

Private Equity and Employment: Appendix

A. *Matching Issues and Robustness Checks*

We match private equity deals to target firms and their establishments in the U.S. Census Bureau's Business Register (BR). We then use the BR to follow target firms and their establishments over time, obtaining annual observations. We also use the BR to identify controls (comparable firms and establishments) and follow them over time as well.

The Business Register (BR) tracks establishments and their parent firms using a combination of administrative records and survey collections that include the Company Organization Survey (COS), the Economic Censuses and the Annual Surveys of Businesses (e.g., the Annual Survey of Manufactures). Information about the company structure is incorporated in the BR by attaching firm identifiers to the establishments (physical locations where economic activity occurs). Ownership changes are identified when establishments switch parent firm through mergers, acquisitions and divestitures.

The Census Bureau assigns a unique firm ID to all the establishments under common ownership and control in a given year, including establishments that belong to subsidiaries under control of the parent corporation. This firm ID is distinct from a taxpayer ID such as the employer identification number (EIN). The relationships among the various IDs are as follows. In any given year, an establishment is uniquely associated with a single taxpayer ID and a single firm ID. Moreover, each taxpayer ID is uniquely associated with a firm ID. In the case of multi-establishment firms, a parent firm ID has multiple affiliated establishment IDs and potentially multiple EINs. Put differently, the EIN as a unit of observation is somewhere between an establishment and a firm.

To match deals and target firms in the Capital IQ data to the Census Business Register, our main method works as follows. First we use name and address information in the two data sources to match a particular deal to a specific unit in the BR. Because the matching algorithm relies partly on address information, this step identifies a specific matched establishment owned by the target firm – often but not always a headquarters facility. In a second step, we use the BR link between that establishment's ID and its firm ID to identify the target firm in the BR. In most cases, this method accurately identifies the target firm in the BR and all of its activity.

For divisional buyouts, we could not always identify the correct target firm in the BR after matching the deal to a specific establishment. These instances arose because, in some cases, the Census firm ID associated with the matched establishments did not change to reflect the ownership change of the division or subsidiary involved in the deal. We identified these problematic cases by observing that the matched target establishment remained affiliated with the parent seller firm even after the transaction. It is our understanding that the Census Bureau on occasion had difficulty tracking the new firm in divisional buyouts because of nonresponse on the COS or other survey instruments. In considering these cases, it is important to note that the BR still accurately tracks the activity of the target establishments.

We thus had two types of divisional cases. The first are those where we could accurately identify the target firm using our main method. The second are those where we could not

accurately identify the target firm using our main method. Even in those cases, we were able to link the matched establishment to at least a part of the target firm through the EIN (taxpayer ID). The complete target firm may or may not be identified in such cases, because the divisional business involved in the buyout may have operated with multiple EINs. In the main text and this appendix, we refer to such cases as EIN cases. In these EIN cases, we can accurately identify a part of the target firm in the transaction year and at least some of the corresponding target establishments.

Given the presence of EIN cases in our matched data samples, we proceed as follows. In the establishment-level analysis that tracks the pre and post outcomes of target and control establishments, we use both firmID cases based on our main method and EIN cases. Longitudinal establishment links in the BR allow us to track the pre and post outcomes regardless of ownership, so the inclusion of EIN cases poses no problem for our establishment-level analysis.

We exclude the EIN cases in the firm-level analysis, because the EIN is not suitable for tracking firms over time. For example, a target firm that adds a new establishment may obtain a new EIN for that establishment for accounting or tax reasons. Table 2 in the main text reports statistics for the EIN cases in the sample for the 1980-2003 period. There are 391 EIN cases over this period out of a total of 2265 target firms.

To check the sensitivity of our analysis to the EIN cases, we repeated the establishment-level analysis in the main text for the subsample that excludes the EIN cases. Results for this analysis are reported in tables and figures below. Figures A1.5a and A1.5b are the analogs to Figures 5a and 5b in the main text, and Figures A1.6 and A1.7 are the analogs to Figures 6 and 7. Table A1.3 is the analog to Table 3. In all cases, the results are quite similar to those reported in the main text.

We also encountered other matching problems when integrating the Census Business Register and Capital IQ data. For a small number of cases (16) where we retimed the transaction forward, we could not accurately identify the target firm in the forward year. These cases are excluded from the analysis.

B. Supplemental Figures

As noted in the main text, on average target and control establishments grow before the transaction year and shrink after the transaction year. This pattern is evident in Figure B.1 below.

