

Private Equity, Employment, and Productivity

Steven J. Davis, John Haltiwanger, Kyle Handley
Ron Jarmin, Josh Lerner, and Javier Miranda

The World Economic Forum, the Kauffman Foundation, Harvard Business School's Division of Research, and the Initiative on Global Markets at the University of Chicago Booth School of Business provided generous financial support. The analysis and results presented herein are attributable to the authors and do not necessarily reflect concurrence by the US Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed.

Overview of Study

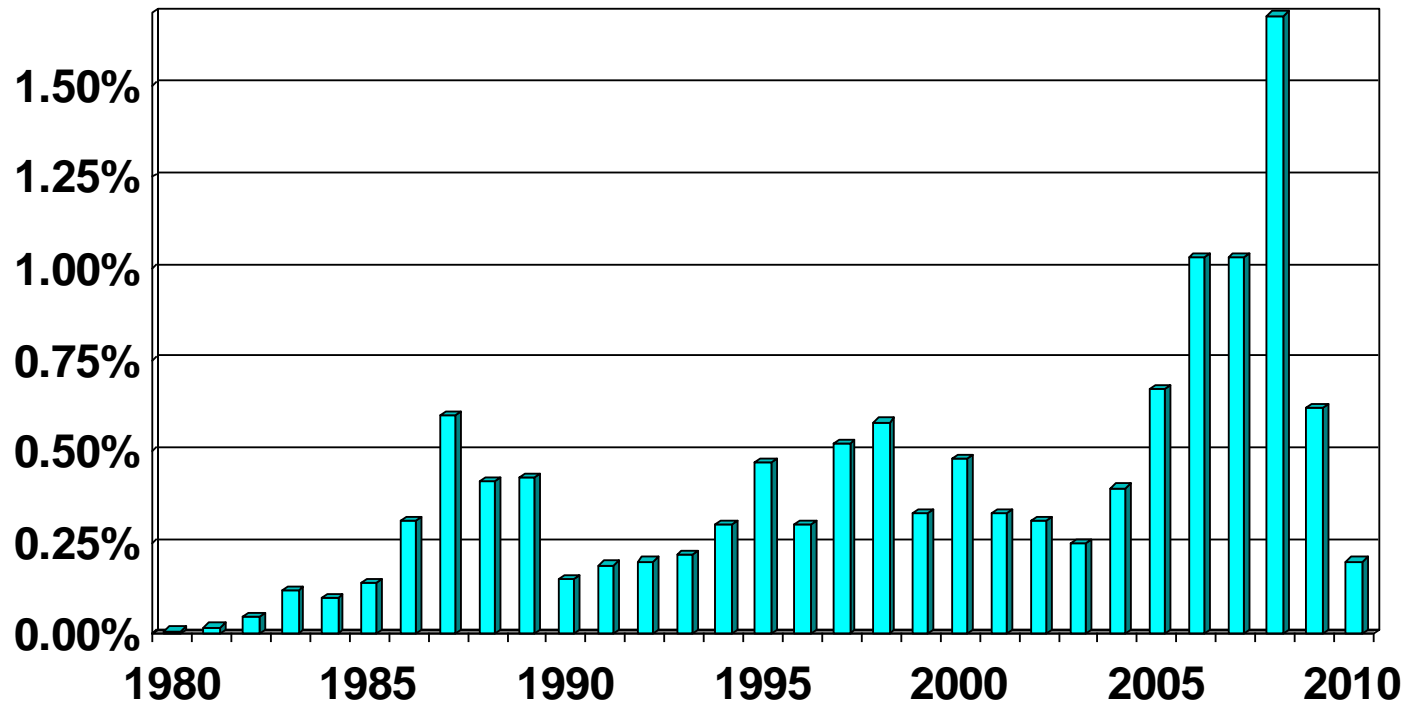
Chief Questions:

- What happens to employment, job creation and job destruction at private equity targets in the wake of buyout transactions?
- What happens to productivity?

Method: Compare PE targets to controls defined in terms of industry, size, and age:

- Follow targets and controls before and after buyout.
- Large dataset containing thousands of PE buyouts from 1980 to 2005.
- Matched to the universe of U.S. firms and establishments.

New Fund Commitments Worldwide as % of Equity Markets, 1980-2010



Source: Venture Economics, Asset Alternatives,
Preqin, and World Federation of Exchanges.

