and ability measures

→ Sample of laid-off workers only

→ Outcome variable: equal to 1 if worker i opens a business **within 3 years** of job loss [$Open_i$]

$$Open_i = \beta_0 + \overbrace{\beta_1 \cdot College_i}^{\text{general ability}} + \overbrace{\beta_2 \cdot Manager_i}^{\text{specific ability}} + \overbrace{\beta_3 \cdot Ln(Wage)_i}^{\text{pre-layoff wages}}$$

$$+ \underbrace{\beta X_i}_{\text{gender, race}} + \underbrace{\delta_t + \delta_j + \delta_s}_{\text{FE: layoff quarter, industry, state}} + \varepsilon_i$$

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Goal: Explore empirical correlations!

Specification **does not** recover the causal effect of ability/wages on business ownership decisions

Ability and Wages Linked to Business Ownership

	Prob(Start a Business After Job Loss)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	**0.060*** (0.002)**	**0.055*** (0.002)**					0.039*** (0.002)	0.035*** (0.002)
Managerial Experience			0.045*** (0.002)	0.040*** (0.002)			0.021*** (0.002)	0.020*** (0.002)
Ln(Wage) in $\ell = -1$					0.033*** (0.001)	0.033*** (0.001)	0.024*** (0.001)	0.023*** (0.001)
Average LHS	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
Observations	294701	294701	294701	294701	294701	294701	294701	294701
R-Squared	0.007	0.013	0.003	0.010	0.010	0.016	0.014	0.018
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Layoff Quarter FE		✓		✓		✓		✓

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Ability and Wages Linked to Business Ownership

	Prob(Start a Business After Job Loss)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	0.060***	0.055***					0.039***	0.035***
	(0.002)	(0.002)					(0.002)	(0.002)
Managerial Experience			**0.045*** **	**0.040*** **			0.021***	0.020***
			(0.002)	**(0.002)**			(0.002)	(0.002)
Ln(Wage) in $\ell = -1$					0.033***	0.033***	0.024***	0.023***
					(0.001)	(0.001)	(0.001)	(0.001)
Average LHS	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
Observations	294701	294701	294701	294701	294701	294701	294701	294701
R-Squared	0.007	0.013	0.003	0.010	0.010	0.016	0.014	0.018
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Layoff Quarter FE		✓		✓		✓		✓

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Ability and Wages Linked to Business Ownership

	Prob(Start a Business After Job Loss)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	0.060*** (0.002)	0.055*** (0.002)					0.039*** (0.002)	0.035*** (0.002)
Managerial Experience			0.045*** (0.002)	0.040*** (0.002)			0.021*** (0.002)	0.020*** (0.002)
Ln(Wage) in $\ell = -1$					**0.033*** (0.001)**	**0.033*** (0.001)**	0.024*** (0.001)	0.023*** (0.001)
Average LHS	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
Observations	294701	294701	294701	294701	294701	294701	294701	294701
R-Squared	0.007	0.013	0.003	0.010	0.010	0.016	0.014	0.018
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Layoff Quarter FE		✓		✓		✓		✓

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Ability and Wages Linked to Business Ownership

	Prob(Start a Business After Job Loss)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College Degree	0.060*** (0.002)	0.055*** (0.002)					**0.039*** (0.002)**	**0.035*** (0.002)**
Managerial Experience			0.045*** (0.002)	0.040*** (0.002)			**0.021*** (0.002)**	**0.020*** (0.002)**
Ln(Wage) in $\ell = -1$					0.033*** (0.001)	0.033*** (0.001)	**0.024*** (0.001)**	**0.023*** (0.001)**
Average LHS	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
Observations	294701	294701	294701	294701	294701	294701	294701	294701
R-Squared	0.007	0.013	0.003	0.010	0.010	0.016	0.014	0.018
Worker Controls		✓		✓		✓		✓
Industry FE		✓		✓		✓		✓
State FE		✓		✓		✓		✓
Layoff Quarter FE		✓		✓		✓		✓

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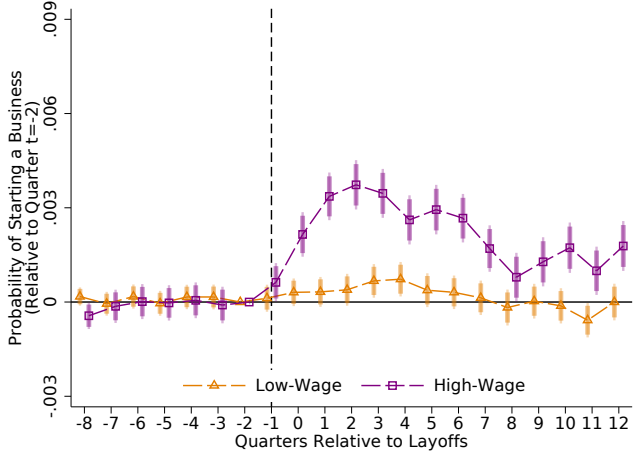
High-Wage Workers Are More Likely to Start a Business



