



PitchBook Benchmarks

PRIVATE MARKETS

DATA THROUGH 3Q 2017



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Introduction

PitchBook Benchmarks aim to help both limited partners (LPs) and general partners (GPs) better understand private market fund performance relative to broader asset classes and other PE and VC strategies. Performance is presented through several lenses—including IRRs and cash multiples—to provide a holistic view for assessing performance within and between strategies, as well as across vintage years. Furthermore, the alpha of private market funds is measured relative to easily accessible public market substitutes using a public market equivalent (PME) metric.

Each edition of our Benchmarks will include a section that highlights a specific aspect of fund performance. In this version, we investigate one of the timeless questions for private capital funds: Does performance persistence exist? Our analysis reveals a relatively high level of quartile persistence across funds, corroborating previous research; however, regressions of net IRRs among subsequent funds in a Fund Family did not show a strong correlation in returns. As with most areas of private markets, performance persistence is nuanced, but the data does provide insight into how a GP's performance changes over time.

We strive to maintain consistency in each edition of PitchBook Benchmarks, but fund classifications will change occasionally and new funds will be incorporated into the dataset as we gather additional information. Since last quarter, we have added more than 140 private capital funds to our Benchmarks.

Below you'll find detailed benchmark statistics across PE, VC, debt, real assets, funds-of-funds and secondaries strategies. To easily access all of the data points found in this PDF, along with benchmark statistics for a host of other sub-strategies and geographies, be sure to download the accompanying Excel data packs ([PE](#), [VC](#), [Debt & Real Assets](#) and [Alternative Access Strategies](#)). Through these data packs, subscribers to the PitchBook Platform can also gain direct access to all the underlying funds and performance metrics used to calculate our Benchmarks.

Our goal is to provide the most transparent, comprehensive and useful fund performance data for private market professionals. We hope that our Benchmarks prove useful in your practice, and we welcome any and all feedback that may arise as you make your way through our various benchmark groupings. Should there be any additional benchmark categories or data points you would like to see included in the future, please contact us directly at benchmarks@pitchbook.com.

Methodology

Data Composition

PitchBook's fund returns data is primarily composed of individual LP reports, serving as the baseline for our estimates of activity across an entire fund. For any given fund, return profiles will vary for LPs due to a range of factors, including fee discounts, timing of commitments and inclusion of co-investments. This granularity of LP-reported returns—all available on the PitchBook Platform—provides helpful insight to industry practitioners but results in discrepancies that must be addressed when calculating fund-level returns.

To be included in pooled calculations, a fund must have: (i) at least one LP report within two years of the fund's vintage, and (ii) LP reports in at least 45% of applicable reporting periods. To mitigate discrepancies among multiple LPs reporting, the PitchBook Benchmarks (iii) determine returns for each fund based on data from the most frequently reporting LP. If (iv) that LP's reports are not available for a particular quarter, data from the next-most consistent reporter is used. Employing this methodology, data from the most consistent reporting LP is used more than 90% of the time. For periods that lack an LP report, (v) a straight-line interpolation calculation is used to populate the missing data; interpolated data is used for approximately 10% of reporting periods. All returns data in this report is net of fees.

Definitions

Vintage year:

The vintage year is based on the year of first investment. If year of first investment is unknown, the year of the final close is used as the vintage year. However, if a firm publicly declares via press release or a notice on their website a fund to be of a particular vintage different than either of the first conditions, the firm's classification takes precedence.

Internal rate of return (IRR):

IRR represents the rate at which a series of cashflows are discounted so that the net present value of cashflows equals zero. For fund-level IRRs, any remaining value in the fund is treated as a distribution in the most recent reporting period. This explains why some vintages show high IRRs but low DPI values.

Distributions to paid-in (DPI):

A measurement of the capital that has been distributed back to LPs as a proportion of the total paid-in, or contributed, capital. DPI is also known as the cash-on-cash multiple or the realization multiple.

**Remaining value to paid-in (RVPI):**

A measurement of the unrealized return of a fund as a proportion of the total paid-in, or contributed, capital.

Total value to paid-in (TVPI):

A measurement of both the realized and unrealized value of a fund as a proportion of the total paid-in, or contributed, capital. Also known as the investment multiple, TVPI can be found by adding together the DPI and RVPI of a fund.

Fund count:

Some funds in our dataset have cashflow data but no reported IRR figure. We do not calculate individual fund IRRs using quarterly cashflows, which means the sample sizes may differ for pooled calculations and median calculations.

Methodology

Median calculations:

Shows the middle data point for a sample group.

Pooled calculations:

All cashflows and NAVs for the sample group are aggregated in the calculation. For vintage-specific calculations, we begin the calculation in 1Q of the vintage year. In cases where the sample has unrealized value, the ending NAV is treated as a cash outflow in the last reporting period.

