

Cross-Border Private Equity and Valuation Effects

Sharjil Haque
UNC-Chapel Hill

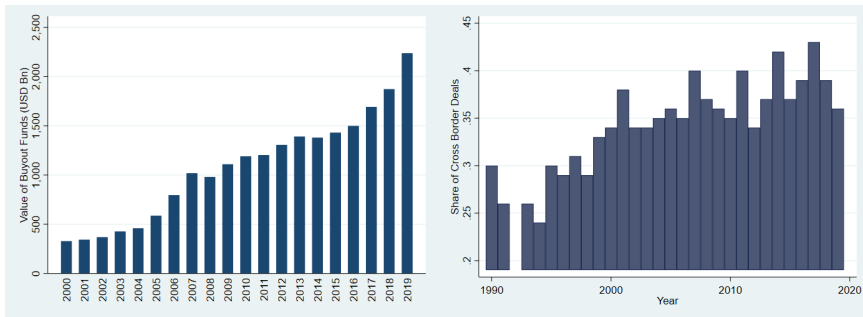
11th Emerging Markets Finance Conference 2020

December 15, 2020

Outline

- 1 Motivation and Research Question
- 2 Data and Methodology
- 3 Results
- 4 Conclusion
- 5 Appendix

Industry Size & Cross-Border deals



- LP commitments to Buyout funds in excess of USD 2 trillion
- Cross-Border buyout deals have risen steadily

Research Question

- Do changes in PE fund valuation affect the probability of a cross-border buyout more relative to a domestic buyout?
- Shed light on cross-border LBO mechanism; implication for risk-adjusted return to LPs

Transmission Mechanism

- Changes in Fund Valuation proxy changes in asymmetric information (AI) costs of raising debt
 - PE fund with higher valuations/better performance figures approaches lender
 - Lender spends less in monitoring/screening costs of target → lower AI
 - Higher access to debt/lower borrowing cost (Malenko and Malenko (2015); Demiroglu and James (2010))
- Firm-specific & country-specific factors affect valuations → greater valuation differences between rival bidders from different countries

Stylized Example

- Consider two similar PE firms domiciled in US, Japan; potential target domiciled in Japan
- Positive macro shock in US → US firms' valuations increase
- PE Firms: ↑ Fund Net Asset Value (NAV), ↑ Fund Internal Rate of Return (IRR)
- US PE firm can bid more aggressively due to higher access to external credit
 - *Lower information asymmetry due to higher valuations*

Key Findings

- 1** Strong positive relationship between pre-acquisition valuation effects and probability of a cross-border buyout relative to a domestic buyout
- 2** Effect is larger when expected long-term borrowing costs are low, liquidity risk/credit risk is low and foreign investor risk appetite is high
- 3** Effect is larger for low reputation PE firms where reputation is measured by performance, size and repeated interaction with lending markets
- 4** Evidence of mispricing around the time of deal activity

Existing Literature

- Froot and Stein (1991); Erel, Liao and Weisbach (2012) → Valuation effects on cross-border acquisitions
- Malenko and Malenko (2015); Demiroglu and James (2010) → LBO theory predicts buyout leverage is increasing in PE firm performance
- Axelson et. al (2013); Davis et. al (2019) → cost of borrowing and GDP growth affect deal-making activity and target performance
- Brown, Gredil and Kaplan (2016); Barber and Yasuda (2017); Jenkinson, Soussa and Stucke (2013) → GPs inflate/misprice NAVs to attract more capital from LPs

Outline

- 1 Motivation and Research Question
- 2 Data and Methodology
- 3 Results
- 4 Conclusion
- 5 Appendix

Data

- Data Source: Preqin
 - Easton, Larocque and Stevens (2020), Barber and Yasuda (2017), Brown et. al (2015), Ewen, Jones and Rhodes-Kropf (2013)

- Match deals data with valuation data:
 - 1 Deals Database: 11,252 completed LBOs from 1994-2018 (Country codes, PE firm date of inception, target's industry, deal value, target's pre-deal revenue, target's valuation)

 - 2 Cashflow Database: Fund-level quarterly Capital Calls, Distributions net of fees and NAV (scaled by fund size) Process

 - 3 Performance Analyst Database: Internal Rate of Return (IRR), Total Value/Paid-in Capital

Methodology: Measuring Valuation Effects

- Quarterly change in IRR
 - sensitive to capital calls and distributions

- NAV of a fund changes for 3 reasons:
 - 1 Cash is called from investors to acquire companies (Capital Calls)
 - 2 Cash is distributed back to investors (Distribution)
 - 3 Valuation of an existing portfolio company changes

Methodology: Measuring Valuation Effects ctd.