A Politically Charged Issue

- Critics complain about job losses
- Proponents (some from private equity industry):
 - Targets are in distress and need restructuring
 - Job losses, yes, but much job creation too
- Weaknesses in previous empirical studies:
 - Small, unrepresentative samples
 - Lack of suitable controls
 - Inability to disentangle organic growth from acquisition and divestitures
 - No measure of within-firm reallocation effects

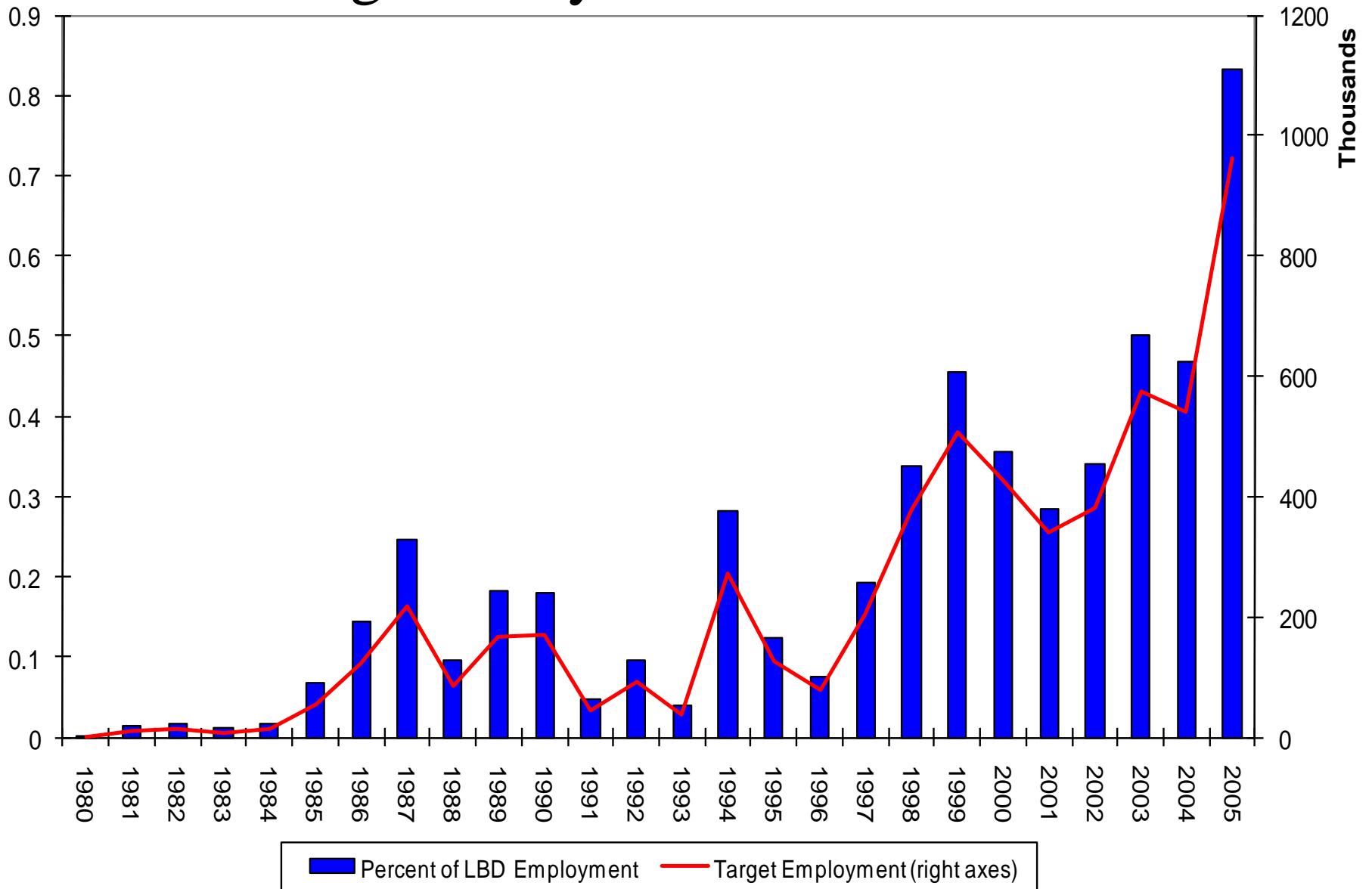
Data in Our Study

- Capital IQ data on private equity transactions: roughly 5,000 buyouts of U.S. firms from 1980-2005.
- Supplemented with data from Dealogic and COMPUSTAT.
- Integrated into Longitudinal Business Database (LBD) at the U.S. Bureau of the Census:
 - *Universe* of private businesses from 1975 to 2005.
 - Annual data on business name, EINs, employment, payroll, industry, location.
 - *Longitudinal* data on firms *and* establishments.

