The Impact of Private Equity Ownership on Medical Technologies

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Abstract

Private equity (PE) investment has become a major force in U.S. health care, yet the empirical evidence on its effects is concentrated on providers, such as nursing homes and hospitals. This focus misses where a large share of deal activity occurs: roughly two-thirds of PE health-care transactions involve medical devices, pharmaceuticals, and biotechnology—upstream sectors that shape the pace of innovation and the risks patients face. We provide, to our knowledge, the first causal evidence on how PE ownership of medical device manufacturers affects innovation, firm performance, and product safety. Theoretical predictions cut both ways. PE may relax financing constraints and introduce managerial expertise that speeds commercialization; alternatively, leverage, cost cutting, and short exit horizons may suppress long-run R&D or erode safety.

We assemble a new firm-level panel of U.S. medical device manufacturers that links ownership changes, product portfolios, and performance over time. We identify PE acquisitions using major health-care M&A databases between 1995 and 2019 and build a firm alias dictionary to track targets through post-deal renaming and restructuring. We then link firms to patent and FDA submission records (innovation), FDA adverse event and recall data (safety), and confidential Census and Compustat data (revenues, employment, survival).

Our baseline research design is a matched difference-in-differences framework comparing PE-acquired firms to observably similar firms that are never acquired. To address staggered treatment timing and heterogeneous effects, we implement modern difference-in-differences estimators and complement the baseline with (i) treated-only designs that exploit variation in acquisition timing among ever-treated firms and (ii) comparisons of PE targets to firms acquired by non-PE buyers.

Preliminary analyses focus on innovation among PE-acquired firms. For more than 500 innovative device firms (defined as those with at least one patent), we estimate that PE

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acquisition reduces the annual probability of filing any patent by 8.6 percentage points (SE 2.7) off a pre-acquisition mean of 40%, a roughly 20% decline. Event-study estimates show flat pre-trends and a growing decline in patenting after acquisition. This average effect masks considerable heterogeneity across different types of deals. The decline in innovation is driven entirely by leveraged buyout deals, which combine PE control with a high degree of leverage. In contrast, there is little effect of the other types of PE deals, which typically involve more equity investment. This suggests that debt-financed control transactions are particularly detrimental to innovative activity.

Ongoing work extends the analysis along three dimensions. First, we are identifying a matched set of never-treated comparison device firms to use as a control group in a difference-in-difference design. Second, we will examine additional outcomes, such as device safety and firm performance. Third, we will explore heterogeneity by device segment (including approval time heterogeneity), firm size, market structure, and fund specialization.

By tracing the consequences of PE ownership from innovation to firm dynamics and safety, the project will provide new evidence on how financial ownership structures shape medical technology markets and inform debates over appropriate oversight of PE in health care.