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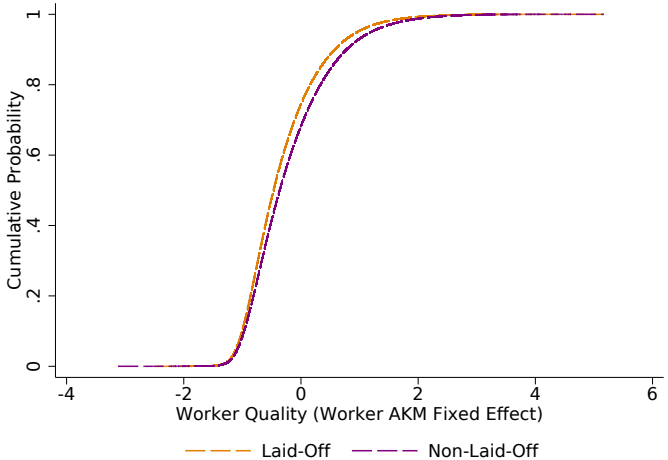
Worker Quality



Layoff Firms: All Workers

From "Displacement Events and Job-Driven Scarring"

	Displaced (in sample)			Displaced (not in sample)			Non-displaced		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Outcome variables									
Ln Monthly Wage (in 2017 R)	7.57	7.43	0.67	7.43	7.31	0.66	7.52	7.39	0.69
Monthly Income (in 2017 R)	2612.75	1690.12	3361.87	2246.36	1488.26	2808.04	2511.55	1616.28	3251.00
Probability of Employment	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Matching variables									
Worker: Age	34.39	34.00	7.91	33.72	31.00	11.11	35.40	34.00	11.12
Job: Months of Tenure	55.50	41.90	39.88	17.17	8.90	30.88	35.16	20.90	43.99
Worker: Years of Education	9.88	10.00	3.35	9.08	10.00	3.67	9.62	10.00	3.71
Worker: Female	0.25	0.00	0.43	0.20	0.00	0.40	0.22	0.00	0.41
Worker: Wage in t=-8	2050.13	1464.70	2163.69	2122.88	1405.65	2656.76	2398.48	1530.88	3105.69
Worker: Wage in t=-4	2242.73	1589.69	2423.61	2186.95	1462.15	2768.97	2498.02	1599.43	3264.17
Firm: Number of Employees	736.93	295.00	1154.47	1102.92	492.00	1658.38	1064.19	449.00	1500.10
Firm: Manufacturing	0.36	0.00	0.48	0.23	0.00	0.42	0.25	0.00	0.43
Firm: Services and Retail	0.24	0.00	0.43	0.21	0.00	0.41	0.21	0.00	0.41
Firm: Other	0.40	0.00	0.49	0.57	1.00	0.50	0.55	1.00	0.50
Other variables									
Worker: White	0.52	1.00	0.50	0.41	0.00	0.49	0.44	0.00	0.50
Observations	307567			1837673			1443578		

Layoff Firms: Managers

From "Displacement Events and Job-Driven Scarring"

	Displaced (in sample)			Displaced (not in sample)			Non-displaced		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Outcome variables									
Ln Monthly Wage (in 2017 R)	8.22	8.11	0.80	8.33	8.31	0.84	8.36	8.30	0.82
Monthly Income (in 2017 R)	5405.64	3341.03	6693.85	6045.93	4054.38	6778.54	6205.34	4011.04	7269.24
Probability of Employment	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Matching variables									
Worker: Age	36.12	36.00	7.53	40.07	39.00	11.42	40.19	39.00	10.72
Job: Months of Tenure	64.56	46.90	50.57	29.46	15.10	47.53	51.92	31.50	59.61
Worker: Years of Education	11.20	12.00	3.36	10.84	12.00	3.63	11.23	12.00	3.72
Worker: Female	0.22	0.00	0.42	0.13	0.00	0.34	0.16	0.00	0.37
Worker: Wage in t=-8	4178.42	2633.38	5150.88	5142.67	3273.55	6117.08	5357.80	3299.71	6588.17
Worker: Wage in t=-4	4673.47	2976.24	5641.22	5542.74	3661.48	6493.87	5810.37	3677.35	7044.84
Firm: Number of Employees	723.50	247.00	1162.61	968.29	385.00	1419.57	939.65	362.00	1393.56
Firm: Manufacturing	0.28	0.00	0.45	0.18	0.00	0.38	0.22	0.00	0.42
Firm: Services and Retail	0.24	0.00	0.43	0.19	0.00	0.40	0.17	0.00	0.38
Firm: Other	0.48	0.00	0.50	0.63	1.00	0.48	0.60	1.00	0.49
Other variables									
Worker: White	0.58	1.00	0.49	0.49	0.00	0.50	0.54	1.00	0.50
Observations	20682			68663			97748		