Sample and Matching

- ~5,000 U.S. target firms acquired in private equity transactions from 1980 to 2005.
- We currently match about 3,200 firms operating 150,000 U.S. establishments as of buyout year:
 - Extensive research required: Multiple ownership changes, re-incorporations, and much restructuring.
 - 70% match rate on a value-weighted basis.
 - LBD enables us to follow target firms and establishments over time and compare to controls drawn from the universe of U.S. businesses

Employment in New Private Equity Targets by Year, Matched Targets Only



How do PE Targets Compare to Entire Private Sector?

- Establishments operated by buyout targets are somewhat older than average.
- They are also bigger than average.
- Size and age differences reflect a concentration of private equity activity in manufacturing.

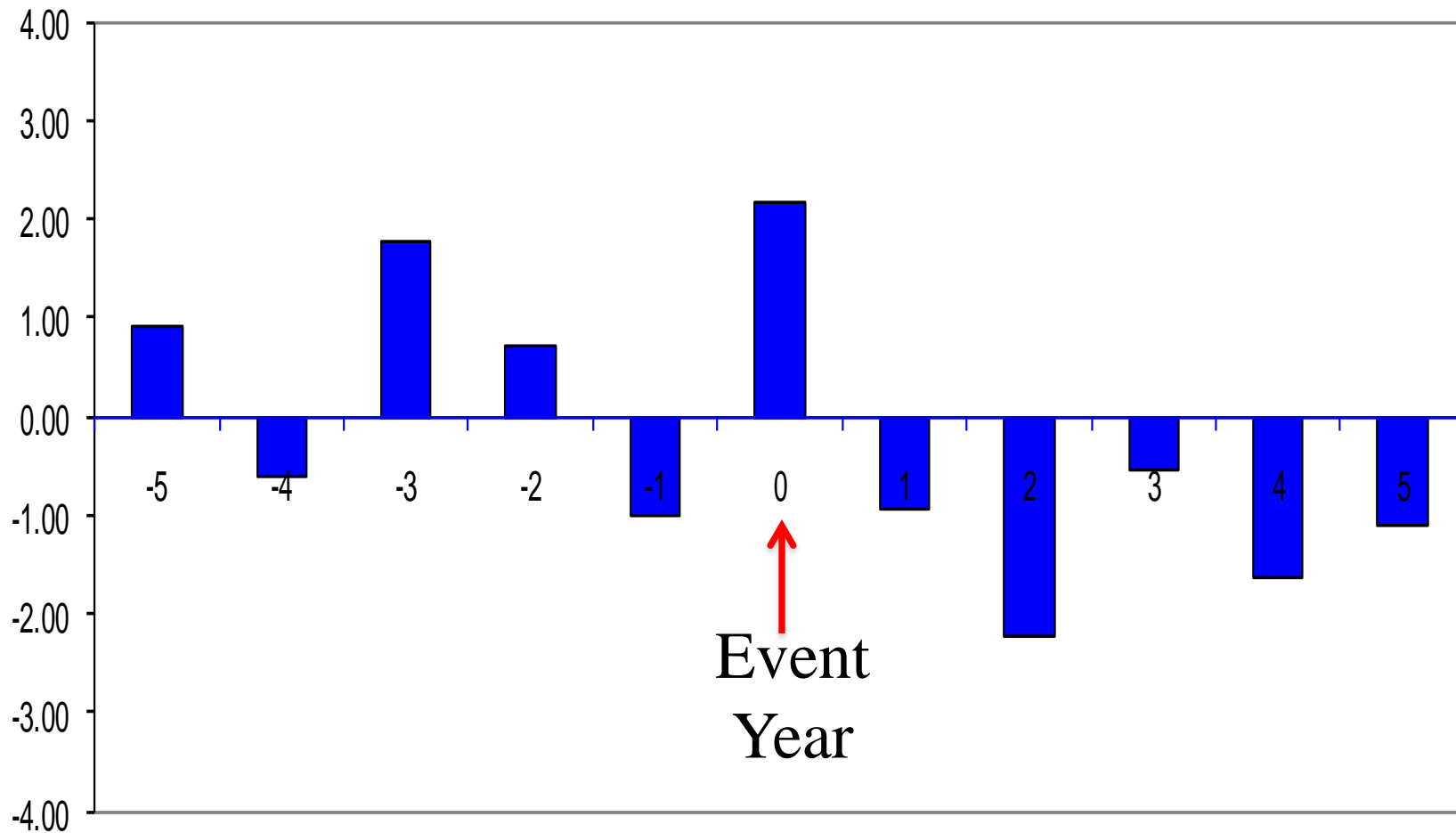
Establishment-Level Analysis

