Discussion of “Replicating Private Equity with Value Investing, Homemade Leverage, and Hold-to-Maturity Accounting” by Erik Stafford

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Summary

- 700 P2P transactions show that PE firms target primarily small caps and low EBITDA multiples

- If one forms a portfolio of similar listed companies, uses "hold-at-cost" accounting, and computes NAV-to-NAV quarterly returns, then both returns and stdev (hence the Sharpe ratio) matches that of the CA PE index

- Add fees to all this and PE looks like a poor performer

Literature

- Similar approach across papers:
  - Take all PE funds (10,000-20,000 underlying company investments)
  - Compute NPVs to see if beat a benchmark
  - Ignore intermediate NAVs – latest NAVs assumed to be close to market value (➔ no use of NAV-to-NAV returns)

Debate in the literature

- First papers used Thomson VE data → Seems that issue with the way the data were maintained, affects average performance results but key contributions seem robust:
  - E.g. persistence in Kaplan Schoar (2005), magnitude of fees in Phalippou Gottschalg (2009)

- Latest papers on performance find similar results across different datasets
- Debate is on the benchmark

Two camps

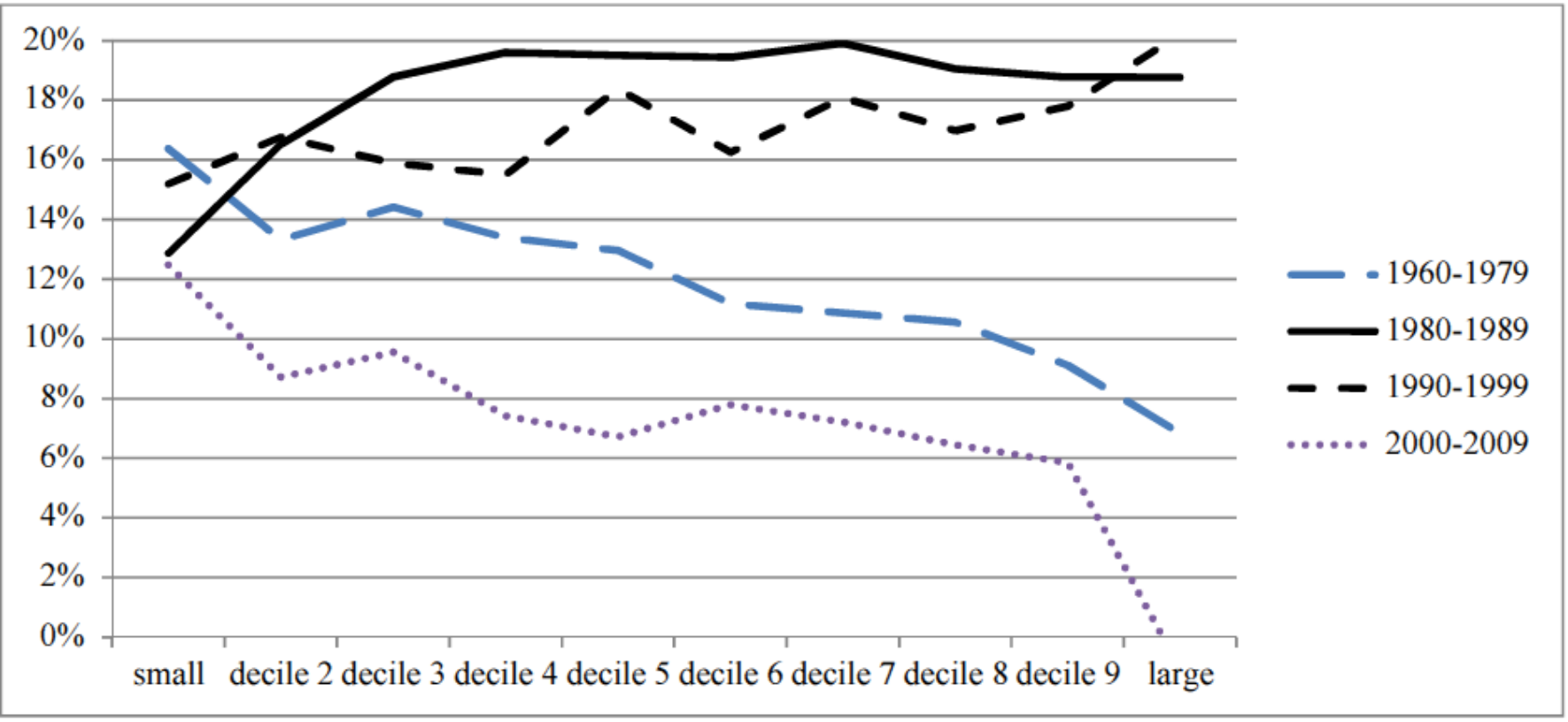
- Dominant (vast majority) says: S&P 500 is the benchmark, PE outperforms by 3% per annum. Does not matter what PE funds invest into, large institutional investors can only invest in S&P 500 or PE, not in mid cap