Layoff Firms: Technical Workers

From "Displacement Events and Job-Driven Scarring"

	Displaced (in sample)			Displaced (not in sample)			Non-displaced		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Outcome variables									
Ln Monthly Wage (in 2017 R)	8.15	8.09	0.78	7.96	7.85	0.89	8.18	8.15	0.83
Monthly Income (in 2017 R)	4814.38	3255.63	4939.12	4446.62	2557.16	5311.39	5100.43	3453.54	5220.28
Probability of Employment	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Matching variables									
Worker: Age	33.52	32.00	7.44	33.24	31.00	10.76	34.50	32.00	10.32
Job: Months of Tenure	58.72	41.70	47.39	23.28	11.60	42.39	40.95	24.60	50.65
Worker: Years of Education	12.68	12.00	2.67	12.67	12.00	2.71	13.05	12.00	2.79
Worker: Female	0.31	0.00	0.46	0.28	0.00	0.45	0.29	0.00	0.45
Worker: Wage in t=-8	3681.66	2564.45	3328.10	4311.94	2624.66	4919.75	4558.66	3050.98	4676.13
Worker: Wage in t=-4	4047.99	2892.19	3608.91	4545.13	2839.26	5025.44	4905.21	3326.89	5040.62
Firm: Number of Employees	703.61	302.00	1090.89	1921.77	476.00	3580.83	1073.50	466.00	1498.78
Firm: Manufacturing	0.30	0.00	0.46	0.17	0.00	0.37	0.23	0.00	0.42
Firm: Services and Retail	0.27	0.00	0.44	0.38	0.00	0.48	0.26	0.00	0.44
Firm: Other	0.43	0.00	0.50	0.46	0.00	0.50	0.51	1.00	0.50
Other variables									
Worker: White	0.58	1.00	0.49	0.52	1.00	0.50	0.56	1.00	0.50
Observations	34932			144124			164869		

Layoff Firms: Shopfloor Workers

From "Displacement Events and Job-Driven Scarring"

	Displaced (in sample)			Displaced (not in sample)			Non-displaced		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Outcome variables									
Ln Monthly Wage (in 2017 R)	7.44	7.34	0.56	7.35	7.26	0.57	7.35	7.29	0.53
Monthly Income (in 2017 R)	2078.25	1537.42	2266.89	1890.64	1419.52	1818.75	1844.40	1458.85	1493.68
Probability of Employment	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Matching variables									
Worker: Age	34.37	34.00	7.98	33.49	31.00	11.05	35.13	33.00	11.16
Job: Months of Tenure	54.31	41.60	37.56	16.11	8.50	28.51	32.97	19.70	41.00
Worker: Years of Education	9.39	10.00	3.21	8.69	9.00	3.54	9.00	9.00	3.51
Worker: Female	0.24	0.00	0.43	0.20	0.00	0.40	0.22	0.00	0.41
Worker: Wage in t=-8	1649.22	1355.12	1048.76	1678.97	1313.17	1349.11	1714.97	1365.76	1312.51
Worker: Wage in t=-4	1792.96	1460.86	1270.45	1742.67	1367.40	1539.88	1794.32	1431.27	1422.93
Firm: Number of Employees	742.66	300.00	1162.27	1035.97	499.00	1350.26	1073.20	455.00	1508.31
Firm: Manufacturing	0.37	0.00	0.48	0.23	0.00	0.42	0.25	0.00	0.43
Firm: Services and Retail	0.24	0.00	0.43	0.19	0.00	0.39	0.20	0.00	0.40
Firm: Other	0.39	0.00	0.49	0.57	1.00	0.49	0.55	1.00	0.50
Other variables									
Worker: White	0.50	1.00	0.50	0.40	0.00	0.49	0.42	0.00	0.49
Observations	251953			1624886			1180961		

