

Corporate Takeovers and Labor Restructuring

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Motivation

- M&As are economically important transactions that reallocate control of productive assets.
 - The readjustment of firm boundaries is an important decision.
 - The reorganization process is informative of value creation sources.
- Empirical literature has largely focused on the reorganization of real assets (e.g. Maksimovic et al., 2011).
- Yet, labor is a significant production factor that contributes to productivity gains (Rajan and Zingales, 2000).
 - Firms are not the residual claimants of employees' human capital (Hart and Moore, 1990).
 - Human capital motivates takeovers (e.g. Ouimet and Zarutskie, 2016).
 - Anecdotally, the labor integration process in M&As is a complicated and contentious issue.

Motivation

- There is limited systematic evidence on the effects of takeovers on changes in the labor structure.
 - Previous literature has predominantly focused on net employment changes (Li, 2013; Dessaint et al., 2017).
- **Challenge:** Data Limitations
 - Sparse data or non-representative samples
 - Limited information on mobility and composition of labor
 - Inability to disentangle voluntary from involuntary separations

Research Questions

- What is the impact of takeovers on employment and wages?
 - Changes in Total Employment and Employee Wages
- What are the sources of the employment adjustment?
 - Demand- and Supply-Side Factors in the Employment Decisions of Firms
- Do takeovers have heterogeneous effects for different employees?
 - Cross-Sectional Variation in Employee Characteristics
 - Compositional Changes in the Labor Structure
 - Worker Displacement Effects and Reallocation of Labor

This Paper

- Focuses primarily on the labor force of **target firms**.
- Exploits an administrative employer-employee dataset.
 - **Universe** of Formal Employment in Brazil
 - Tracks Individuals and Firms over Time.
 - **Comprehensive Labor Contract Information:** Start and End Dates, Contract Type, **Termination Reason**
- Mitigates data limitations in previous studies.
 - Disentangles **supply-** and **demand-side** factors in the employment decisions of firms.
 - Provides novel evidence on **compositional** changes in the labor structure.
- Provides suggestive evidence on value creation sources in M&As.

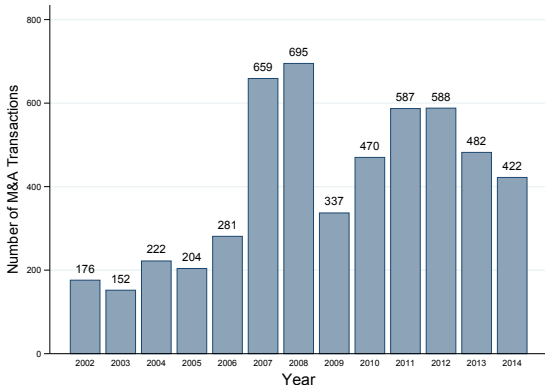
Related Literature

- 1 **Post-Takeover Restructuring Process** (e.g. Kaplan and Weisbach, 1992; Maksimovic et al., 2011)
- 2 **M&As and Labor:**
 - Labor restructuring and human capital considerations motivate M&As (e.g. Dessaint et al., 2017; Ouimet and Zarutskie, 2016; Tate and Yang, 2016).
 - Employment effects of M&As, PE transactions and LBOs (e.g. Li, 2013; Davis et al., 2014; Olsson and Tåg, 2017; Ma et al., 2017).
- 3 **Worker Displacement Effects** (e.g. Flaaen et al., 2018; Lachowska et al., 2019).
- 4 **Firms and Wage Inequality:** e.g. (Mueller et al., 2017; Song et al., 2016; Ma et al., 2017).

Institutional Setting

M&A Activity in Brazil

- Surge in M&A activity in Brazil due to economic growth, the commodity boom, and increased exposure to international trade.



Institutional Setting

Labor Regulation in Brazil

- Brazil is characterized by restrictive labor regulations and high employment protection (Botero et al., 2004).
- However, effective enforcement is **lax** and effective **firing costs** are relatively **low**.
 - **No restrictions** in labor contract terminations without just cause.
 - The employer is subject to a fine that increases at a rate of about one monthly wage per two years of employment.