Equal-weighted pooled calculations:

Each fund's cashflows and ending NAV are expressed as a ratio of fund size. Each fund's ratios are then used to compute pooled calculations for IRR and cash multiples using the methodology outlined above. Regardless of fund size, each fund in these calculations has an equal impact on the output.

Horizon IRR:

Horizon IRR is a capital-weighted pooled calculation that shows the IRR from a certain point in time. For example, the one-year horizon IRR figures in this report show the IRR performance for the one-year period beginning in 4Q 2016 through the end of 3Q 2017, while the three-year horizon IRR is for the period beginning in 4Q 2014 through the end of 3Q 2017.

Standard deviation:

Calculated using the sample-based standard deviation methodology.

Public market index returns:

Instances where the return of a public market index is cited, we have calculated the annualized return for the given period. All public indices are total return and denominated in US dollars.



Public market equivalent (PME) calculations:

PME metrics benchmark the performance of a fund (or group of funds) against an index. A white paper detailing the calculations and methodology behind the PME benchmarks can be found at pitchbook.com. PitchBook News & Analysis also contains several articles with PME benchmarks and analysis. These can be read [here](#). All PME figures are calculated using the Kaplan-Schoar PME method:

$$PME_{KS-TVPI, T} = \frac{\frac{NAV_T}{I_T} + \sum_{t=0}^T \left(\frac{\text{distribution}_t}{I_t} \right)}{\sum_{t=0}^T \left(\frac{\text{contribution}_t}{I_t} \right)}$$

When using a KS-PME, a value greater than 1.0 implies outperformance of the public index (net of all fees).

Fund Classifications

Private Equity

- Buyout
- Growth/Expansion
- Mezzanine
- Restructuring/Turnaround
- Diversified PE

Debt

- Direct Lending
- Bridge Financing
- Distressed Debt
- Credit Special Situations
- Infrastructure Debt
- Venture Debt
- Real Estate Debt

Real Assets

- Real Estate Core
- Real Estate Core Plus
- Real Estate Distressed
- Real Estate Opportunistic
- Real Estate Value Added
- Energy
- Infrastructure
- Timber
- Mining

Venture Capital

Secondaries

Fund-of-Funds



Case Study: Performance Persistence

- Performance persistence is observable in both PE and VC funds, with the highest level of persistence occurring at the ends of the return distribution. Funds that deliver top-quartile performance are followed by a top-quartile successor fund 39% and 34% of the time for PE and VC, respectively.
- In addition to observing broad-based performance persistence, we found that the level of persistence rises as a firm raises additional funds for a particular strategy. When examining performance trends from the second to third funds in a Fund Family, we find that 43% of top-quartile PE funds are followed up by another top-quartile fund. That figure jumps to 55% for VC funds.
- While we observed a considerable amount of persistence in the quartile performance from one fund to the next—particularly on the ends of the distribution—regressions of net IRRs among subsequent funds in a Fund Family did not show a strong correlation in returns.

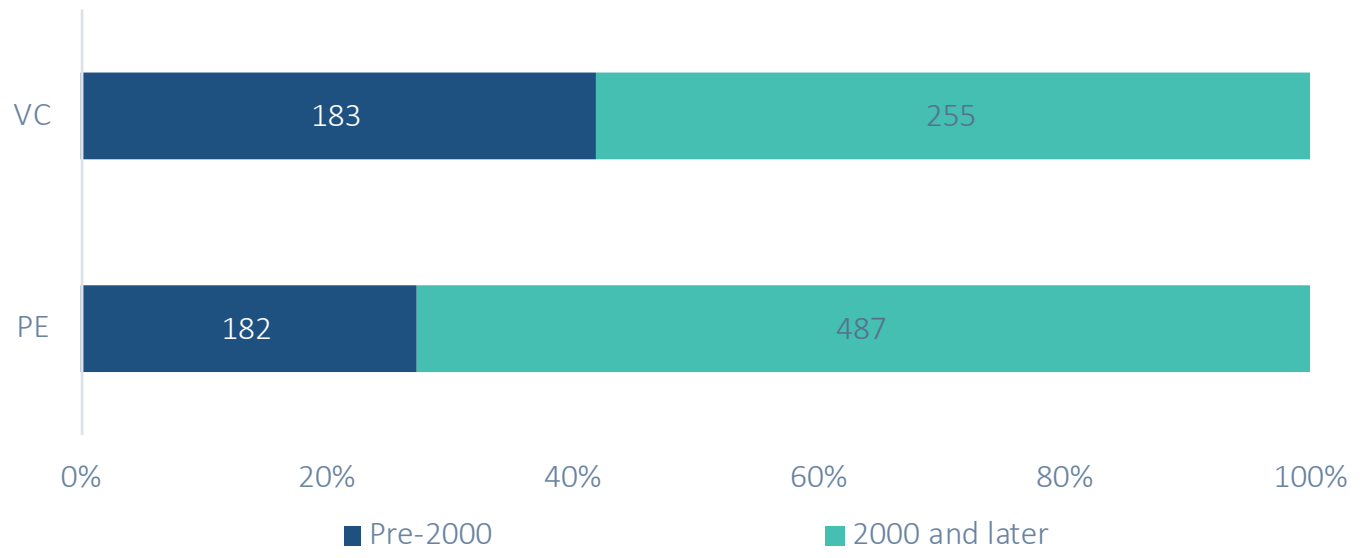
Is the past prologue?