- Track target establishments forward and backward in time relative to event year:
 - Net employment growth rate.
 - Cumulative employment change.
 - Gross job creation and destruction rates.
- Do the same for controls, and compare outcomes for targets and controls.
- **Question:** *What happens to employment at target establishments before and after buyout event relative to controls?*

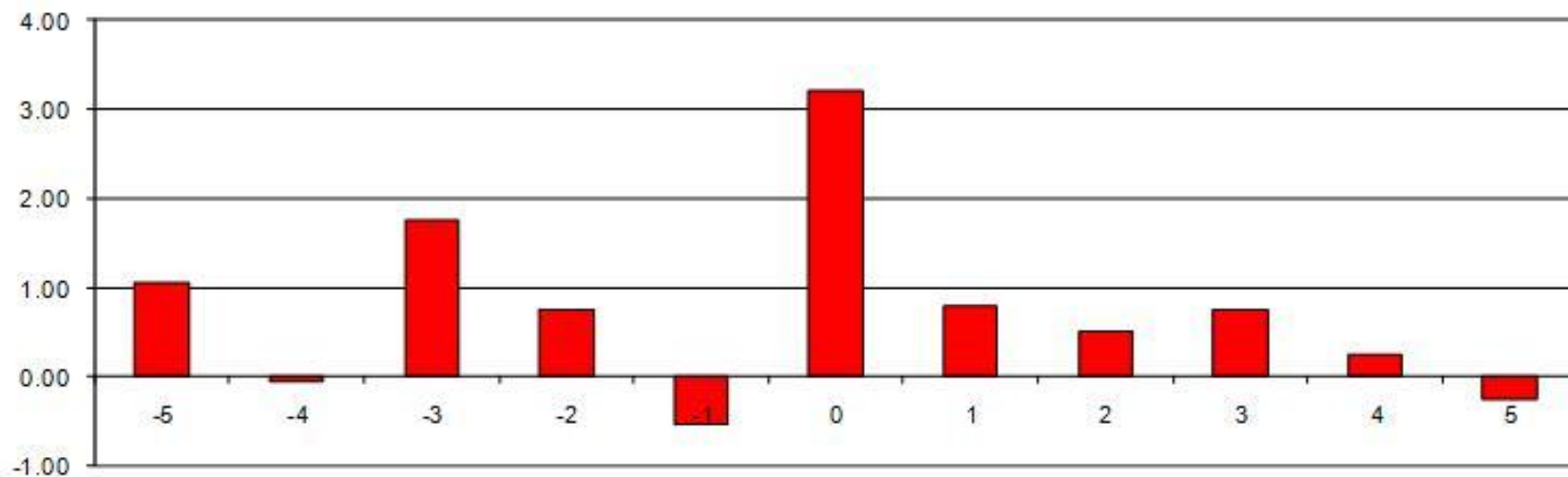
Analysis Sample

- Choose controls based on observable characteristics of target establishments in the buyout event year.
- 72 industries, 6 firm age categories, 10 firm size categories, multi-establishment dummy →
 - About 2,300 control cells per year.
 - About 44,000 control cells when pooled over years.
 - Targets populate more than 8,000 of these cells.
- Establishment-level analysis: 54,000 target establishments in buyouts that occurred from 1980 to 2000 and 4.9 million controls.