Also, as noted in the main text, we investigated whether the patterns in Figure 5 are robust across sub-periods. Figure B.2 shows that that the main pattern documented in Figure 5 also holds for transactions in the 1980s, the 1990-94 period, and the 1995-2000 period.

Figure A1.5a

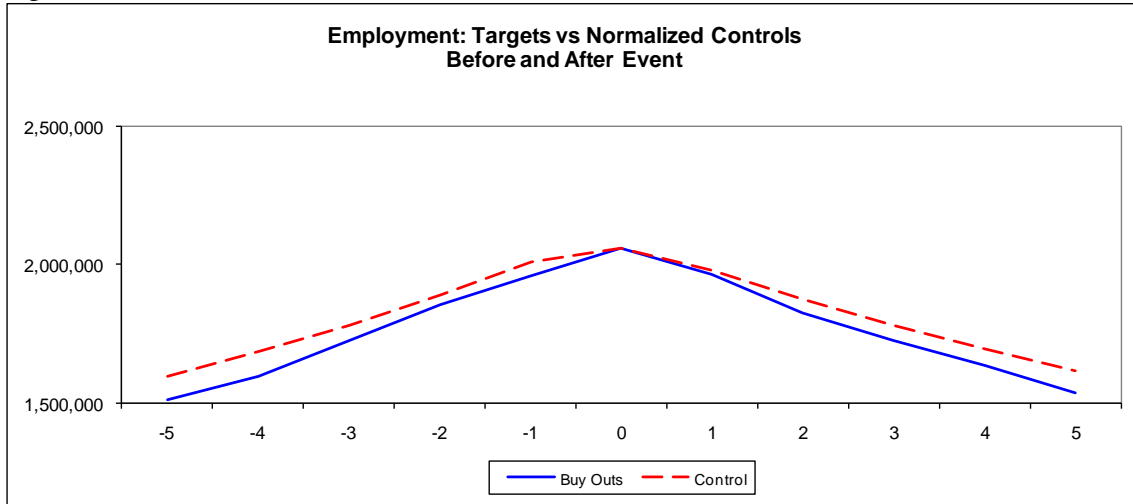


Figure A1.5b

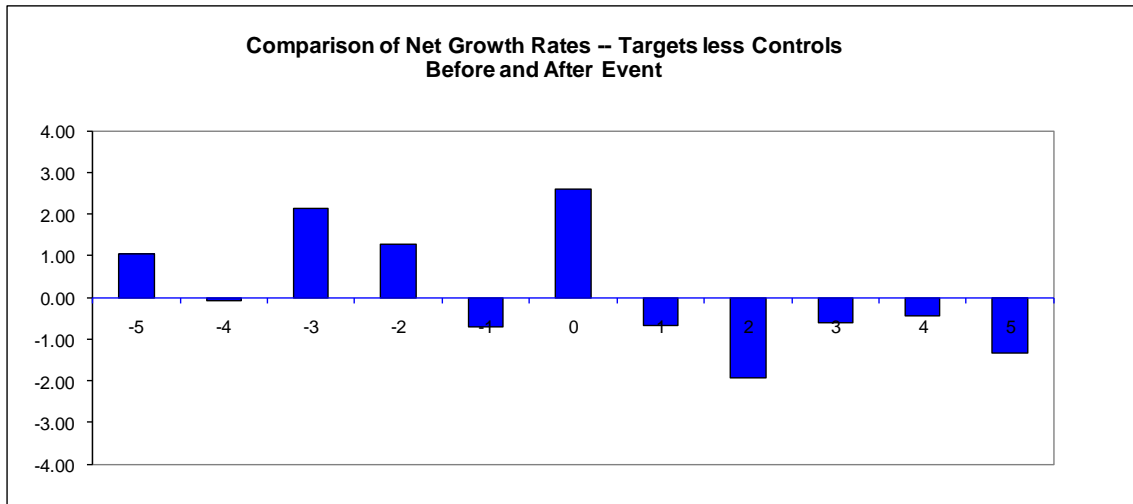


Figure A1.6a

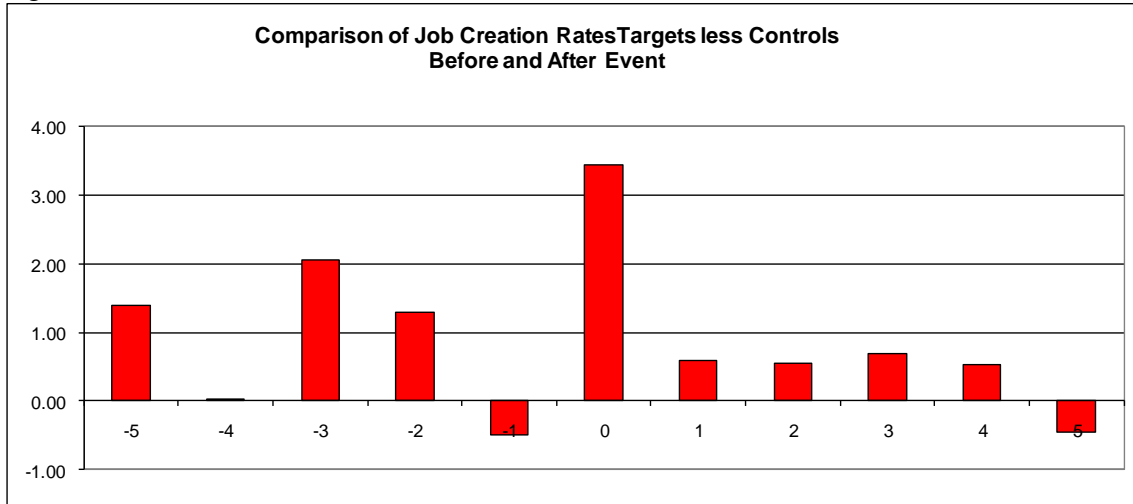


Figure A1.6b

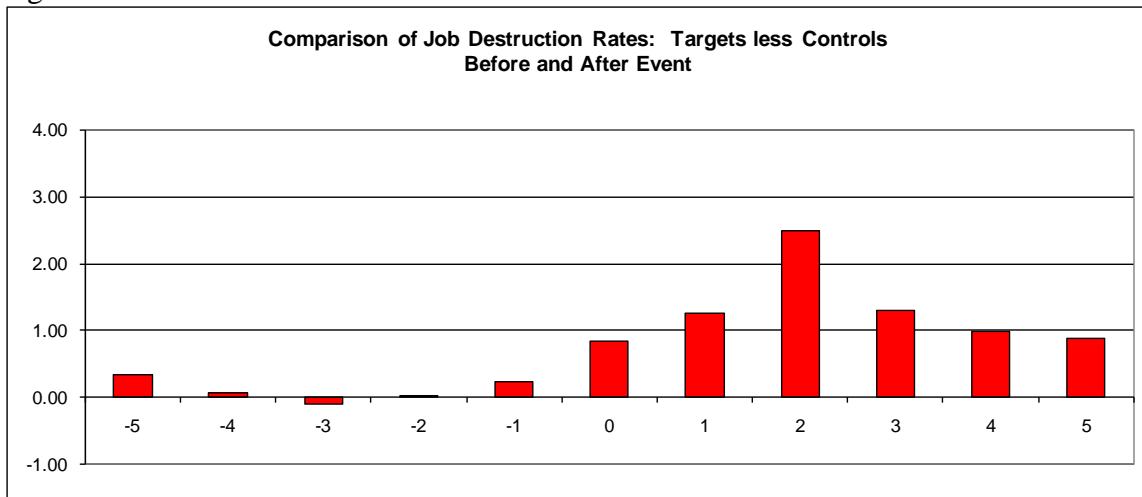


Figure A1.7

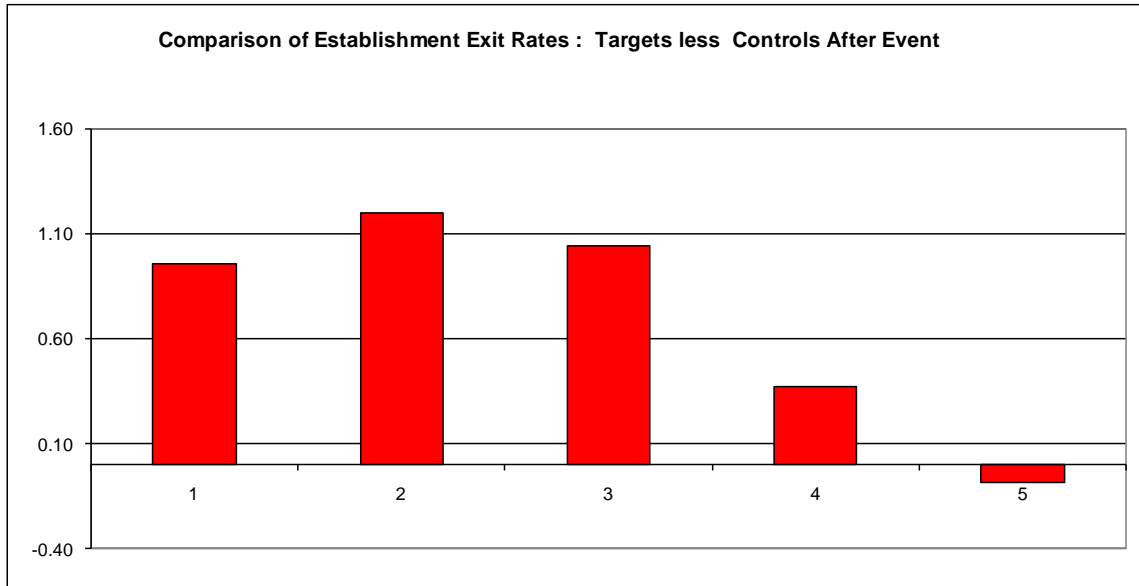


Table A1.3. Post-Transaction Employment Growth Rates at Target Establishments Relative to Controls, Transactions from 1980 to 2000, Sample Excludes EIN cases.

	Non-Parametric Comparison	Regression Approaches	
		ATE=ATE1	ATE1 Heterogeneous
Buyout Year	2.59	2.75	2.97
		(0.18)	(0.19)
Buyout Year +1	-0.67	-0.45	-0.94
		(0.21)	(0.21)
+2	-1.94	-1.39	-1.44