The phrase “past performance does not guarantee future results” has become so ubiquitous in investment memoranda that few investors are likely to notice it in the footnotes. And while most investors have that maxim embedded somewhere in their mental investment framework, when it comes to investing in active managers, past performance is virtually always one of the first things considered. But should it be? One

of the timeless questions for private capital funds is whether performance persistence exists. The answer has major implications for capital allocators.

Academics have come to mixed conclusions. The most prominent paper, *Has Persistence Persisted in Private Equity?*, found persistence for pre-2000 PE and VC funds, but the story changed when they examined more recent funds. After 2000, the researchers “find little evidence of persistence for buyout funds, except at the lower end of the performance distribution” but that “performance in venture capital funds remains as persistent as pre-2000.” Using PitchBook’s fund performance data, we investigated these conclusions and explored other areas that could provide insight into how a general partner’s (GP’s) performance changes over time.

Funds pairings (#) by vintage year of first fund



Source PitchBook. *As of September 30, 2017

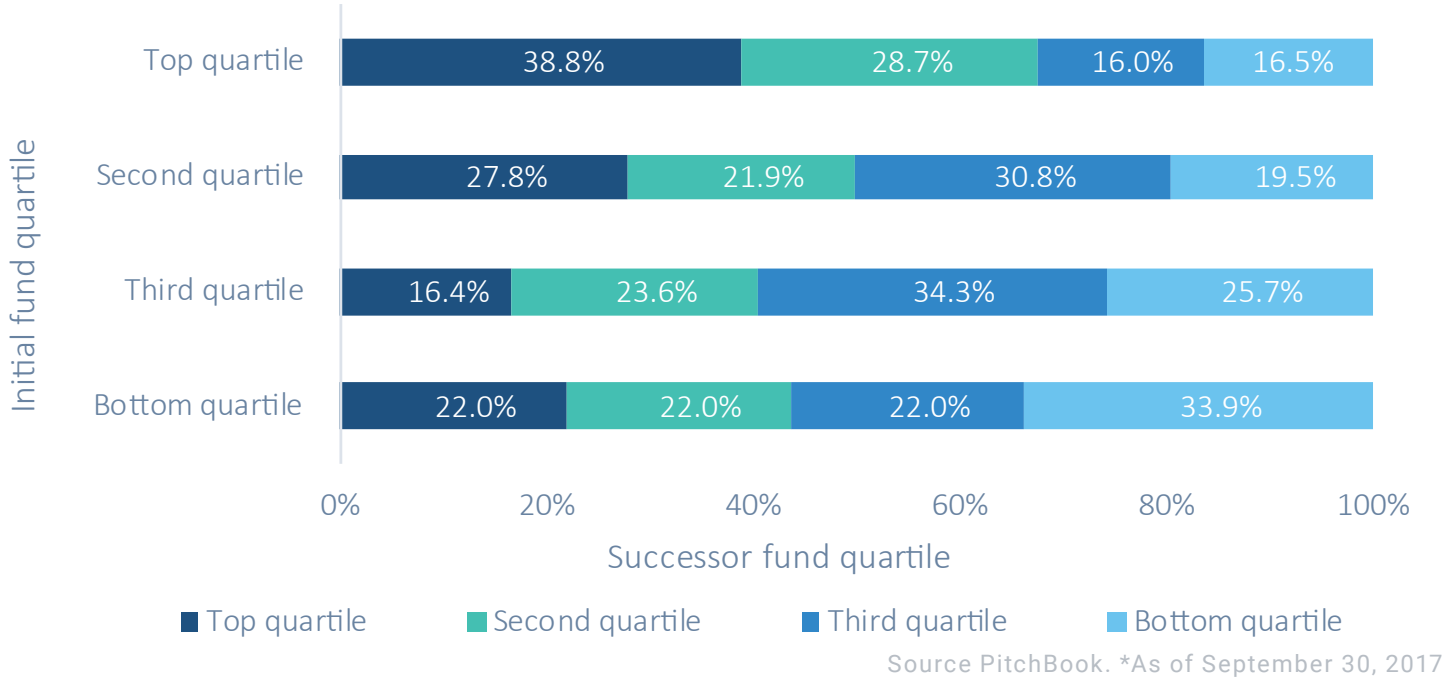
All in the family

For this analysis, we have bucketed funds into “Fund Families” to account for the different investment strategies managed by a single GP. For example, if a manager has both buyout funds and private debt funds, performance persistence is measured separately for the two strategies. The same goes for differences in geography and various sub-strategies of PE (e.g. energy, secondaries, growth). A total of 1,107 fund relationships (669 PE and 438 VC) are included in this analysis. Our PE and VC peer groups have a similar number of fund relationships in which the initial fund is pre-2000, but the number of new PE fund relationships (487) is significantly higher than in VC (255).