Data Sources

- 1 **M&A Data:** M&A Transactions in Brazil from 2004 to 2012 from Thomson Reuters SDC Platinum.
 - Public and Private Targets
 - Only completed transactions that involve the acquisition of a majority stake (>50%).
 - Roughly 2,800 M&A Transactions
- 2 **RAIS Data:** Longitudinal Employer-Employee Linked Dataset by the Ministry of Labor and Employment (MTE) from 2002 to 2014.
 - Universe of Formal Employment in Brazil
 - Information on Start/End Dates of Employment, Occupation Type, Contract Type, Separation Type, Wage Level, Demographic Characteristics

Target Firms Vs. Acquiring Firms

- Acquiring firms are **3x larger** in terms of employment and have a **higher** share of **high-skilled** and **non-routine** labor at the time of the transaction.

Variables	Firm Characteristics					
	Target Firms			Acquiring Firms		
	p50	Mean	Std Dev.	p50	Mean	Std Dev.
Number of Employees	142	648	2,636	396	2,602	5,203
Routine Share	0.79	0.71	0.24	0.72	0.64	0.25
High-Skilled Share	0.16	0.27	0.26	0.26	0.35	0.29
Number of Firms	1,564			1,381		

Empirical Methodology

Specification

$$Y_{iptm} = \alpha_i + \alpha_{mt} + \gamma Post_p + \delta I_i^{M\&A} + \beta(I_i^{M\&A} \times Post_p) + X_i' \theta + \varepsilon_{iptm}$$

- **DiD:** Compare changes in labor-related outcomes in the pre- and post-takeover period of target firms or employees to firms or employees never involved in M&A activity.
 - $I_i^{M\&A}$: Equal to 1 for firms or employees targeted at an M&A transaction at any point in time.
 - $Post_p$: Equal to 1 for the two-year post-takeover period, and 0 for the two-year period prior to the M&A transaction.

Empirical Methodology

Endogeneity

- **Selection Bias:** **Non-random** assignment of firms as targets of M&A activity.
- **Matching estimator** approach to create a set of counterfactual firms (e.g. Davis et al., 2014).
- **Withdrawn M&As** for reasons unrelated to labor considerations.

Empirical Methodology

AKM

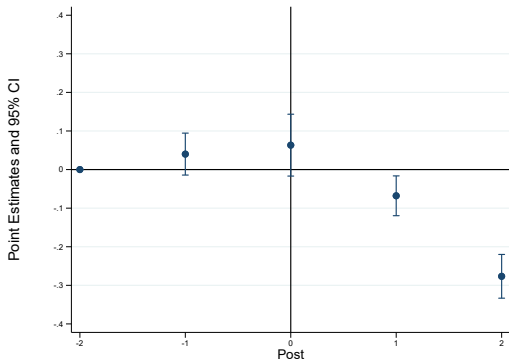
- To categorize firms into productivity types, I apply the methodology of Abowd et al. (1999).
 - Estimates a wage regression that decomposes log-wages in a **person** and a **firm fixed effect**.
 - Exploits the presence of employees that **switch firms** in matched employer-employee datasets.

$$w_{iJ(i,t)} = \theta_i + X'_{it}\beta + \psi_{J(i,t)} + \mu_t + \varepsilon_{it}$$

- I instrument for productivity by using the distribution of the **firm-specific wage premium**.
- Consistent with models of frictional labor markets in which higher-productivity firms pay higher wages for equivalent workers (Christensen et al., 2005).

I. Firm-Level Employment Outcomes

- 1 Acquiring firms actively restructure labor at target firms:
 - Target firms experience a significant decline of 29% in total employment and 17% in the total wage bill.