- I compute cashflow adjusted change in NAV (Jenkinson et. al (2013); Brown, Gredil and Kaplan (2016); Barber and Yasuda (2017))

$$\Delta NAVCF_{jit} = NAV_{jit} - (NAV_{jit-1} + C_{jit} - D_{jit}) \quad (1)$$

- Aggregated to the firm-level using fund-size as weights

Empirical Framework

- I follow Erel, Liao and Weisbach (2012)
- Logit model: $y_{it} = 1$ if deal is cross-border
- Variable of interest: Pre-acquisition valuations effects
 - 1 Change in IRR
 - 2 Change in cashflow adjusted NAV
- Controls: PE firm age, target revenue, target Enterprise Value/Sales, Deal Value
- Fixed Effects: Country, Industry, Year-Quarter

$$p(y_{it} = 1) = \frac{1}{1 + \exp(-\alpha - \beta_1 \frac{1}{n} \sum^n x_{i,t-n} - \gamma z_{i,t})} \quad (2)$$

Outline

- 1 Motivation and Research Question
- 2 Data and Methodology
- 3 Results**
- 4 Conclusion
- 5 Appendix

Descriptive Statistics

	Obs	Mean	Std. Dev	p25	p50	p75	p95
<u>Panel A: Private Equity firm</u>							
Fund IRR (Full Preqin sample, %)	81154	11.16	25.39	0.90	8.83	17.44	40.47
Fund Size (Full Preqin sample, \$ Mn)	213715	992	1959	175	389	890	3873
Firm Capital Commitments (\$ Mn)	11344	8721	14641	725	2275	8426	46962
Firm IRR (%)	11075	11.83	13.62	4.1	11.38	17.45	35.53
Firm NAV (\$ Mn)	11551	4.85	2.40	3.30	4.80	6.20	8.90
Firm Investment Multiple	11398	1.30	0.42	1.04	1.29	1.52	2.35
Firm Age (Years)	11608	21.40	12.04	13.00	20.00	28.00	46.00
<u>Panel B: Target Company</u>							
Entry Multiple (Enterprise Value/Sales)	2001	3.97	40.32	0.4	1.48	2.69	6.41
Deal Value (\$ mn)	4390	990	2535	100	306	909	3600
Revenue (\$ mn)	2901	5457	72612	74	250	816	5900

- All variables from Row 3 onwards are matched to an LBO transaction
- Comparable to other datasets as well as recent survey (Brown et. al (2015); Hammer et. al (2017); Gompers, Kaplan and Mukharlyamov (2020))

Result I: Impact of Valuation Effects on Probability of Cross-Border Buyout

Cross-Border LBO and Valuation Effects

	Change in IRR				Change in Cashflow Adjusted NAV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔIRR	0.049*** (0.011)	0.071** (0.030)	0.059*** (0.013)	0.052** (0.021)				
$\Delta NAVCF$					0.019*** (0.005)	0.050*** (0.011)	0.037*** (0.006)	0.045*** (0.012)
Log (Target Revenue)		0.215*** (0.044)				0.222*** (0.045)		
Log (Deal Value)			0.285*** (0.000)				0.285*** (0.000)	
Entry_Multiple				0.000 (0.001)				0.000 (0.001)
Pseudo R-squared	0.544	0.521	0.540	0.491	0.543	0.527	0.544	0.471
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
N	10868	2488	3795	1545	10934	2498	3856	1508

- **Marginal Effect at the Mean:** One S.D. increase in valuations (5.18 percent of fund size) raises the predicted probability of a cross-border buyout by 6.38 percent