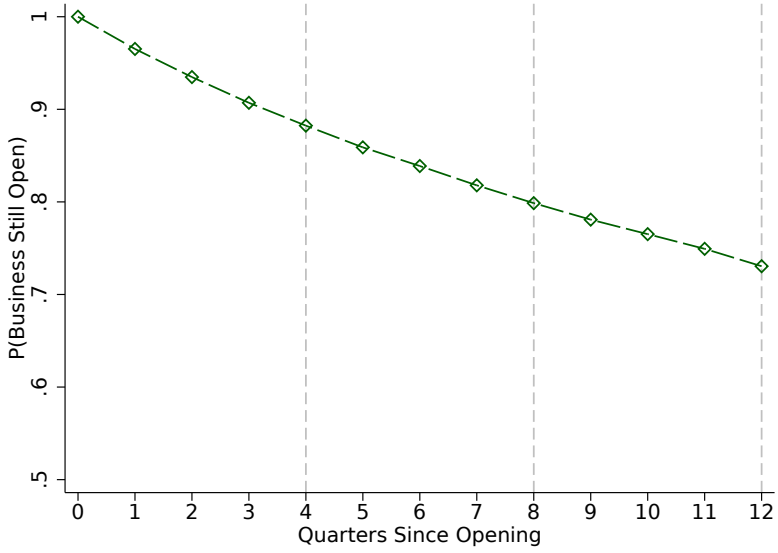
Identification Assumptions [Sun and Abraham (2021)]

1. Parallel trends in baseline outcomes
   - → Matching procedure: generate comparisons between similar workers, increasing the likelihood of a parallel trajectory in the absence of the mass layoff event
   - → Appears to hold during the pre-layoff period

2. No anticipatory behavior before treatment: workers might anticipate a mass layoff; advance notice of dismissals (limited in a yearly panel)
   - → Omit $\ell = -2$ instead of $\ell = -1$: [2] is required to hold before $\ell = -2$ only

3. Treatment effect homogeneity
   - → Matching laid-off and non-laid-off workers + stacking different panels for each cohort [Schmieder et al. (2023), Gengiz et al. (2019)]
   - → Workers are assigned a specific counterpart + large "never-treated" group
   - → Mitigate concerns that forbidden comparisons [Goodman-Bacon (2021), CS (2021)] are driving the results

Survival Curve



Business Formation and Outside Options

	Prob(Start a Business After Job Loss)					
	(1)	(2)	(3)	(4)	(5)	(6)
Outside Option	-0.086***	-0.086***	-0.058***	-0.065***	0.136***	0.088**
	(0.003)	(0.004)	(0.004)	(0.004)	(0.039)	(0.042)
College Degree			0.047***			0.033***
			(0.002)			(0.002)
# Outside			-0.034***			-0.020*
			(0.011)			(0.012)
Managerial Experience				0.031***		0.023***
				(0.004)		(0.004)
# Outside				0.019		0.023
				(0.015)		(0.015)
Ln(Wage) in $\ell = -1$					0.029***	0.022***
					(0.001)	(0.001)
# Outside					-0.020***	-0.012**
					(0.005)	(0.005)
Average LHS	0.042	0.042	0.042	0.042	0.042	0.042
Observations	294605	294605	294605	294605	294605	294605
R-Squared	0.004	0.011	0.015	0.011	0.016	0.018
Worker Controls		✓	✓	✓	✓	✓
Industry FE		✓	✓	✓	✓	✓
State FE		✓	✓	✓	✓	✓
Layoff Quarter FE		✓	✓	✓	✓	✓

Business Survival and Outside Options

	P(5-Year Survival)					
	(1)	(2)	(3)	(4)	(5)	(6)
Outside Option	-0.083***	-0.020	0.027	0.078**	0.340	-0.173
	(0.027)	(0.030)	(0.034)	(0.037)	(0.248)	(0.316)
College Degree			0.000			-0.011
			(0.016)			(0.017)
# Outside Option			-0.168**			-0.184**
			(0.068)			(0.081)
Managerial Experience				0.037*		0.034
				(0.021)		(0.023)
# Outside Option				-0.150*		-0.154
				(0.080)		(0.094)
Ln(Wage) in $\ell = -1$					0.012	0.015
					(0.008)	(0.009)
# Outside Option					-0.040	0.039
					(0.030)	(0.040)
Average LHS	0.602	0.602	0.602	0.602	0.602	0.602
Observations	12845	12845	12845	12845	12845	12845
R-Squared	0.001	0.034	0.035	0.036	0.035	0.037
Worker Controls		✓	✓	✓	✓	✓
Industry FE		✓	✓	✓	✓	✓
State FE		✓	✓	✓	✓	✓
Layoff Quarter FE		✓	✓	✓	✓	✓