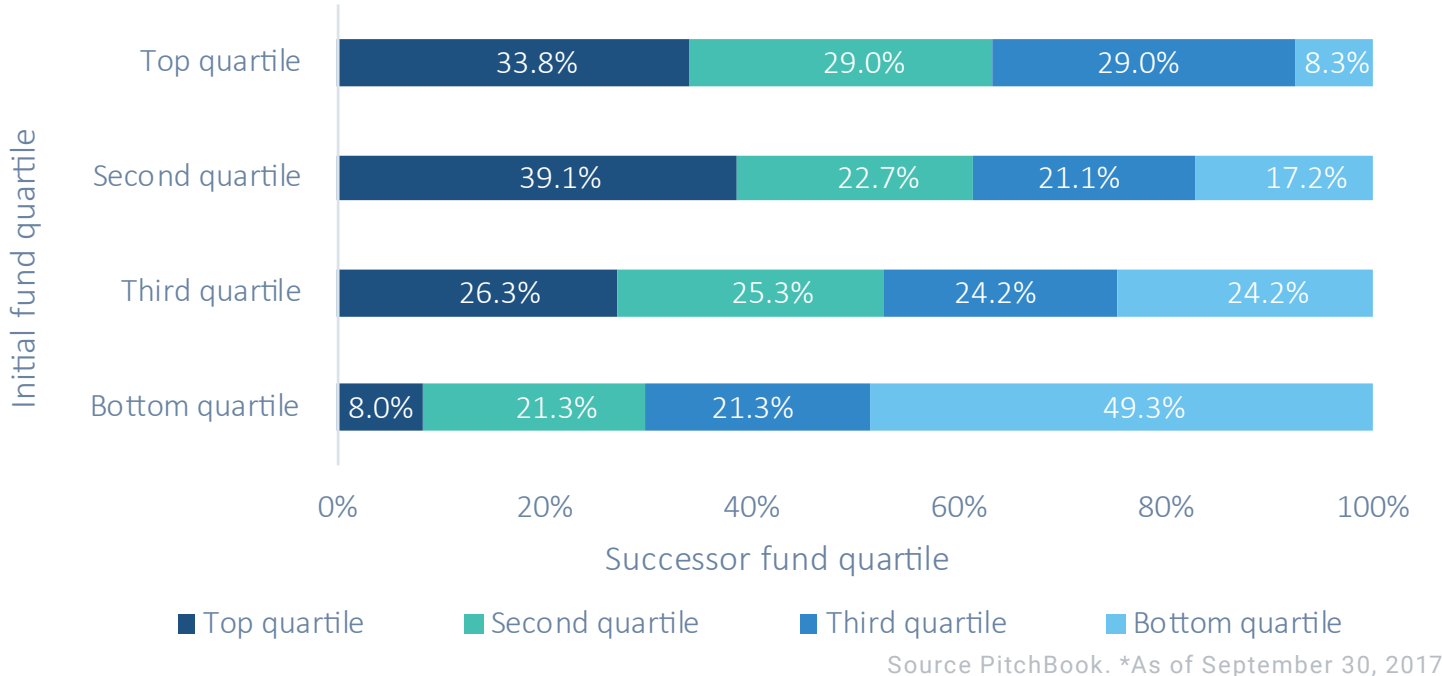
If performance from one fund to the next were random, 25% of top-quartile funds would produce a top-quartile successor. In fact, that figure comes out to 39% for PE, suggesting a high degree of persistence in top performers. We find that the inverse is true as well, with 34% of bottom-quartile funds being followed by another bottom-quartile fund. Furthermore, 67% of top-quartile funds led to a subsequent fund with above-median returns.

The story is similar for VC, with top-quartile funds spawning a successor fund in the top quartile 34% of the time. Persistence is even more pervasive in the bottom end of the return distribution, with 49% of bottom-quartile funds being followed by another bottom-quartile vehicle.

PE fund IRR quartile persistence



VC fund IRR quartile persistence





In addition to observing broad-based performance persistence, we found that the level of persistence rises as a firm raises additional funds. When examining performance trends from the second to third funds in a Fund Family, we find that 43% of top-quartile PE funds are followed up by another top-quartile fund. That figure jumps to 55% for VC funds. For comparison, the top-quartile persistence from the first to second funds is 38% and 26% for PE and VC, respectively. We attribute this finding to the built-in survivorship bias inherent in this data; if a GP can raise at least three funds for a given strategy, it's a strong sign that limited partners have observed traits (including strong prior performance) that led them to believe the GP can continue to generate strong returns into the future. We believe this feedback loop is likely to be particularly strong in VC, where performance is more dependent on accessing strong performance outliers, because a dealmaker's reputation leads directly to high-quality, in-bound investment opportunities.