Result II: Role of Global Financial Conditions

Global Financial Conditions and Cross-Border Buyout

- Interact $\Delta NAVCF$ with proxies for global financial conditions
- Choice of variables guided by Asis, Chari and Haas (2020); Chari, Dilts Stedman and Lundblad (2020)
 - AE borrowing costs and monetary conditions
 - 1 Treasury yield curve slope
 - 2 Excess Market Return
 - Credit Risk and Market Volatility
 - 1 TED Spread
 - 2 VIX
 - Changes in Global Risk Appetite
 - 1 Change in Broad Dollar
 - 2 'Risk-on'-'Risk-Off' Index

G.V. Definition

AE Borrowing Conditions and Cross-Border Buyouts

	Yield Curve Slope				Excess Market Return			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta NAVCF$	0.024*** (0.007)	0.075*** (0.010)	0.060*** (0.007)	0.072*** (0.012)	0.017*** (0.006)	0.040*** (0.011)	0.039*** (0.011)	0.039*** (0.011)
$\Delta NAVCF \times Yld_Slope$	-0.007** (0.003)	-0.033*** (0.008)	-0.029*** (0.008)	-0.032*** (0.011)				
$\Delta NAVCF \times Excess_Return$					0.000 (0.916)	0.018*** (0.004)	0.018*** (0.004)	0.018*** (0.004)
Yld_Slope	-5.219 (5.797)	-5.702 (5.110)	-3.546 (5.856)	-5.961 (8.198)				
Excess_Return					-0.006 (0.567)	0.017 (0.042)	0.004 (0.041)	0.010 (0.043)
Pseudo R-squared	0.543	0.528	0.544	0.472	0.529	0.477	0.473	0.474
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	N	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	N	Y	Y	Y
N	10934	2498	3856	1508	10969	1508	1508	1508

Columns (1) - (4): As expected long-term borrowing costs decrease, effect of rising valuations on cross-border buyout probability becomes larger

Global Liquidity/Credit Risk, Market Volatility and Cross-Border Buyouts

	TED Spread				VIX			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta NAVCF$	0.028*** (0.011)	0.068*** (0.012)	0.087*** (0.019)	0.086*** (0.018)	0.132*** (0.023)	0.174*** (0.024)	0.173*** (0.024)	0.173*** (0.024)
$\Delta NAVCF \times TED_Spread$	-0.016 (0.016)	-0.031** (0.013)	-0.071*** (0.027)	-0.070*** (0.025)				
$\Delta NAVCF \times VIX$					-0.004*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)
TED_spread	-17.448 (19.425)	-19.337 (17.608)	-15.849 (20.399)	-20.011 (27.437)				
VIX					-1.389 (1.262)	-1.143 (1.496)	-1.443 (2.002)	-1.431 (1.950)
Pseudo R-squared	0.543	0.527	0.476	0.472	0.528	0.478	0.474	0.474
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
N	10934	2498	1508	1508	2498	1508	1508	1508

- Similar results with RORO Index and Change in Broad Dollar (Appendix)

Result III: Role of Heterogeneity in PE Firm Reputation

Stronger effect for low reputation PE firms?

- $Reputation_{it} = 1$ for low reputation PE firm; Add interactions with $\Delta NAVCF$

- Definition based on performance and size
 - 1 High reputation firm in time t if Total Value/Paid-in Capital (TVPI) is above the median of all PE firm's TVPI in year-quarter $t-1$
 - 2 Similarly defined for size (Assets Under Management)

Reputation Effects by Investment Multiple

	(1)	(2)	(3)	(4)
$\Delta NAVCF$	0.002 (0.011)	0.028* (0.015)	0.015** (0.005)	0.012 (0.018)
$\Delta NAVCF \times Reputation$	0.0396** (0.018)	0.056** (0.025)	0.040** (0.019)	0.065*** (0.025)
Reputation	-0.479*** (0.125)	-0.641*** (0.091)	-0.379** (0.152)	-0.623*** (0.165)
Log (Target Revenue)		0.165*** (0.045)		
Deal_Size			0.000*** (0.000)	
Entry_Multiple				-0.000 (0.000)
Pseudo R-squared	0.541	0.537	0.547	0.484
Country FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y
N	10054	2329	3613	1426