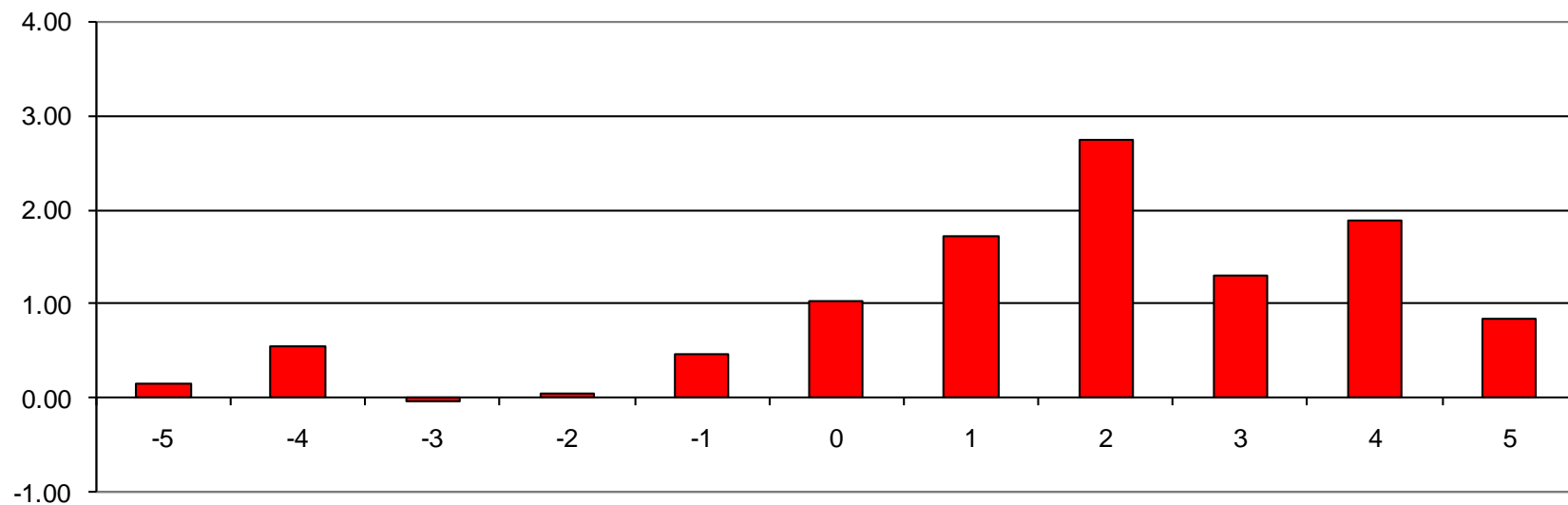
Comparison of Net Growth Rates -- Targets less Controls Before and After Event



**Comparison of Job Creation Rates Targets less Controls
Before and After Event**



**Comparison of Job Destruction Rates: Targets less Controls
Before and After Event**



Regression Analysis

- Estimate employment growth-rate differences between targets and controls 0, 1, 2, ... 5 years after buyout
- Controls: two-digit industry, 10 firm size classes, 6 firm age classes, multi-unit status, transaction year, and two measures of pre-buyout growth history.
- Consider specifications with uniform treatment effects and specifications that allow treatment effects to vary freely by firm size and age and with pre-buyout growth history.

Selected Regression Results

- Cumulative 5-year employment growth rate difference (target minus controls):
 - - 4.72% (regression with uniform treatment effects)
 - - 5.22% (regression with heterogeneous effects)
 - - 6.42% (non-parametric analysis above)
- Strong statistical significance.
- Greater net job loss at targets reflects more job destruction, especially job destruction accompanying establishment exit.

Taking Stock

- Employment falls more rapidly at target establishments than at controls post-buyout:
 - Higher job destruction, not lower job creation.
- Little difference between targets and controls in Manufacturing, big differences in Retail and Services.
- Thus far, the analysis ignores new jobs at new establishments opened post buyout.
- By design, it also neglects post-buyout acquisition and divestiture of existing establishments.

Firm-Level Analysis

- Firm-level employment can change by:
 - Job creation and destruction at establishments operated by firm as of buyout year
 - Job creation at greenfield establishments opened post buyout.
 - Acquisitions and divestitures post buyout.
- We focus on the two-year period after PE buyout given difficulty of tracking firms involved in complex reorganizations
- 1400 target firms and 1.9 million controls in our firm-level analysis.
- Specifications and controls: Similar to the establishment-level analysis.