		(0.22)	(0.22)
+3	-0.60	-0.09	-0.01
		(0.22)	(0.23)
+4	-0.45	0.13	0.25
		(0.23)	(0.23)
+5	-1.33	-1.32	-1.55
		(0.24)	(0.24)
Cumulative Difference, Years 1 to 5	-4.99	-3.13	-3.69

Notes:

1. Table entries report estimated employment growth rate differences between targets and controls in the buyout year and following years. For example, the entries for “Buyout Year +2” report the estimated growth rate difference from Year 1 to Year 2 following the buyout. Each reported coefficient is for a different nonparametric comparison or regression. Standard errors are in parentheses. They are computed by the delta method in the “ATE1 Heterogeneous” regression.
2. The nonparametric comparison reflects the patterns displayed in Figure A1.5b. As explained in the text, this comparison controls for the cross product of 72 two-digit industries, 10 firm size categories, 6 firm age groups, multi-unit status, and transaction year.
3. The semi-parametric regressions control for two-digit industry, firm size categories, firm age categories, multi-unit status and transaction year plus two measures for the pre-buyout growth history of the parent firm. The “ATE=ATE1” specification imposes a uniform treatment effect, while the “ATE1 Heterogeneous” specification allows the treatment effect to vary firm size category, firm age category and the pre-buyout growth history measures.
4. The average number of establishment-level observations in each regression or nonparametric comparison is about 4.3 million. The observation count falls with each successive year following the transaction year because of target deaths and deleted observations for the corresponding control establishments.

Figure B.1

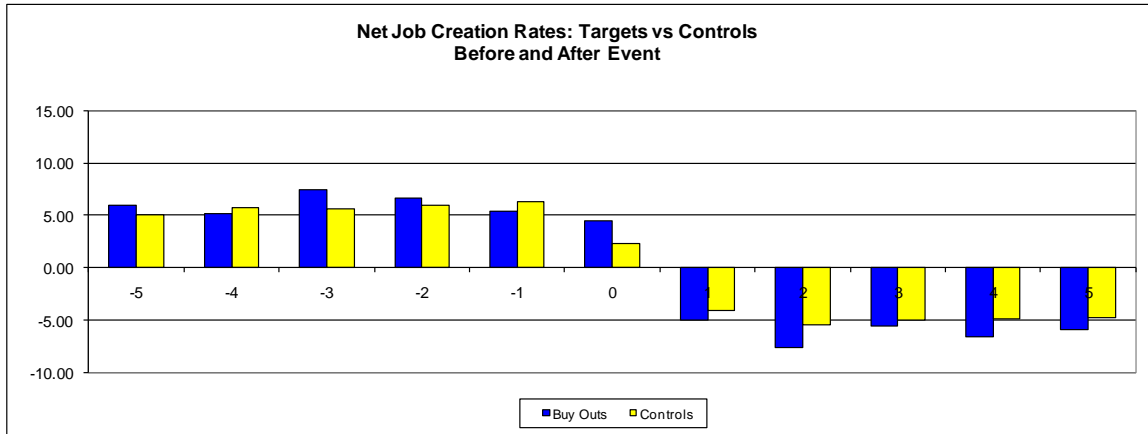


Figure B.2: Differences in Impact by Targets and Controls Across Different Time Periods