- Similar results with size-based measures of Reputation

Result IV: Evidence of Mispricing

Decomposing Valuation Effects

- Mispricing *ex ante* can be detected from returns *ex post* (Baker, Foley and Wurgler (2009))
- Future returns instrument for mispriced component of valuations
- I use future ΔIRR to instrument for mispricing in $\Delta NAVCF$
 - 1 1-year ahead future change in IRR
 - 2 2-quarter ahead future change in IRR
- Use fitted values (mispriced component) and residual (fundamental component) to rerun equation (2)

Valuation Effects: Fundamental vs Non-Fundamental Component

	1-year ahead				2-quarter ahead			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fitted $\Delta NAVCF$	0.064 (0.043)	0.390*** (0.087)	0.160** (0.076)	0.370*** (0.122)	0.123 (0.193)	0.505 (0.382)	0.466* (0.263)	0.572* (0.328)
Residual $\Delta NAVCF$	0.015*** (0.004)	0.031*** (0.010)	0.031*** (0.006)	0.028** (0.013)	0.016*** (0.004)	0.043*** (0.011)	0.032*** (0.006)	0.040*** (0.010)
Target_Revenue		0.222*** (0.052)				0.195*** (0.052)		
Entry_Multiple				0.000 (0.001)				0.001 (0.001)
Deal_Size			0.000*** (0.000)				0.000*** (0.000)	
Pseudo R-squared	0.546	0.544	0.511	0.469	0.551	0.481	0.522	0.481
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
N	9318	2173	3255	1312	9689	2083	3376	1382

Outline

- 1 Motivation and Research Question
- 2 Data and Methodology
- 3 Results
- 4 Conclusion**
- 5 Appendix

Conclusion

- First micro evidence on the link between PE valuations and cross-border LBOs
- Strong positive association between fund valuation increase and probability of cross-border buyouts
- Implications for risk-adjusted return to LPs and understanding of cross-border LBO mechanism

Thank You!

Outline

- 1 Motivation and Research Question
- 2 Data and Methodology
- 3 Results
- 4 Conclusion
- 5 Appendix**

What is Private Equity?

- Metrick and Yasuda (2010) define Private Equity (PE) as function of acquirer characteristics
 - 1 Financial intermediaries
 - 2 Buy only private firms (or buyout/delist public firms)
 - 3 Monitor/manage target companies
 - 4 Maximize financial return in a given period (financial buyer); as opposed to maximizing synergistic benefits (strategic buyer)
- Factors affecting PE fund valuation
 - 1 Cash flows between **General Partner (GP)** and Limited Partner
 - 2 Valuations of existing portfolio companies (cashflow effect/discount rate effect)

Preqin Cash Flow calculation Methodology

Dataslide

- LP/GPs report total capital commitment by fund, cumulative capital contributed, cumulative distributions and Unrealized Value
- Quarterly difference in cumulative calls and distributions gives quarterly capital calls and distributions
- Scaled to a hypothetical capital commitment of USD 10,000,000

Mispricing of Fund NAVs

Ret.

- True NAV: price that would be received to sell an asset in a transaction between market participants at the measurement date (FAS 157 Fair Value Measurements, 2007)
- Deviation from True NAV:
 - 1 GP has irrational expectation of future cashflows of portfolio companies
 - 2 GP strategically manipulates interim NAVs to attract capital (growing evidence around the time of fundraising; none yet around the time of deal activity)

$$\text{Mispricing} = \text{Reported NAV} - \text{True NAV} \quad (3)$$

Global Variable Definitions

GVslide

- Yield Curve Slope: Difference between the 5-year treasury and the Fed funds rates (bond market expectation of short-term interest rate in the future, so borrowing cost at longer-maturities)
- Excess Market Return: Value-weighted return on all NYSE, AMEX and NASDAQ stocks minus the one-month treasury bill rate
- VIX: Chicago Board Options Exchange's CBOE Volatility Index
- TED Spread: Spread between 3-month LIBOR Rates and 3-month T-bill rates
- Change in Broad Dollar: Trade-weighted averages of exchange rates from a broad basket of US trading partners

Global Variable Definitions ctd.