Interestingly, we find that persistent underperformance also exists, suggesting that LPs are providing subpar GPs more leeway than may be warranted. Indeed, when the second fund in a Fund Family falls into the bottom quartile, the GPs' third fund will also be bottom quartile 34% of the time for PE and 44% of the time for VC.

While we observed a considerable amount of persistence in the quartile performance from one fund to the next—particularly on the ends of the distribution—regressions of net IRRs between subsequent funds in a Fund Family did not show a strong correlation in returns. We expected to find some correlation in this regard, but this finding is not entirely surprising considering that PE fund performance metrics vary greatly depending on the vintage. A 2006 buyout fund with IRR of 11.3% would be in the top quartile, for instance, while that same level of performance for a 2001 fund would put it on the cusp of the bottom quartile.

Set it and forget it?

Even though persistence is not absolute, this data seems to suggest that LPs would be well-served to scrutinize past performance in their consideration of future fund commitments; however, there are several caveats to consider.

First, a certain number of managers will inevitably encounter challenges from one fund to the next. So, even when recommitting to a manager, LPs must conduct thorough due diligence to ensure that the GP has taken the necessary measures to insulate themselves from performance pitfalls, including complacency, style drift and strategy obsolescence. This includes assessing the GP's culture and ability to retain talent.

Second, a propensity to reallocate to existing managers may come at the detriment of considering new and upcoming GPs. First-time funds have exhibited strong historical performance relative to follow-on funds, and top-performing first-time funds are likely to be the persistent performers of the future. If investors overlook nascent managers, they may not have the ability to find capacity in the manager's subsequent fundraises.

References

Harris, R. S., Jenkinson, T., Kaplan, S. N. and Stucke, R. (2014). Has persistence persisted in private equity? Evidence from buyout and venture capital funds (Darden Business School No. 2304808). Charlottesville, VA: Darden Business School.

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Fund Returns History

Period	Contribution £ (by all LPs)	Dry Powder £	Distribution £ (to all LPs)	NAV £	Total Fund £ Distr+NAV	IRR	DPI	RVPI	TVPI
2017	2,669,17	57,29	2,418,55	2,671,53	5,092,68	20,04%	0,90x	1,00x	1,91x
3Q17	2,572,54	458,21	3,089,00	2,262,00	5,350,99		1,07x	0,79x	1,86x
2Q17	2,669,14	57,66	2,421,07	2,671,15	5,092,97	19,84%	0,91x	1,00x	1,91x
1Q17	2,669,17	57,26	1,486,32	3,492,48	4,981,92	20,13%	0,56x	1,31x	1,88x
2016	2,647,36	166,31	1,482,77	3,299,39	4,782,16	20,19%	0,55x	1,25x	1,81x
4Q16	2,647,36	136,64	1,485,90	3,298,98	4,784,88	19,94%	0,56x	1,25x	1,81x

Date	Reported by/Limited Partner	IRR	DPI	RVPI	TVPI	Individual LP Committed	Individual LP Contributed	Dry Powder	Individual LP Distributed	Individual LP NAV	Individual LP Distr+NAV	Gain
31-Dec-2016	New York City Fire Department Pension Fund	20,60%	0,58x	1,21x	1,79x	28,46	28,44	0,02	16,60	34,36	50,96	
31-Dec-2016	New York City Police Pension Fund	20,60%	0,58x	1,21x	1,79x	66,40	66,07	0,33	38,39	80,18	118,56	
31-Dec-2016	Teachers' Retirement System of the City of ...	20,57%	0,57x	1,26x	1,82x	94,86	91,14	3,72	51,66	114,54	166,20	
31-Dec-2016	New York City Employees' Retirement System	20,40%	0,59x	1,19x	1,78x	94,86	96,28	0,00	57,10	114,54	171,64	
31-Dec-2016	Houston Municipal Employees' Pension Syst...	20,19%	0,56x	1,24x	1,80x	18,97	18,47	0,50	10,32	22,96	33,28	
31-Dec-2016	Maryland State Retirement and Pension Sys...	20,00%	0,51x	1,40x	1,91x	47,43	40,96	6,47	20,73	57,40	78,13	
31-Dec-2016	Indiana Public Retirement System	19,95%	0,52x	1,25x	1,89x	47,43	46,07	6,47	30,07	57,40	87,47	
31-Dec-2016	Los Angeles County Employees' Retirement ...	19,92%	0,55x	1,29x	1,83x	94,86	89,07	5,79	48,66	114,78	163,44	
31-Dec-2016	Teachers Retirement System of the State of ...	19,92%	0,51x	1,40x	1,91x	94,86	81,91	12,94	41,51	114,79	156,30	
31-Dec-2016	Massachusetts Pension Reserves Investmen...	19,92%	0,56x	1,25x	1,81x	142,29	138,19	4,10	77,57	172,19	249,77	
31-Dec-2016	Louisiana State Employees Retirement Syst...	19,92%	0,51x	1,40x	1,91x	33,20	28,62	4,58	14,48	40,18	54,66	
31-Dec-2016	Oregon Public Employees Retirement System	19,90%	0,56x	1,25x	1,81x	94,86	92,11	2,75	51,70	114,78	166,48	
31-Dec-2016	State of Wisconsin Investment Board	19,90%	0,56x	1,25x	1,81x	94,86	92,11	2,75	51,70	114,78	166,48	
31-Dec-2016	Baltimore County Employees' Retirement Sy...	19,72%	0,51x	1,39x	1,89x	9,49	8,18	1,29	4,13	11,34	15,47	
31-Dec-2016	Visiting Nurse Service of New York Care Pen...									1,05		
31-Dec-2016	New Jersey Division of Investment		0,61x	1,13x	1,74x	189,72	197,63	25,89	120,46	223,52	343,98	
31-Dec-2016	Los Angeles Department of Water and Powe...					23,71				28,01		
31-Dec-2016	New England Carpenters Guaranteed Annu...									2,74		
31-Dec-2016	New York State Teachers' Retirement System					71,14	61,44	9,71				

