

Undervaluation Induced LBOs

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Introduction

Private equity firms buy and sell companies in LBOs

- Raise capital from investors that expect high returns (illiquidity, fees, carry)
 - This alpha can come from governance, financial, and operational engineering (Kaplan and Stromberg, 2009)
 - Another potential way is to buy low and sell high
- In this paper we study whether undervaluation shocks drive PE activity

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→ In this paper we focus on PE firms acquiring undervalued targets

Challenge is to identify valuation changes unrelated to firm fundamentals

- We build on the work of [Coval and Stafford \(2007\)](#), [Edmans et al. \(2012\)](#), and [Wardlaw \(2020\)](#)
 - Use mutual fund outflows to construct measures of undervaluation that are exogenous to fundamentals
- We hypothesize that exogenous changes in public valuations may also affect PE activity

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Mechanism

- Mutual funds may experience large outflows (fire sales) that force them to sell a part of their holdings
 - This liquidation can depress stock returns
- The lower stock returns may lead to more buyout activity

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Mechanism

→ The lower stock returns may lead to more buyout activity

What we do

1. Identify whether undervaluation is a key motive for buyouts
2. Analyze the operating performance of this type of buyout

Illustration of mechanism

We split stocks by their potential sensitivity to mutual fund fire sales

- Take all stocks held by mutual funds experiencing large outflows
- Rank stocks by % of shares outstanding held by mutual funds prior to fire sale. Keep top 25% → Fire sale stocks
 - When a fire sale occurs, the selling pressure should be larger on these stocks
 - They should exhibit lower returns and higher buyout likelihood

Excess return (stock return – market return)



Buyout likelihood



Mutual fund fire sales

- Mutual funds sold and domiciled in Europe from Morningstar Direct database from 2003-2017
 - Fund outflows, holdings, size
 - Includes domestic and global funds
 - Exclude sector funds
- Shares outstanding on each firm from Compustat

Private equity deals

- Buyouts in eight European countries between 2004-2018 from Orbis M&A (formerly Zephyr)
- Majority stake deals; non-missing financials; primary buyouts only
- 217 public-to-private buyouts; 4,082 private-to-private buyouts

Company characteristics

- Orbis to collect financial statements: total assets, operating revenue, employees, profits, total wages
- Ownership data from Orbis to identify acquisition vehicles, subsidiaries, divestitures/follow-ons, and PE firms and their stakes → Construct ownership-level financials

Measures for undervaluation

How to measure the effect of mutual fund fire sales on valuation?

- Large fire sales may force a mutual fund to liquidate a part of its portfolio; These liquidations may depress stock returns → Take outflows >5% of total MF assets in a quarter
- The price impact on the stocks held by the MF should be larger when:
 - The outflow is larger
 - The fraction of the mutual fund invested in the stock is larger
 - When the mutual funds holds a larger proportion of the total number of shares outstanding of a given stock
- Sales by mutual funds are non-random, therefore assume proportional sales on pre-fire sale holdings of the mutual fund

Measures for undervaluation

- Public: Wardlaw (2020)'s “flow-to-stock” measure (FTS) takes the above into account
- Private: Calculate value-weighted FTS using public stocks by country-industry-quarter (3-digit SIC)
 - Requires international sample (exploit variation across countries)
- We use a continuous measure and a Wardlaw dummy variable; aggregate from quarterly to annually

Does undervaluation increase public buyout likelihood?

Company-level undervaluation increases the likelihood of being a buyout target

	(1)	(2)	(3)	(4)	(5)	(6)
	PE	PE	PE	PE	PE	PE
Fire sale dummy	0.008*** (6.21)	0.004*** (2.83)	0.005*** (3.00)			
Fire sale continuous				0.007*** (6.58)	0.003*** (2.75)	0.004*** (2.71)
Return on assets			0.001 (0.35)			0.001 (0.44)
Total revenue (ln)			-0.000 (-0.49)			0.000 (0.06)
Observations	32,951	32,485	30,542	37,421	36,996	35,688
Mean Y	.005	.004	.004	.004	.004	.004
Public deals	149	128	125	156	145	145
N (shock)	9,655	9,597	9,325	9,518	9,512	9,512
F-test	38.58	8.00	3.4	43.29	7.56	2.84
Company FE		✓	✓		✓	✓
Country-year FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Does sector activity go up?

Sectors that experienced undervaluation show a higher level of buyout activity

- Finding holds for public-to-private, private-to-private, follow-ons based on deal count and aggregate deal size

	(1)	(2)	(3)	(4)	(5)	(6)
	PE deals (ln)	PE deals (ln)	PE deals (ln)	PE deals 3y (ln)	PE	Total assets (ln)
Fire sale ind. dummy	0.055*** (7.60)	0.053*** (6.97)	0.026*** (4.32)	0.038*** (6.88)	0.047*** (6.79)	0.524*** (5.58)
Nr. of companies (ln)		0.029*** (11.55)	0.016*** (9.01)	0.021*** (12.15)	0.021*** (10.94)	0.268*** (9.95)
Listed assets (ln)		-0.030*** (-3.10)	-0.019** (-2.33)	-0.023*** (-3.15)	-0.020** (-2.40)	-0.121 (-0.98)
Av. PE deals 3y (ln)			0.471*** (16.20)	0.455*** (16.41)		
PE					0.131*** (11.45)	
Av. PE assets 3y (ln)						0.229*** (10.47)
Observations	35,209	32,670	32,670	28,461	32,670	32,670
Mean Y	.110	.110	.110	.128	.121	1.260
N (shock)	8,358	8,366	8,366	7,479	8,366	8,366
F-test	57.75	49.75	95.44	107.7	83.27	56.72
Country-year FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

Are deal multiples lower?