- Minority says the following:
  - Anything beats the S&P (at the time of these studies at least)
  - PE invests in small companies (with maybe extra tilt to value, low vol)
    - Shown using 10,000 investments Enterprise Values at entry
    - Shown using different statistical techniques from fund cash flows
  - Investing in factors seems feasible for large institutions, but either way need to use this as a benchmark and do a TC analysis to see the threshold at which one goes via the private instead of the public route

The size premium is strong over the sample period of dominant camp studies

Figure 1: Annualized average value-weighted return of the Fama-French size portfolios

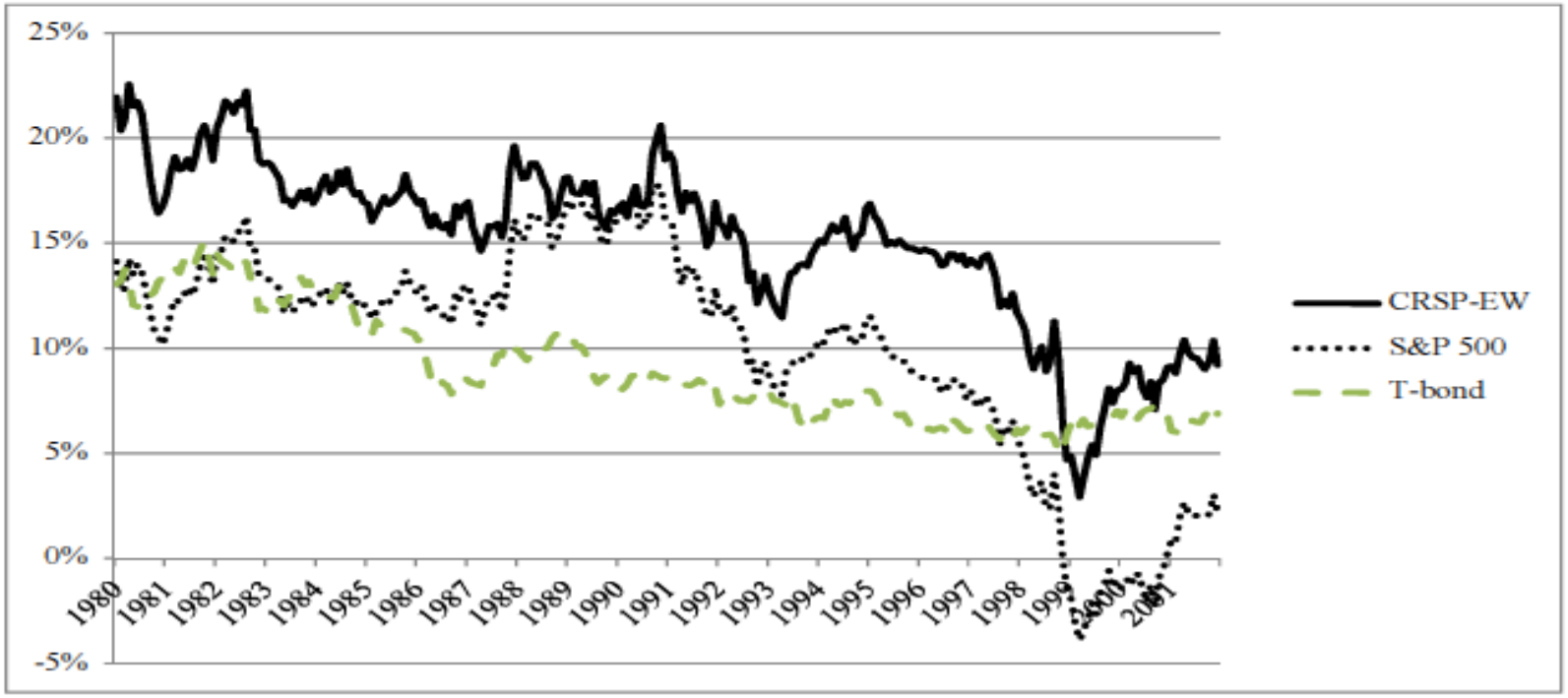
This figure plots the average monthly return (annualized) of the ten size-deciles portfolios of Fama-French. The data is broken down by time periods: 1960-1979, 1980-1989, 1990-1999, 2000-2009. Source: Ken French website.



Yes it is

Figure 2: Annualized Ten Year Forward Looking Moving Average Returns

Each point is calculated as the average monthly return over the next 120 months. The average monthly return is annualized. Data are from January 1980 to December 2011. The ten year forward-looking moving average is thus from January 1980 to December 2001. The CRSP equally-weighted index measures the return of the average US stock (CRSP-EW). CRSP-EW and S&P 500 returns are obtained from WRDS (Select CRSP dataset, Index/S&P 500 indexes, monthly, returns include distributions). 10 year Treasury bond monthly returns are also obtained from WRDS (select CRSP dataset, Index/Treasury, annual frequency, return, 10 year bond).