II. Employment Flows

- ② This employment adjustment reflects:
 - An increase of 35% in the likelihood of **involuntary exit** and a decline in the **hiring rate** for **low-skilled** employees.
 - An increase of 15% in the likelihood of **voluntary** exit for **high-skilled** employees.
 - Consistent with the link between thin labor markers for skills and firm-specificity of human capital (Jager, 2019), firms pay higher wages to replace high-skill workers.
 - **Occupational consolidation**

Sources of Value Creation

- **Neoclassical M&A Theories:**

- M&As are an efficient response to industry-specific regime shifts (e.g. technological shocks) leading to **technological change, skill upgrade and factor reallocation** (e.g. Jovanovic and Rousseau, 2002).
- Synergy gains are an important driver of M&As (e.g. Devos et al., 2008) materialized due to **asset complementarities** (e.g. Rhodes-Kropf and Robinson, 2008).
- M&As are a mechanism of mitigating **agency problems** in target firms (e.g. Jensen, 1989) and replacing **inefficient managers** (e.g. Jensen and Ruback, 1983).

Sources of Value Creation

- Exploit Cross-Sectional Heterogeneity Across:
 - ① Employee Skill Levels (e.g. Education, Person Fixed Effect from AKM)
 - ② Occupational Routine Task Intensity
 - ③ Occupational Overlap
 - ④ M&A Types (Focused Vs. Diversifying, Domestic Vs. Cross-Border)
 - ⑤ Managerial Position

III. Technological Change

- 8 M&As lead to changes in the composition of labor indicative of:
 - **Skill Upgrade:** There is a 7% increase in the share of high-skilled labor.
 - **Automation:** There is a 7.6% decline in the share of routine labor.
 - **Technology Adoption:** There is a 1.2% increase in the share of R&D-related employees.
- The effects are larger for **cross-border M&As** consistent with benefits of trade exposure in developing markets (e.g. Verhoogen, 2008; Bustos, 2011; Bloom et al., 2013).

IV. Synergies

- ④ **Occupational overlap** is an important driver of increased layoffs.
 - The likelihood of involuntary separation increases only for **target employees** with an **overlapping occupation** with the acquirer by 1.5% to 1.8% in the post-takeover period.

▶ Occupational Overlap

- ⑤ Horizontal M&As exhibit a higher potential for synergy gains through cost savings and consolidation compared to diversifying M&As.

▶ Takeover Types

IV. Synergies

- **Human Capital Relatedness Measure:** The scalar product of the occupational profile vectors of the acquiring firm i and the target firm j divided by the product of their lengths at the time of the transaction (Lee et al., 2019).

$$HCR_{ij} = \frac{H_i H'_j}{\sqrt{H_i H'_i H_j H'_j}}$$

- Merging firms with higher human capital relatedness experience a larger decline in total employment and total wage bill.

▶ Human Capital Relatedness

V. Agency Problems

- M&As are followed by an increased likelihood of involuntary separation for managers.

	(1)	(2)
Variables	Involuntary Separation	Voluntary Separation
Post $\times I_j^{M\&A}$	0.032*** (0.008)	0.005 (0.006)
Employee Controls	Yes	Yes
Employee Fixed Effects	Yes	Yes
Municipality x Year Fixed Effects	Yes	Yes
Observations	1,685,446	1,685,446
Adjusted R ²	0.32	0.30

Average Wages and Wage Inequality

- Takeovers are associated with technological change, automation and skill upgrade.
- Autor and Dorn (2013) document that the routine intensity occupational distribution is concentrated in the middle of the distribution of skills, implying that job polarization is accompanied by wage polarization.
- The relative increase in labor demand for skilled and non-routine workers in the post-takeover period is expected to contribute to an increase in within-firm wage inequality (Ma et al., 2017).

VI. Average Wages

- 8 Average wages decline for low-skilled employees and increase for high-skilled employees.

Variables	Average Wage	
	(1) High-Skilled Labor	(2) Low-Skilled Labor
Post $\times I_i^{M\&A}$	0.049*** (0.008)	-0.146*** (0.028)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Municipality x Year Fixed Effects	Yes	Yes
Observations	148,060	148,060
Adjusted R ²	0.88	0.62

VII. Wage Inequality

- Takeovers are associated with a 6.8% increase in wage dispersion and a 13.3% increase in the 90-10 gap.

	(1)	(2)
Variables	Standard Deviation of Log Wages	90-10 Wage Ratio
Post $\times I_i^{M\&A}$	0.068*** (0.012)	0.133*** (0.026)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Municipality x Year Fixed Effects	Yes	Yes
Observations	148,060	148,060
Adjusted R ²	0.60	0.68

VIII. Worker Displacement Effects

- Focus on the Employment Outcomes of Displaced Employees.