Selected Firm-Level Results

- Cumulative post-buyout 2-year employment growth rate difference (targets minus controls):

Modeling of Treatment Effects	Total Employment	Organic Only
Uniform (Regression)	- 0.88	- 3.89
Heterogeneous (Regression)	- 0.65	- 3.62
Non-parametric Analysis	1.04	- 2.14

- Differences with establishment-level results reflect entry, acquisitions and divestitures.

Selected Firm-Level Results

- Cumulative post-buyout 2-year excess reallocation difference (targets minus controls):

Modeling of Treatment Effects	All Margins	Organic Only
Uniform (Regression)	8.00	5.52
Heterogeneous (Regression)	8.08	5.58
Non-parametric Analysis	7.89	5.36

- Private equity transactions are a catalyst for within firm restructuring and reallocation.

Non-Parametric Analysis: Details

A. Organic Changes, Excluding Acquisitions and Divestitures

<i>Rates Expressed as a Percent of Employment</i>	Target Firms	Control Firms	Difference
Job Creation	18.60	16.79	1.80
<i>Continuers</i>	5.20	5.63	-0.43
<i>Births</i>	13.40	11.17	2.23
Job Destruction	20.36	16.42	3.94
<i>Continuers</i>	6.94	6.71	0.23
<i>Deaths</i>	13.42	9.70	3.71
Employment Growth*	-1.77	0.38	-2.14
Job Reallocation	38.96	33.21	5.75
Excess Reallocation*	37.19	32.83	4.36
<i>Within-Firm</i>	20.39	15.03	5.36
<i>Between-Firm*</i>	16.81	17.80	-1.00

Non-Parametric Analysis: Details

B. All Adjustment Margins, Including Acquisitions and Divestitures

<i>Rates Expressed as a Percent of Employment</i>	Target Firms	Control Firms	Difference
Job Creation	29.48	22.23	7.25
Job Destruction	27.28	21.06	6.21
Employment Growth	2.21	1.17	1.04
Job Reallocation	56.76	43.29	13.46
Excess Reallocation*	54.55	42.12	12.43
<i>Within-Firm</i>	26.16	18.27	7.89
<i>Between-Firm*</i>	28.39	23.85	4.54

Deal Mix

- Wide variety of buyout types:
 - By enterprise value, 1970-2007:
 - Divisional: 30%
 - Public-to-private: 27%.
 - Private-to-private: 23%.
 - Secondary: 20%.
 - Other: 1%.
 - Kaplan-Stromberg [2009].