PME with small cap benchmarks

Benchmark	Mutual funds		CRSP US stock-market indices		Fama-French Size decile portfolios			
	Vanguard S&P 500	DFA Micro-cap	Value weighted	Equally weighted	Decile 1	Decile 3	Decile 5	Decile 10
Mean	1.20	1.04	1.19	1.03	1.02	1.01	1.03	1.23
Median	1.13	0.99	1.12	0.99	0.98	0.96	0.98	1.16
Std-error	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
t-stat	*8.62*	*1.83*	*8.21*	*1.53*	*1.12*	*0.52*	*1.32*	*9.69*

- A PME of one indicates equal returns
- Use of mutual fund data avoids issues with small stock return measurement biases
- DFA micro -cap has $3.6 billion asset under management and max market cap is $1,130 (higher than 95th largest PE transaction)

Best performing mutual fund is

Vanguard US Equity Index Inc (GBP) | ★★★★★ | Gold

Growth Of 1000 (GBP) 31/03/2017

- Fund: Vanguard US Equity Index Inc (GBP)
- Category: US Large-Cap Blend Equity
- Index: Russell 1000 TR USD

Annual Returns 31/03/2017

	2010	2011	2012	2013	2014	2015	2016	31/03
Price Return	20.53	1.20	10.70	30.28	18.95	5.94	33.86	4.44
+/- Category	5.69	2.87	2.93	1.52	1.33	1.92	3.26	0.16
+/- Index	0.78	-1.06	-0.61	-0.36	-1.33	-0.83	0.20	-0.33
% Rank in Category	5	27	11	28	40	30	16	47

Source: Morningstar

But 35% in Tech and Financials

Name	Sector	Country	% of Assets
Apple Inc		United States	2.91
Microsoft Corp		United States	1.98
Exxon Mobil Corp		United States	1.34
Amazon.com Inc		United States	1.33
Johnson & Johnson		United States	1.33
Berkshire Hathaway Inc B		United States	1.30
JPMorgan Chase & Co		United States	1.29
Facebook Inc A		United States	1.26
General Electric Co		United States	1.05
Wells Fargo & Co		United States	1.04

Source: Morningstar

New take on performance in private equity

- This paper look at the question from a different point of view: can one replicate private equity returns by investing in public stocks?

Comment 1

- But practitioners do not focus on NAV-to-NAV returns
- And academics never do so

Pension Fund Private Equity Performance (as of September 30, 2012)

Pension Fund Returns (Time-Weighted Return)[1]	1-Year	3-Year	5-Year	10-Year
California Public Employees' Retirement System	1.5%	17.2%	4.9%	10.5%
Colorado Public Employees' Retirement Association	3.3%	14.2%	4.3%	N/A
Connecticut Retirement Plans and Trust Funds	6.0%	14.0%	6.0%	8.3%
Illinois Municipal Retirement Fund	3.1%	7.1%	1.9%	N/A
Minnesota State Board of Investment	6.1%	14.1%	5.6%	14.5%
New Jersey Division of Investment	5.7%	11.9%	3.0%	N/A
Oregon Public Employees' Retirement System	4.2%	16.0%	4.9%	N/A
Pennsylvania Public School Employees' Retirement System	5.9%	14.6%	4.8%	13.0%
Teachers' Retirement System of Louisiana	7.7%	12.7%	3.1%	13.3%
Teacher Retirement System of Texas	6.4%	16.5%	N/A	N/A
Virginia Retirement System	7.6%	14.8%	4.7%	13.2%
Washington State Investment Board	8.6%	15.2%	1.5%	12.1%

Public Market Returns	1-Year	3-Year	5-Year	10-Year
Russell 3000 Index (including dividends)	30.2%	13.3%	1.3%	8.5%
S&P 500 Index (excluding dividends)	27.3%	10.9%	-1.2%	5.9%
S&P 500 Index (including dividends)	30.2%	13.2%	1.1%	8.0%