Variables	Employment Outcomes							
	Low-Skilled				High-Skilled			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Unemployed	Spells	Turnover	Log(Wage)	Unemployed	Spells	Turnover	Log(Wage)
Post	0.041*** (0.004)	0.441*** (0.041)	0.079*** (0.008)	-0.059*** (0.009)	0.036*** (0.003)	0.366*** (0.029)	0.095*** (0.007)	-0.110*** (0.007)
Post $\times I_j^{Treated}$	0.033*** (0.007)	0.430*** (0.078)	0.053*** (0.016)	-0.056** (0.024)	0.009 (0.008)	0.110 (0.056)	0.018 (0.013)	-0.021 (0.019)
Employee Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employee Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,896,486	28,896,486	28,896,486	28,896,486	5,209,967	5,209,967	5,209,967	5,209,967
Adjusted R ²	0.37	0.42	0.47	0.50	0.35	0.37	0.37	0.48

Additional Results

- The decline in wages is larger for employees that **change industry and/or municipality**.
- The wage increase for high-skilled workers is predominantly driven by **external hires**.
- The displacements effects are exacerbated in thin **local labor markets**.
- The probability of **within-firm hierarchical mobility** decreases for target employees.

Conclusions

- Target firms experience a large decline in total employment and total wages relative to control firms in the two-year post-takeover period.
- Target firms experience voluntary exit of high-skilled labor.
- Post-takeover labor restructuring is indicative of skill-biased and routine-biased technological change, and is driven by occupational overlap.
- The relative increase in labor demand for skilled and non-routine employees in the post-takeover period contributes to an increase in within-firm wage inequality.

Technological Change

Variables	(1) Share of High-Skilled Employees	(2) Share of Routine Employees	(3) Share of R&D Employees
$\text{Post} \times I_i^{M\&A}$	0.070*** (0.003)	-0.076*** (0.004)	0.012*** (0.002)
Firm Fixed Effects	Yes	Yes	Yes
Municipality x Year Fixed Effects	Yes	Yes	Yes
Observations	148,060	148,060	148,060
Adjusted R ²	0.91	0.88	0.62

▶ Back

Occupational Overlap

Variables	Target Employees			Acquirer Employees		
	(1)	(2)	(3)	(4)	(5)	(6)
	Voluntary	Involuntary	Involuntary	Voluntary	Involuntary	Involuntary
Overlap	0.001 (0.002)	0.015*** (0.002)	0.018** (0.008)	0.001 (0.001)	-0.001 (0.002)	-0.003 (0.004)
Low-Skilled			0.080*** (0.020)			0.042*** (0.006)
Low-Skilled × Overlap			0.010** (0.005)			0.005 (0.004)
Employee Controls	Yes	Yes	Yes	Yes	Yes	Yes
Employee Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,394,702	3,394,702	3,394,702	29,050,925	29,050,925	29,050,925
Adjusted R ²	0.45	0.42	0.44	0.48	0.41	0.42

▶ Back

Takeover Types

Variables	Combined Entity			
	Log(L)		Log(Wages)	
	(1)	(2)	(3)	(4)
	Focused M&As	Diversifying M&As	Focused M&As	Diversifying M&As
Post $\times I_i^{M\&A}$	-0.153*** (0.028)	0.025 (0.048)	-0.117*** (0.038)	0.039 (0.041)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Municipality x Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	179,908	39,517	179,908	39,517
Adjusted R ²	0.88	0.91	0.80	0.84

▶ Back

Human Capital Relatedness

Variables	Combined Entity			
	Log(L)		Log(Wages)	
	(1)	(2)	(3)	(4)
	High HCR M&As	Low HCR M&As	High HCR M&As	Low HCR M&As
Post $\times I_i^{M\&A}$	-0.193*** (0.036)	-0.095** (0.046)	-0.164*** (0.048)	-0.041*** (0.006)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Municipality x Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	92,247	83,513	92,247	83,513
Adjusted R ²	0.89	0.89	0.81	0.81

▶ Back