Period	Contribution £	Dry Powder £	Distribution £	NAV £	Total Fund £	IRR	DPI	RVPI	TVPI
3Q16	2,647,36	165,26	1,239,21	3,465,75	4,703,50	20,70%	0,47x	1,31x	1,78x
2Q16	2,628,21	243,02	1,232,89	3,459,80	4,692,73	21,92%	0,44x	1,32x	1,80x
1Q16	2,623,57	115,54	1,192,13	3,431,05	4,621,61	22,91%	0,45x	1,31x	1,76x
2015	2,453,71	294,63	1,004,40	3,294,89	4,269,12	23,02%	0,39x	1,34x	1,75x
2014	2,291,69	434,74	87,25	2,996,15	3,037,98	15,87%	0,04x	1,29x	1,33x

Private Capital



PRIVATE CAPITAL

Horizon IRRs

Strategy	1-Year	3-Year	5-Year	10-Year	15-Year	18-Year
Private Capital	14.03%	10.68%	12.51%	8.28%	10.67%	9.74%
Private Equity	17.53%	13.57%	14.78%	9.62%	13.00%	11.44%
Venture Capital	7.59%	8.98%	12.95%	8.02%	7.40%	5.95%
Real Assets	11.54%	7.58%	9.10%	5.25%	6.84%	6.95%
Debt	7.92%	5.17%	9.82%	7.94%	10.11%	10.23%
Fund-of-Funds	10.88%	10.18%	10.97%	7.06%	8.45%	7.26%
Secondaries	14.40%	13.50%	14.68%	12.76%	14.26%	12.68%
S&P 500	14.67%	9.18%	13.98%	7.38%	9.24%	5.29%
Russell 2000 Growth	14.60%	8.67%	13.67%	7.92%	10.93%	5.80%
Russell 3000	14.29%	8.96%	13.87%	7.47%	9.59%	5.77%
Morningstar US Real Assets*	-0.26%	-0.01%	0.75%	3.61%	6.72%	7.27%
Bloomberg Barclays US Corporate High Yield	7.25%	5.51%	5.82%	7.79%	9.21%	7.27%

*Index only dates back 17 years
Source: PitchBook
Data as of September 30, 2017

PRIVATE CAPITAL

Equal-Weighted Horizon IRRs

Strategy	1-Year	3-Year	5-Year	10-Year	15-Year	18-Year
Private Capital	11.39%	10.24%	11.56%	8.22%	9.58%	8.70%
Private Equity	15.24%	11.99%	12.49%	9.32%	12.45%	10.62%
Venture Capital	5.62%	7.88%	11.18%	7.41%	6.33%	5.64%
Real Assets	10.43%	9.39%	9.97%	6.12%	7.60%	7.68%
Debt	7.63%	5.94%	10.03%	7.70%	9.99%	9.98%
Fund-of-Funds	10.50%	11.40%	11.86%	8.83%	9.27%	8.40%
Secondaries	12.91%	9.19%	10.41%	8.80%	10.72%	10.59%
S&P 500	14.67%	9.18%	13.98%	7.38%	9.24%	5.29%
Russell 2000 Growth	14.60%	8.67%	13.67%	7.92%	10.93%	5.80%
Russell 3000	14.29%	8.96%	13.87%	7.47%	9.59%	5.77%
Morningstar US Real Assets*	-0.26%	-0.01%	0.75%	3.61%	6.72%	7.27%
Bloomberg Barclays US Corporate High Yield	7.25%	5.51%	5.82%	7.79%	9.21%	7.27%