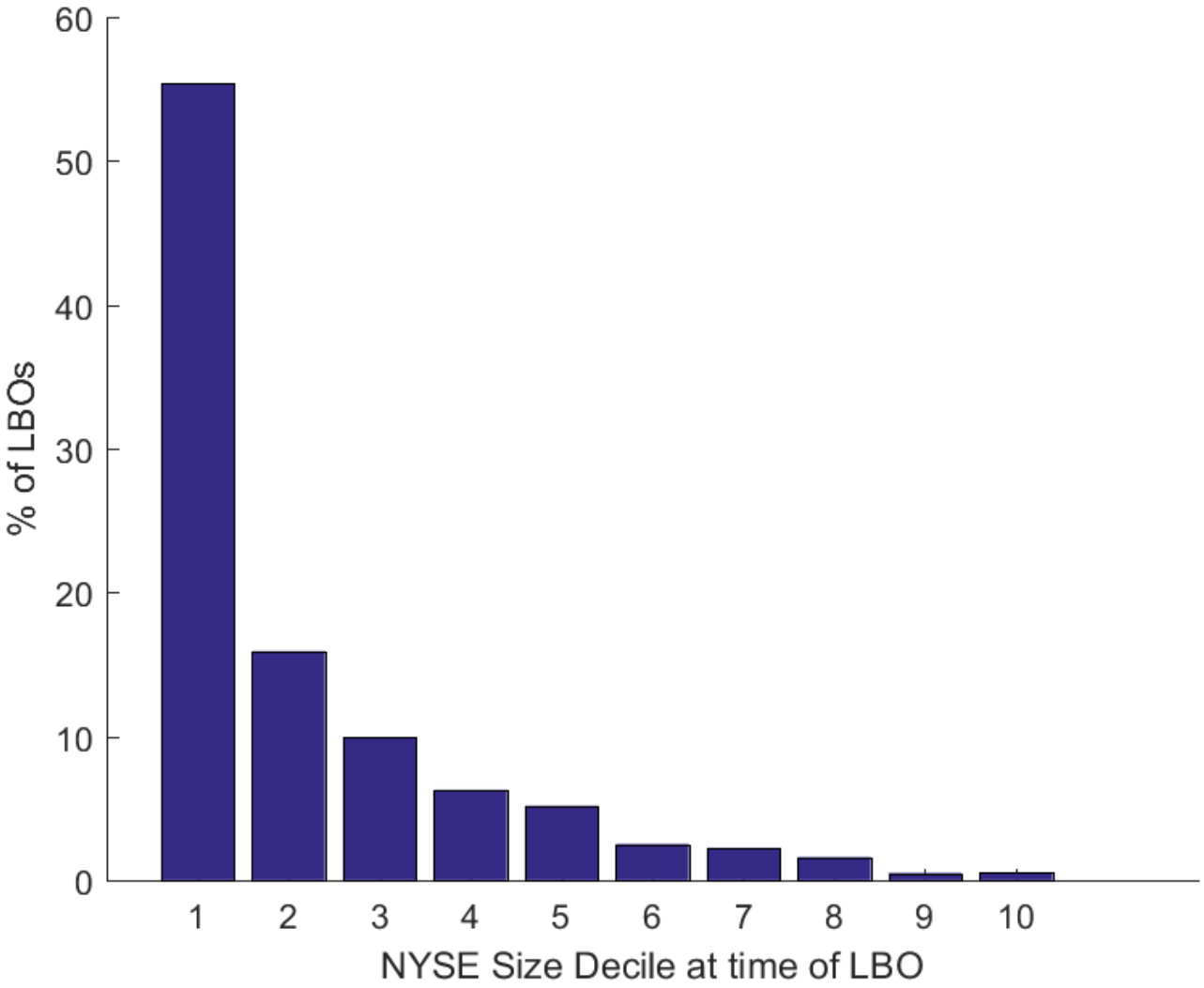
(Performance figures are based on most recent publicly available information.)

Comment 2

- Several papers (starting in the 1990s) have already looked at characteristics of targeted companies in P2P transactions
  - Are previously stat signif var gone if use size and ebitda multiple? Size was already there in these studies

- P2Ps are very special transactions and represent only 5% (at best) of all LBOs. The change in results from 1990s and 2000s could be a result of P2Ps becoming less prominent and of different nature
- What's wrong with using Capital IQ like nearly all recent PE studies?