GVslide

- "Risk-on Risk Off" Index: Index of several variables; positive changes imply 'risk-off' behavior and scaled by respective historical standard deviations
 - 1 ICE BofA BBB Corporate Index Option-Adjusted Spread
 - 2 Moody's Seasoned Aaa Corporate Bond Yield Relative to Yield on 10-Year Treasury Constant Maturity
 - 3 Moody's Seasoned Baa Corporate Bond Yield Relative to Yield on 10-Year Treasury Constant Maturity
 - 4 Broad Dollar Index
 - 5 NASDAQ index
 - 6 TED Spread
 - 7 S&P 500 Index
 - 8 EURO STOXX Index
 - 9 CBOE Volatility Index
 - 10 NASDAQ Volatility Index
 - 11 CBOE DJIA Volatility Index
 - 12 Gold spot price

Risk-on, Risk-off and Cross-Border Buyouts

	RORO Index				Change in Broad Dollar			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta NAVCF$	0.013*** (0.005)	0.026 (0.017)	0.024 (0.017)	0.030*** (0.005)	0.005 (0.007)	0.022 (0.015)	0.016 (0.012)	0.026 (0.018)
$\Delta NAVCF \times RORO_Index$	-0.903** (0.442)	-2.446*** (0.905)	-2.526** (0.981)	-1.125** (0.441)				
$\Delta NAVCF \times \Delta Broad_Dollar$					-0.020*** (0.007)	-0.021** (0.010)	-0.021*** (0.007)	-0.024*** (0.009)
RORO_Index	62.964 (68.167)	58.521 (67.788)	73.552 (89.595)	42.591 (65.713)				
$\Delta Broad_Dollar$					0.943 (8.098)	-3.200 (9.685)	0.222 (7.231)	-7.273 (7.666)
Pseudo R-squared	0.543	0.475	0.471	0.544	0.027	0.103	0.056	0.084
Country FE	Y	Y	Y	Y	N	N	N	N
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
N	10934	1508	1508	3856	9625	1677	3425	1677

References

Ang, Andrew, Chen, Bingxu, William Goetzmann and Ludovic Phalippou, 2018, Estimating Private Equity Returns from Limited Partner Cash Flows, *Journal of Finance*, 73, 1751-1783

Asis, Gonzalo, Anusha Chari and Adam Haas, 2020, In Search of Distress Risk in Emerging Markets, NBER Working Paper 27213

Baker, Malcolm, C. Fritz Foley and Jeffrey Wurgler, 2009, Multinationals as arbitrageurs: The effect of stock market valuations on foreign direct investment, *Review of Financial Studies*, 22, 337-369

Barber, Brad M. and Ayako Yasuda, 2017, Interim fund performance and fundraising in private equity, *Journal of Financial Economics*, 124, 172-194

Brown, Gregory W., Oleg R. Gredil and Steve Kaplan, 2016, Do private equity funds manipulate reported returns?, NBER Working Paper 22493

Chari, Anusha, Karlye Dilts-Stedman and Christian Lundblad, 2020, Capital Flows in Risky Times: Risk-on/Risk-off and Emerging Market Tail Risk, Working Paper, University of North Carolina at Chapel Hill

References ctd.

Datta, Deepa, Juan M. Londono, Bo Sun, Daniel Beltran, Thiago Ferreira, Matteo Iacoviello, Mohammad R. JahanParvar, Canlin Li, Marius Rodriguez, and John Rogers, 2017, Taxonomy of Global Risk, Uncertainty, and Volatility Measures. International Finance Discussion Papers 1216.

Demirogulu, Cem and Christopher M. James, 2010, The role of private equity group reputation in LBO financing, *Journal of Financial Economics*, 96, 306-330

Easton Peter D., Stephannie Laroque and Jennifer Sustersic Stevens, 2020, Private equity valuation before and after ASC 820, Working Paper, Available at SSRN: <https://ssrn.com/abstract=3314992> or <http://dx.doi.org/10.2139/ssrn.3314992>

Erel, Isil, Rose Liao and Michael S. Weisbach, 2012, Determinants of cross-border mergers and acquisitions, *Journal of Finance*, 67, 1045-1082

Ewens, Michael, Charles Jones, and Matthew Rhodes-Kropf, 2013, The price of diversifiable risk in venture capital and private equity. *Review of Financial Studies*, 26, 1854–1889.