Firm-Level Results by Deal Type

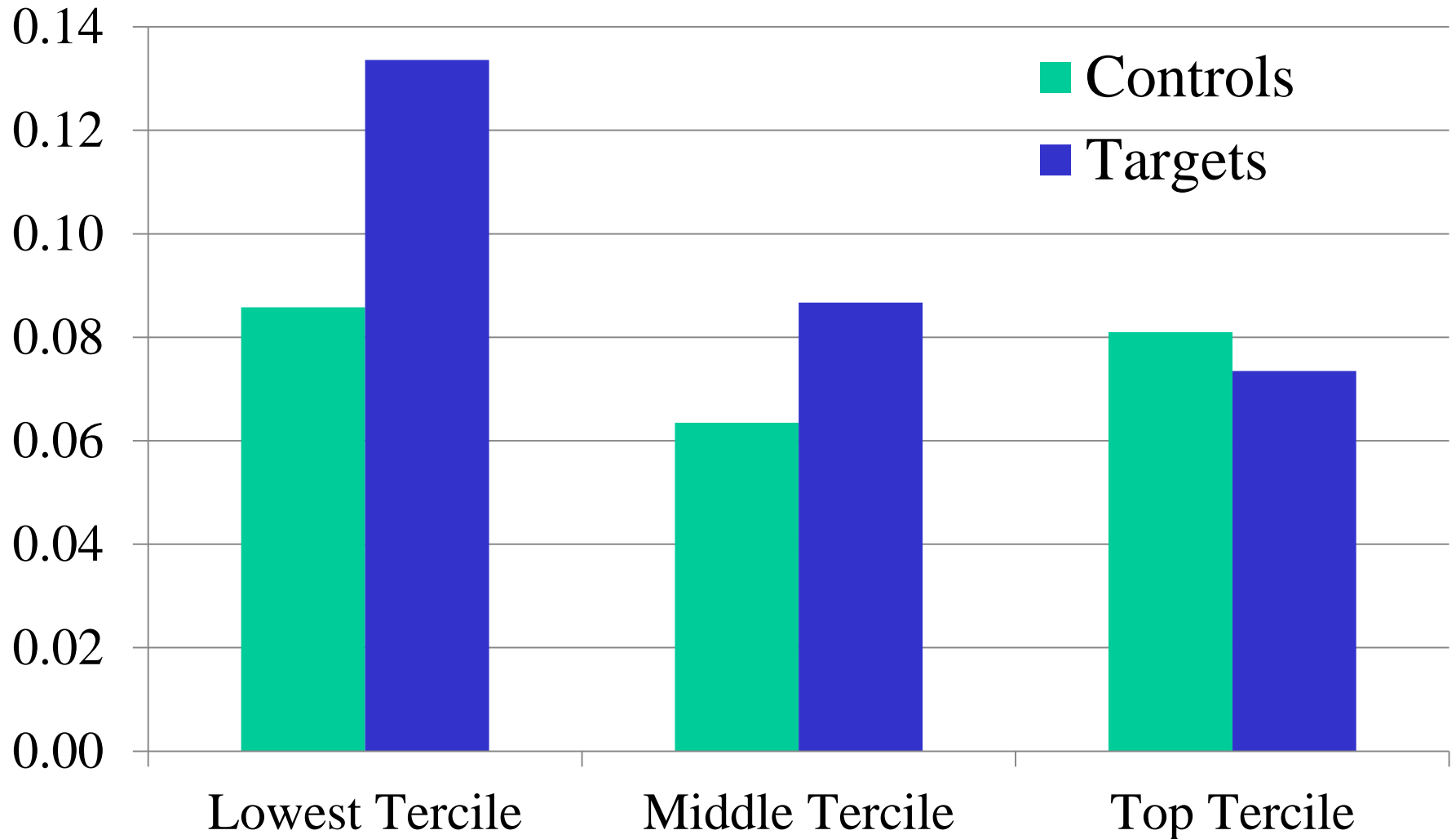
	<i>Type of Buyout Transaction</i>				
<i>Dependent Variable</i>	Public to Private	Independent to Private	Divisional Buyout	Secondary Buyout	Other
Net Employment Growth Rate	-10.36 (0.42)	10.51 (0.24)	-1.47 (0.45)	7.15 (0.58)	-6.45 (0.80)
Adjustment Margin					
Continuers	1.40 (0.25)	1.44 (0.16)	-1.42 (0.31)	3.11 (0.38)	-1.84 (0.56)
Divestitures	6.80 (0.13)	0.15 (0.05)	5.34 (0.11)	-0.06 (0.16)	-1.52 (0.19)
Deaths	5.95 (0.19)	1.50 (0.12)	5.97 (0.23)	12.14 (0.30)	9.28 (0.44)
Births	-3.12 (0.14)	-0.38 (0.07)	3.32 (0.13)	17.23 (0.19)	1.5 (0.25)
Acquisitions	3.98 (0.25)	10.98 (0.06)	7.61 (0.12)	-1.21 (0.16)	1.7 (0.21)
Job Creation All	-0.29 (0.24)	9.64 (0.14)	9.19 (0.28)	20.09 (0.36)	1.32 (0.50)
Job Destruction All	11.06 (0.28)	-0.88 (0.30)	10.34 (0.30)	12.04 (0.40)	7.84 (0.56)
Excess Reallocation All	2.14 (0.20)	1.67 (0.09)	13.65 (0.17)	32.25 (0.26)	5.29 (0.33)
Number of Observations	289,228	1,269,396	456,135	168,508	122,613