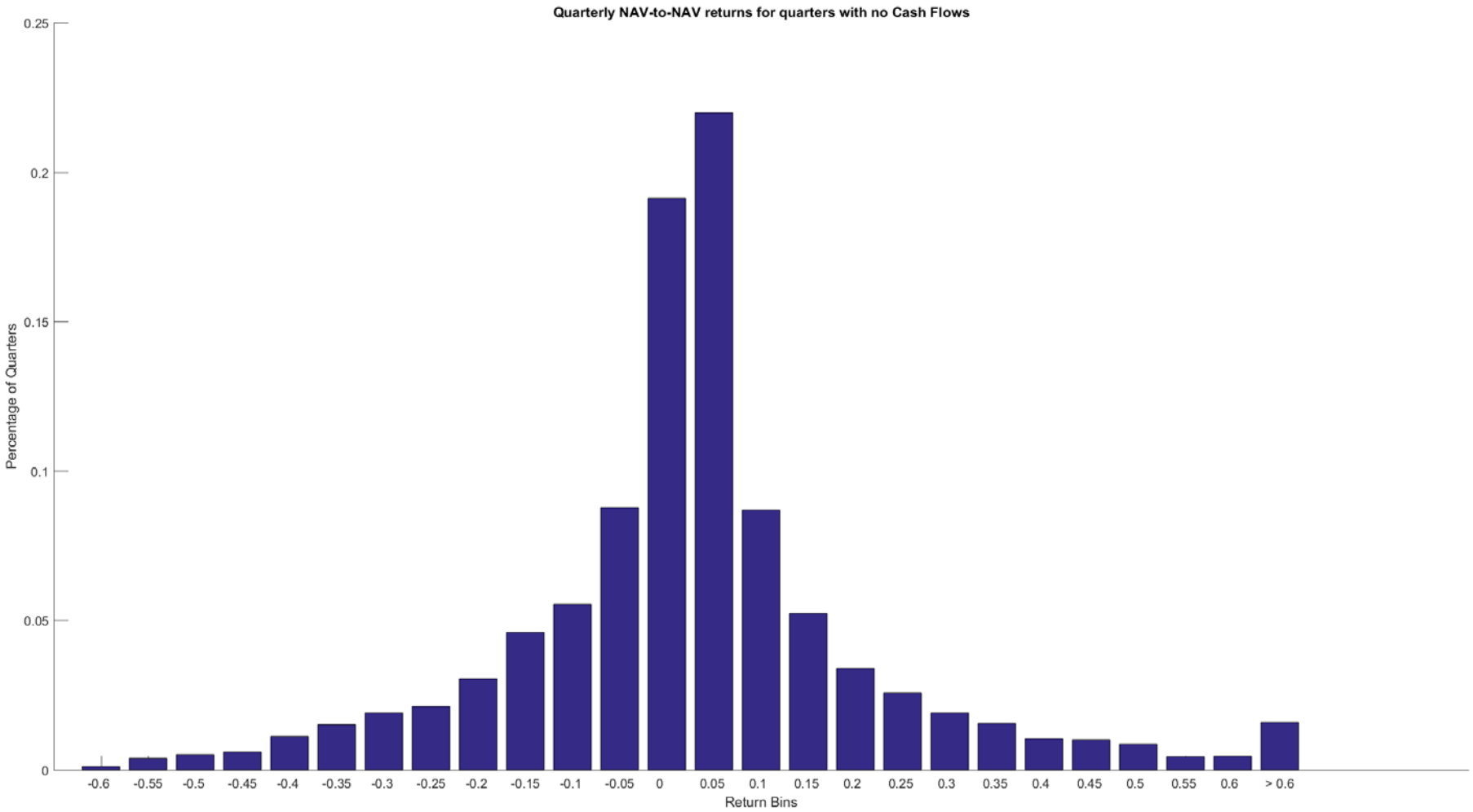
LBOs primarily target small firms (Capital IQ, about 3079 US LBOs)



Comment 3

- Assuming an accounting rule is tricky, bound to be arbitrary, but again
  - One can get some large sample basic empirical evidence on this

NAVs are frequently updated absent any investments or exits



Comment 3

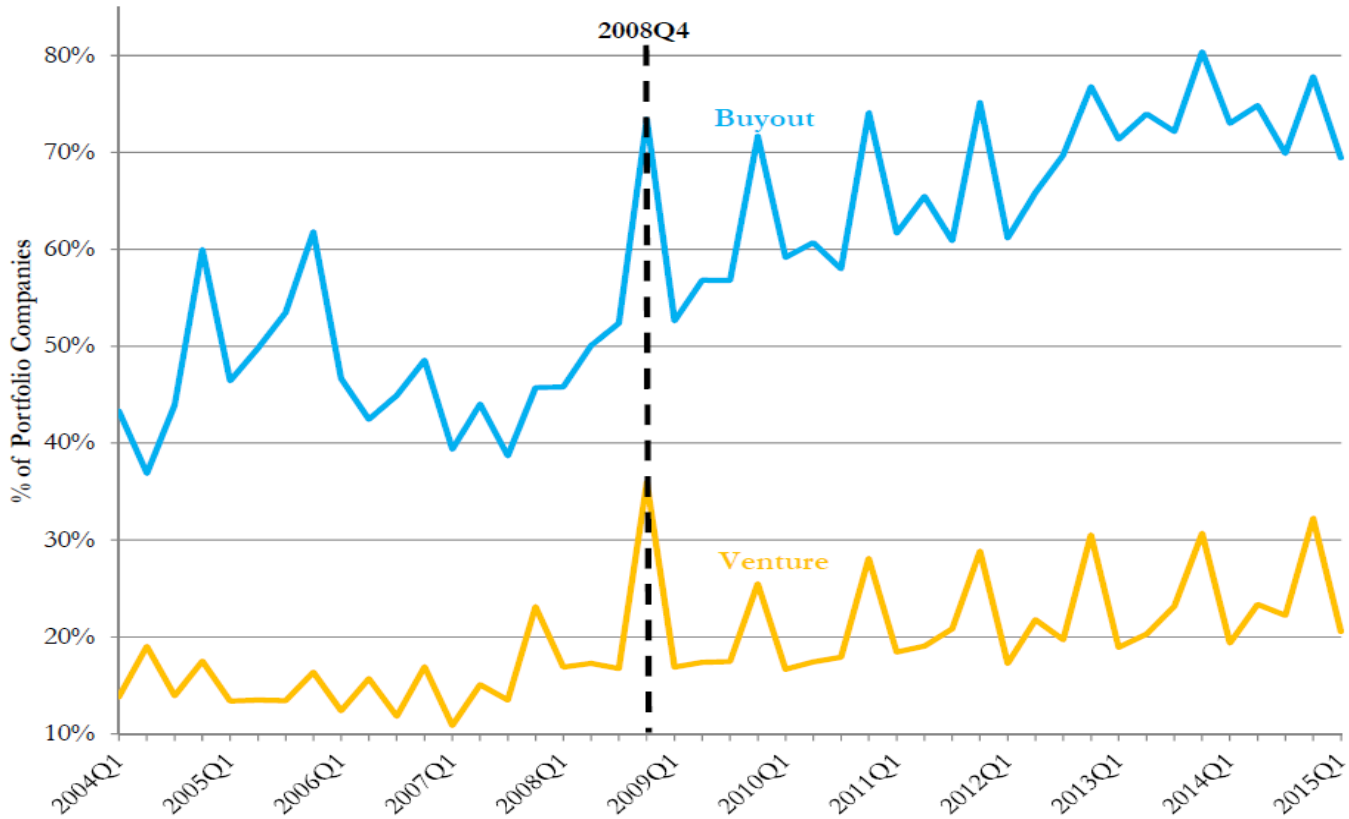
- Assuming an accounting rule is tricky, bound to be arbitrary, but again
  - One can get some large sample basic empirical evidence on this
  - There are papers documenting exactly that (#IgnoreLiterature)