*Index only dates back 17 years
 Source: PitchBook
 Data as of September 30, 2017

Private Equity

PRIVATE EQUITY

IRRs by Vintage

POOLED IRRS

IRR HURDLE RATES

Vintage Year	Pooled IRR	Equal-Weighted Pooled IRR	Number of Funds	Top Decile	Top Quartile	Median IRR	Bottom Quartile	Bottom Decile	Standard Deviation	Number of Funds
Pre-2001	11.23%	9.57%	174	22.94%	15.80%	9.92%	2.73%	-6.20%	12.53%	170
2001	23.06%	18.93%	29	39.24%	24.66%	16.10%	10.83%	5.24%	20.00%	29
2002	17.59%	16.17%	33	34.56%	26.10%	16.98%	6.50%	2.74%	18.14%	33
2003	22.66%	15.76%	22	37.66%	24.48%	12.80%	8.43%	-2.11%	28.45%	22
2004	11.57%	10.56%	50	28.52%	16.75%	9.46%	4.10%	-7.39%	17.58%	49
2005	10.25%	9.89%	74	21.10%	13.21%	8.42%	3.90%	0.26%	10.66%	71
2006	7.47%	7.21%	104	14.85%	11.67%	8.00%	3.79%	-3.02%	9.82%	99
2007	9.69%	9.43%	108	19.36%	15.00%	9.40%	5.00%	-1.34%	9.57%	105
2008	12.70%	10.43%	112	22.23%	16.01%	10.50%	4.78%	-2.09%	10.51%	108
2009	13.77%	13.85%	53	25.73%	20.63%	12.80%	8.77%	4.52%	10.08%	48
2010	11.33%	11.87%	62	21.09%	14.15%	10.50%	6.85%	-1.30%	11.58%	51
2011	15.59%	14.91%	72	33.10%	19.74%	12.46%	9.00%	3.36%	21.21%	63
2012	15.48%	13.65%	113	26.26%	18.85%	12.50%	8.05%	2.61%	16.23%	95
2013	15.02%	11.59%	96	30.30%	18.28%	12.00%	6.86%	-0.19%	14.42%	73
2014	14.86%	13.90%	92	28.85%	20.05%	11.15%	7.16%	-5.08%	19.00%	66
2015	13.43%	10.86%	123	33.97%	15.78%	8.65%	-1.49%	-10.33%	18.12%	70

Source: PitchBook. Data as of September 30, 2017



PRIVATE EQUITY

Multiples by Vintage

POOLED MULTIPLES

EQUAL-WEIGHTED POOLED MULTIPLES

Vintage Year	TVPI	DPI	RVPI	TVPI	DPI	RVPI	Number of Funds
Pre-2001	1.63x	1.61x	0.02x	1.53x	1.51x	0.02x	174
2001	2.12x	2.08x	0.03x	1.97x	1.95x	0.02x	29
2002	1.83x	1.78x	0.05x	1.77x	1.72x	0.05x	33
2003	1.99x	1.91x	0.08x	1.77x	1.67x	0.10x	22
2004	1.67x	1.57x	0.11x	1.57x	1.45x	0.12x	50
2005	1.65x	1.52x	0.12x	1.61x	1.45x	0.16x	74
2006	1.49x	1.25x	0.24x	1.43x	1.17x	0.26x	104
2007	1.55x	1.19x	0.35x	1.52x	1.16x	0.36x	108
2008	1.61x	1.16x	0.45x	1.50x	1.06x	0.44x	112
2009	1.62x	1.16x	0.45x	1.62x	1.14x	0.48x	53
2010	1.43x	0.69x	0.74x	1.47x	0.75x	0.71x	62
2011	1.57x	0.59x	0.98x	1.56x	0.61x	0.95x	72
2012	1.41x	0.48x	0.94x	1.38x	0.45x	0.92x	113
2013	1.31x	0.28x	1.03x	1.26x	0.28x	0.98x	96
2014	1.25x	0.21x	1.03x	1.24x	0.25x	0.99x	92
2015	1.14x	0.11x	1.03x	1.13x	0.13x	0.99x	123