Implications for Productivity

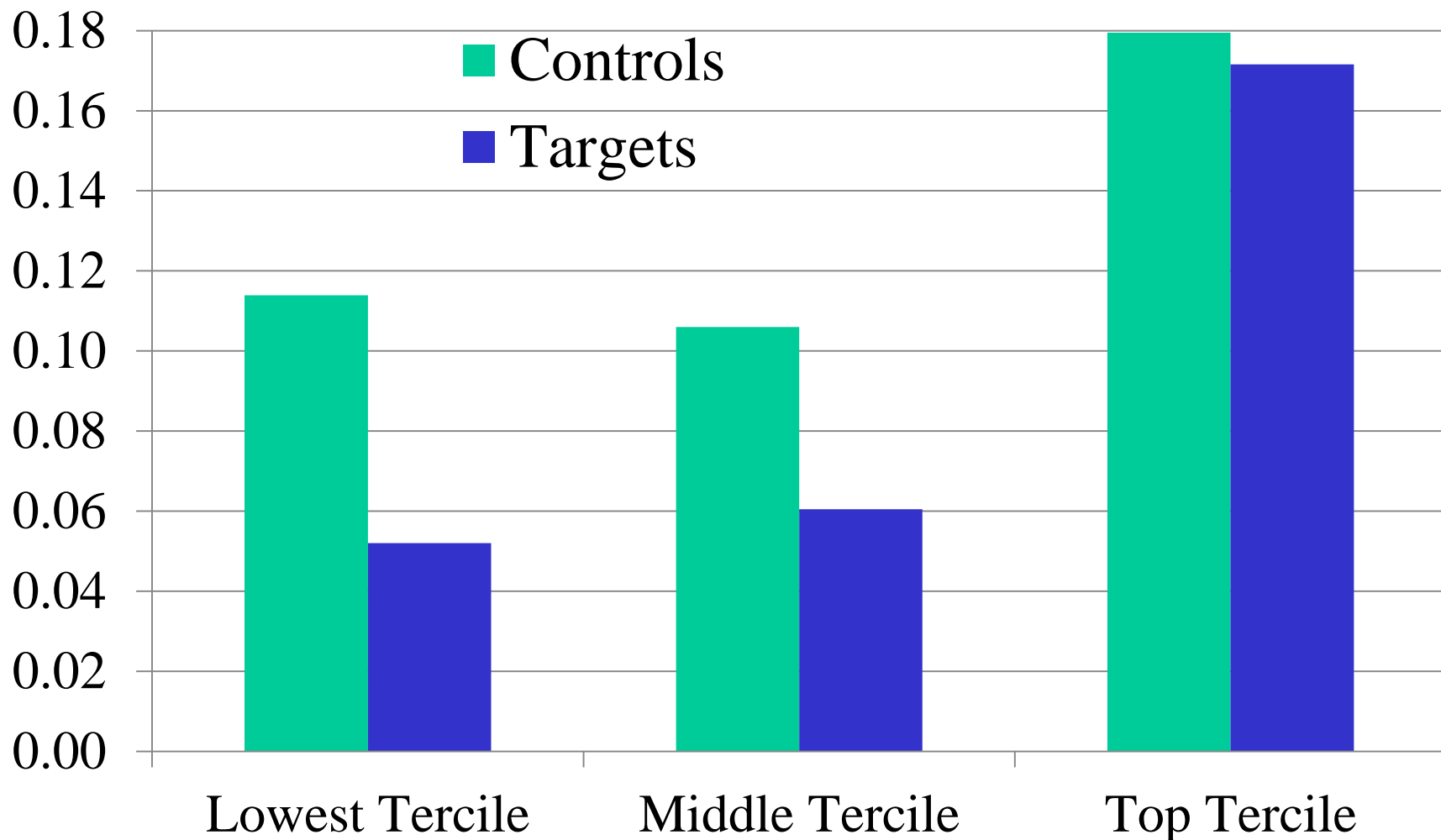
Chief Question: What happens to productivity at PE targets in the wake of private equity buyouts?

- Our initial (preliminary) analysis focuses on establishment entry and exit in manufacturing
- Post buyout, PE target firms are more likely to:
 - Close low-productivity establishments
 - Open new establishments that sit high in the productivity distribution
- These entry and exit patterns contribute to a pattern of more rapid TFP growth at target firms.

Two-Year Establishment Exit Probability by Tercile of Own-Industry TFP Distribution In the Buyout Year (Continuing Firms)



Post-Buyout Entrants as a Fraction of Establishments Two Years After Buyout by Tercile of Own-Industry TFP Distribution



At-risk group: Establishments operated by target or control firms two years after buyout.²⁴