Accounting stuff

- The accounting rule employed in the paper is similar to historical practice, but fair value measurement (FAS 157) was introduced in 2008
  - Crain and Law (2016) find improvements in valuation accuracy
  - Jenkinson, Landsman, Rountree and Soonawalla (2016) find that NAVs converge to the future cash flows early in the fund life
  - Simple statistics:
    - For the CA index, the autocorrelation is as follows (NB: pre 1999 there are few obs, purely backfilled in CA, and that may influence volatility of quarterly NAVs):
      - 2000 - 2008: 0.422
      - 2009 - 2016: 0.069

Figure 1
Frequency of Update Valuations

The figure plots the percentage of portfolio companies with updated valuations each quarter over the period from 2004 to 2015. Valuation refers to the valuation of a portfolio company plus the net cash flow in quarter *t*, divided by the valuation of the portfolio company in quarter *t*-1. The update valuations for investments held by buyout funds are depicted in blue, while for venture capital holdings they are depicted in orange. A reference line in 2008Q4 indicates the quarter that fair value accounting was implemented under accounting standard FAS 157. Realization events (such initial public offerings, company sales, or liquidations) are excluded.

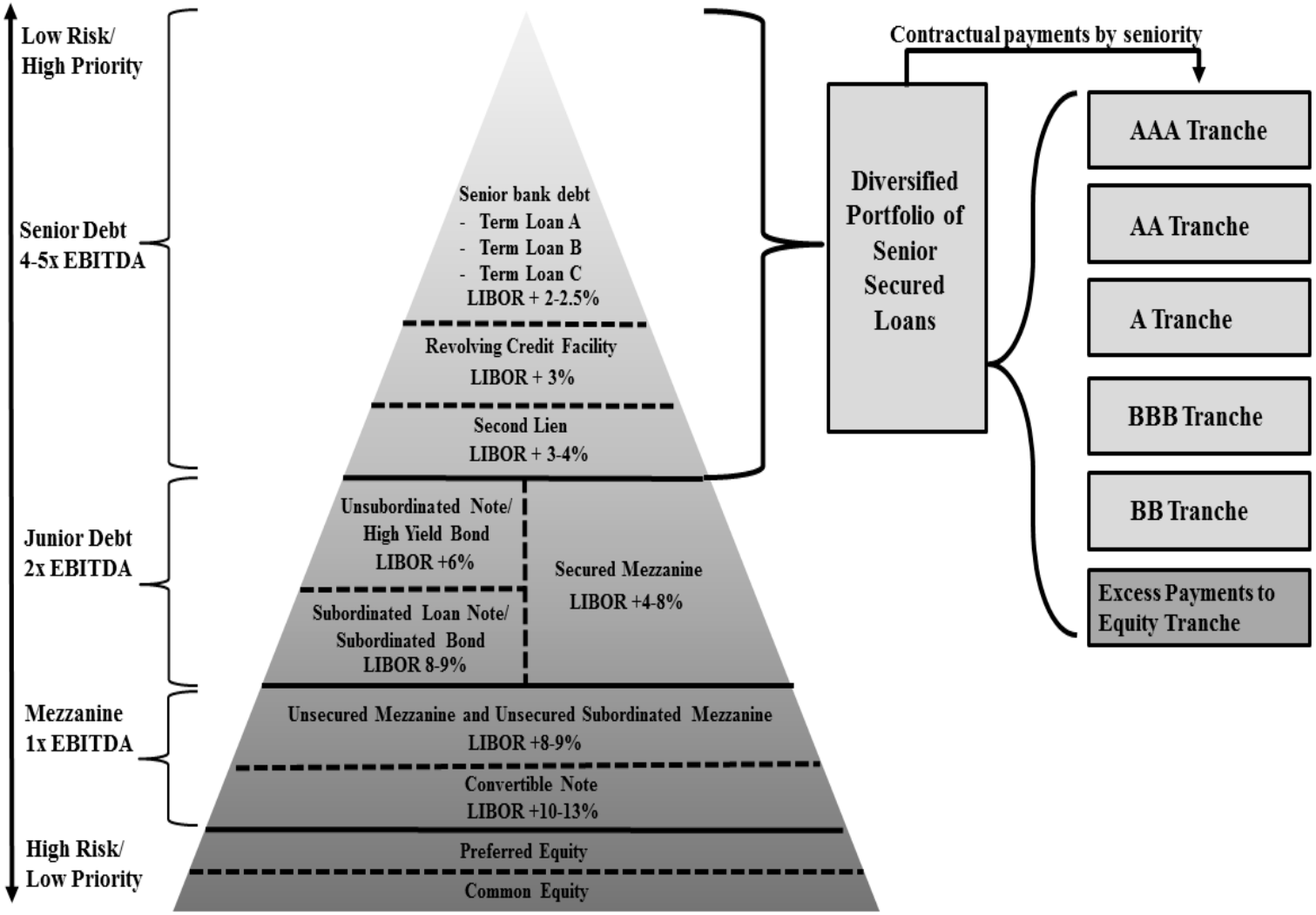


Crain and Law (2016)

Comment 4

- Assuming the effect and cost of leverage is tricky, bound to be a bit arbitrary, but again
  - One can get some simple empirical evidence on this and study the literature, for example:
    - Hotchkiss, Smith and Stromberg (2014) show that compared to companies with similar leverage, PE-backed companies do not go bankrupt more frequently
    - Case study on Hilton hotels: 80% leverage, June 2007, generates highest capital gain ever due to cov-lite loans + restructuring

LBO capital structure



Replicating Portfolio exhibit extreme risk

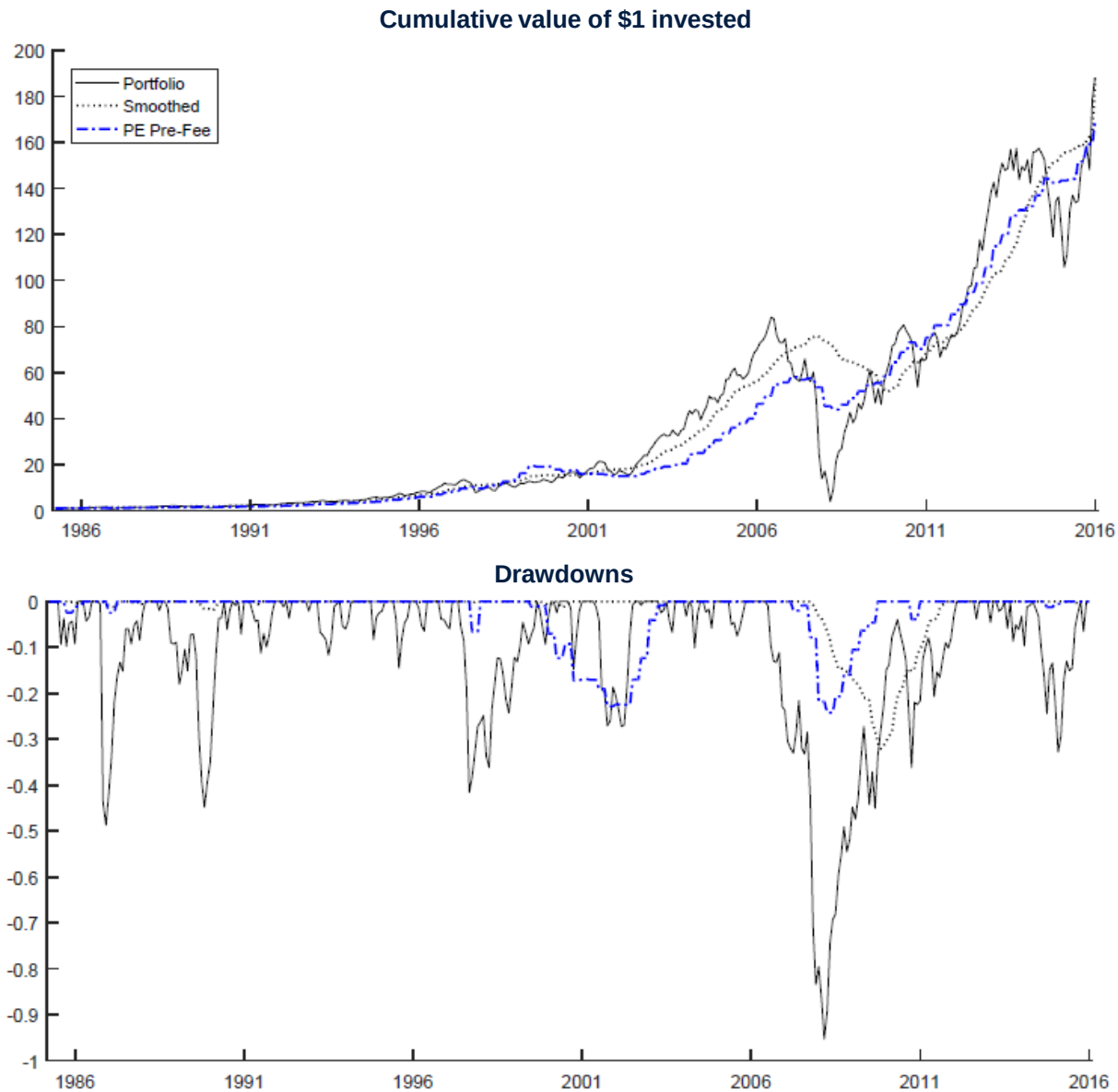
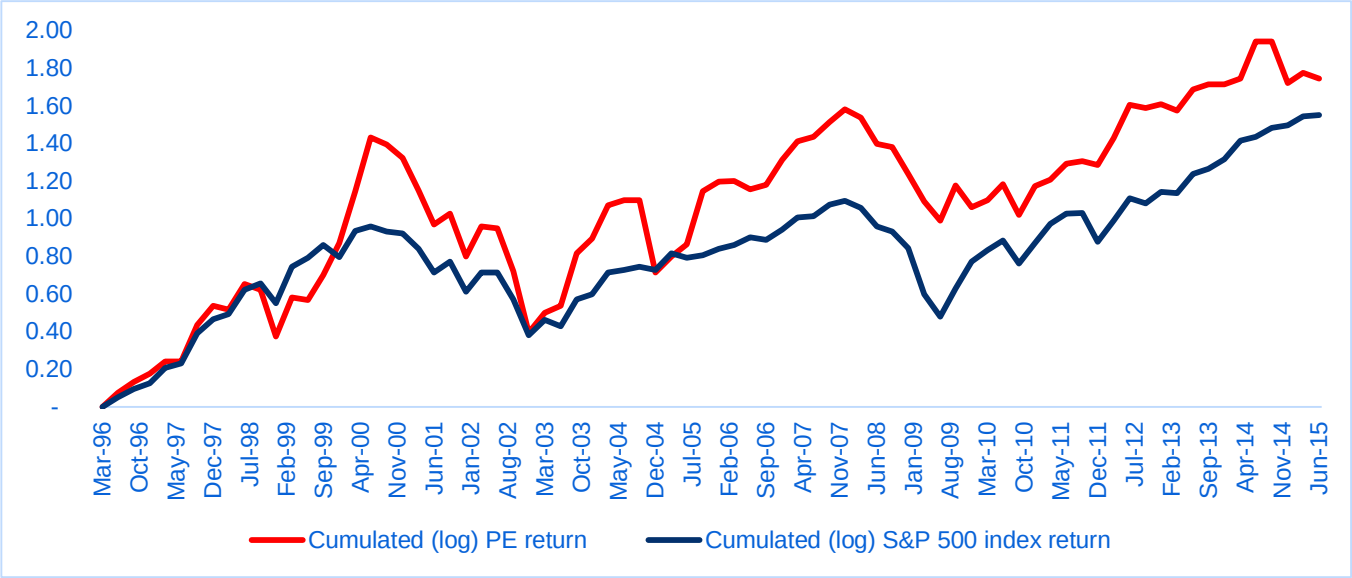