Deal multiples are lower for undervalued private targets, especially for larger shocks

	(1)	(2)	(3)	(4)	(5)	(6)
	(Deal value + debt) / total assets			Deal value / Revenue		
Fire sale ind. dummy	-0.220** (-2.43)			-0.353** (-2.00)		
Fire sale ind. cont.		-4.142 (-1.65)			-13.152** (-2.57)	
Fire sale ind. [q=2]			-0.198 (-1.64)			-0.110 (-0.44)
Fire sale ind. [q=3]			-0.152 (-1.56)			-0.331* (-1.71)
Fire sale ind. [q=4]			-0.356*** (-2.76)			-0.666** (-2.51)
Return on assets	-1.217*** (-3.66)	-1.206*** (-3.62)	-1.197*** (-3.55)	-0.621 (-1.18)	-0.531 (-1.00)	-0.559 (-1.07)
Revenue (ln)	-0.030 (-1.50)	-0.036* (-1.83)	-0.030 (-1.53)	-0.255*** (-4.07)	-0.262*** (-4.12)	-0.261*** (-4.11)
Leverage	0.024*** (6.75)	0.024*** (6.71)	0.024*** (6.76)	0.027*** (4.82)	0.027*** (5.15)	0.027*** (4.76)
Observations	655	655	655	657	657	657
F-test	18.95	16.55	13.09	20.71	24.99	14.91
Country-year FE	✓	✓	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓	✓	✓

How do these buyouts perform?

Difference-in-difference setup with IV

- Company-level from two years before the buyout up to four years after
- Controls:
 - Public sample: Listed industry peers, irrespective of country
 - Private sample: Match each target to (at most) 5 industry peers from each of the eight countries on size and profitability
- We instrument PE ownership with the measure of undervaluation in the pre-buyout year
- First-stage F-stat is above the conventional threshold: Public sample (32.4) and private sample (116.6)
- Standard errors are two-way clustered on company and industry-year level

2SLS: Profitability and sales growth

Negative for
public

Panel A: Public-to-private deals				
	ROA	ROS	Oper. Rev. (ln)	ATR
Post × PE	-0.695*** (-3.83)	-2.117*** (-3.83)	-4.341*** (-5.16)	-0.297 (-0.89)
Post	0.034* (1.75)	0.104** (2.37)	0.317*** (5.02)	0.004 (0.13)
Observations	14,383	14,157	13,443	14,386
Company FE	✓	✓	✓	✓
Country-year FE	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓

Positive for
private

Panel B: Private-to-private deals				
	ROA	ROS	Oper. Rev. (ln)	ATR
Post × PE	0.028 (1.10)	0.082** (2.56)	0.646*** (3.83)	-0.455*** (-3.69)
Post	-0.007*** (-4.34)	-0.001 (-0.46)	-0.000 (-0.02)	0.017** (2.28)
Observations	384,352	384,370	296,964	384,551
Company FE	✓	✓	✓	✓
Country-year FE	✓	✓	✓	✓
Industry-year FE	✓	✓	✓	✓

Other outcomes

Other outcomes by type of buyout

Outcome	Public	Private
Investments in (fixed) assets	Negative	Positive
Follow-ons	Negative	Positive*
Divestments	-	-
Size of labour force	Negative	Positive
Labour prof/prod	-	-
Stock of patents	Negative	-
Patent application likelihood	-	Positive
Exploratory patents (%)	-	Negative

Findings

1. Undervaluation of the target or sector is related to an increase in buyout likelihood

- Buyout likelihood and aggregate activity goes up
- Total assets purchased in industries experiencing undervaluation is 50% higher
- Deal values are lower
- Findings hold under different market conditions and for public, private, and follow-on deals

Findings

1. **Undervaluation of the target or sector is related to an increase in buyout likelihood**
2. **Performance of undervaluation-induced buyouts differs by pre-deal status**
 - Profitability and sales decrease for public targets but increase in private targets
 - Size of the workforce decrease in public targets but increase in private targets
 - Most of the positive results come from the smaller private targets

Conclusion and contribution

Private equity motives

- Undervaluation is a key motive in buyouts
- Alpha in PE investments is also driven by investment timing, which is a skill

Instrumental variables in private capital

- Private equity firms are in the market of buying and selling companies, but do not randomly acquire targets
 - Difficult to differentiate selection from treatment
- We estimate the effect of PE ownership on a sample of European buyouts
 - Motivated by non-fundamental undervaluation
 - Local Average Treatment Effects
- Most of our findings confirm prior literature, but results differ strongly for public (restructure) and private targets (growth)