Figure 3. Realized risks and returns of the replicating portfolio (1986Q2 to 2016Q4).

Estimated return series for private equity do not show such extreme downside risk



Source: Ang, Chen, Goetzmann & Phalippou (2017; Journal of Finance, forthcoming)

Comment 5

- How investable is this strategy?
  - How high are transaction costs for small value stocks?
  - $2.49 trillion of assets under management in PE as of June 2016
    - Is that a feasible amount to deploy in small value stocks?
- The margin position is assumed to be risk-free
  - Yet, replicating portfolio is almost wiped out during the financial crisis
  - Ivashina and Kovner (2011) show that the median buyout fund pays 3 percentage points above LIBOR. And they get a great deal because it is a repeated game.

Comment 6

- Impact of fees: Assumed to be 1%-20% with 8% HWM
- But this is a hedge fund fee structure not a PE one!?
- Consequence: fees are said to be 3.5% to 5% annually while there are around 7% according to the literature (#IgnoreLiterature)
- Main PE fee features missed here: fee is on capital committed, there is no HWM because of 100% catch up provisions, there are front load fees, and there are portfolio company fees

Comment 7

- Alternative to matching index properties, simulate PE fund performance distributions by investing in similar companies as a synthetic PE fund
  - Take timings of investments and exits from cash flow data, and invest in random similar companies at the time
  - Can such synthetic funds generate a similar distribution of TVPI/PME as PE funds do? Is it more/less dispersed?
  - Close to something the literature has done, but could be good to see nonetheless

Take away

- Private Equity is big deal
- Even fundamental questions are not clearly answered yet
- Welcome to the minority camp!
  - My tip: May want to avoid choices that are contradicted by the literature because it gives easy bullets to critics, and key message (which is correct and robust) then gets dismissed
- Enjoy