Source: PitchBook. Data as of September 30, 2017

PRIVATE EQUITY

Multiples by Vintage

Vintage Year	TVPI					DPI					Number of Funds
	Top Decile	Top Quartile	Median TVPI	Bottom Quartile	Bottom Decile	Top Decile	Top Quartile	Median DPI	Bottom Quartile	Bottom Decile	
Pre-2001	2.26x	1.93x	1.54x	1.14x	0.69x	2.26x	1.92x	1.52x	1.11x	0.69x	174
2001	2.93x	2.34x	1.88x	1.57x	1.20x	2.84x	2.34x	1.88x	1.57x	1.11x	29
2002	2.62x	2.13x	1.72x	1.35x	1.21x	2.43x	2.08x	1.63x	1.32x	1.20x	33
2003	2.92x	1.93x	1.70x	1.42x	0.86x	2.73x	1.91x	1.63x	1.35x	0.74x	22
2004	2.56x	1.94x	1.56x	1.18x	0.74x	2.56x	1.86x	1.42x	0.96x	0.58x	50
2005	2.35x	1.85x	1.49x	1.21x	0.97x	2.24x	1.73x	1.33x	1.08x	0.64x	74
2006	2.02x	1.72x	1.43x	1.16x	0.78x	1.69x	1.47x	1.27x	0.96x	0.46x	104
2007	2.11x	1.86x	1.51x	1.20x	0.94x	1.85x	1.55x	1.10x	0.82x	0.47x	108
2008	2.01x	1.81x	1.52x	1.18x	0.92x	1.67x	1.36x	1.03x	0.69x	0.45x	112
2009	2.41x	1.90x	1.57x	1.27x	0.97x	2.00x	1.45x	1.08x	0.77x	0.60x	53
2010	1.99x	1.72x	1.39x	1.27x	0.96x	1.35x	0.93x	0.70x	0.49x	0.23x	62
2011	2.14x	1.84x	1.45x	1.21x	1.04x	1.25x	0.93x	0.47x	0.27x	0.12x	72
2012	1.75x	1.55x	1.36x	1.19x	0.94x	0.84x	0.66x	0.39x	0.19x	0.10x	113
2013	1.61x	1.41x	1.26x	1.11x	0.90x	0.64x	0.40x	0.18x	0.04x	0.00x	96
2014	1.56x	1.32x	1.16x	1.05x	0.86x	0.54x	0.35x	0.11x	0.01x	0.00x	92
2015	1.37x	1.20x	1.10x	0.97x	0.87x	0.28x	0.16x	0.04x	0.00x	0.00x	123

Source: PitchBook. Data as of September 30, 2017

PRIVATE EQUITY

PMEs by Vintage

S&P 500 INDEX

RUSSELL 3000 INDEX

Vintage Year	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	Number of Funds
2001	23.06%	6.06%	1.66	23.06%	6.46%	1.62	29
2002	17.59%	7.20%	1.44	17.59%	7.56%	1.42	33
2003	22.66%	9.69%	1.56	22.66%	10.05%	1.54	22
2004	11.57%	8.04%	1.31	11.57%	8.25%	1.30	50
2005	10.25%	8.12%	1.22	10.25%	8.31%	1.21	74
2006	7.47%	7.98%	1.01	7.47%	8.01%	1.00	104
2007	9.69%	7.50%	0.98	9.69%	7.53%	0.97	108
2008	12.70%	8.74%	0.98	12.70%	8.89%	0.98	112
2009	13.77%	16.56%	0.96	13.77%	16.76%	0.96	53
2010	11.33%	13.40%	0.93	11.33%	13.37%	0.94	62
2011	15.59%	12.64%	1.07	15.59%	12.37%	1.08	72
2012	15.48%	13.99%	1.06	15.48%	13.81%	1.07	113
2013	15.02%	13.80%	1.06	15.02%	13.52%	1.06	96
2014	14.86%	10.90%	1.06	14.86%	10.24%	1.06	92
2015	13.43%	9.21%	1.00	13.43%	8.76%	1.00	123

Source: PitchBook. Data as of September 30, 2017

Venture Capital

VENTURE CAPITAL

IRRs by Vintage

POOLED IRRS

IRR HURDLE RATES

Vintage Year	Pooled IRR	Equal-Weighted Pooled IRR	Number of Funds	Top Decile	Top Quartile	Median IRR	Bottom Quartile	Bottom Decile	Standard Deviation	Number of Funds
Pre-2001	1.67%	5.07%	136	18.71%	6.56%	0.00%	-8.60%	-15.53%	31.19%	134
2001	4.24%	2.31%	36	11.70%	5.62%	2.53%	-4.33%	-15.25%	13.73%	36
2002	3.22%	2.83%	17	10.95%	9.12%	3.45%	-6.63%	-10.76%	10.09%	16
2003	5.57%	1.63%	19	11.26%	6.93%	1.29%	-4.57%	-19.48%	13.17%	19
2004	0.24%	-0.11%	22	7.25%	5.80%	1.70%	-10.20%	-13.39%	9.66%	21
2005	10.02%	11.59%	35	16.88%	12.78%	4.74%	-0.08%	-3.68%	13.94%	34
2006	4.70%	2.52%	39	11.90%	9.50%	3.90%	-6.80%	-12.27%	13.17%	37
2007	13.97%	11.85%	46	29.86%	16.30%	7.52%	-1.20%	-10.68%	16.68%	45
2008	10.13%	9.65%	55	26.80%	17.00%	7.70%	0.60%	-14.00%	16.93%	51
2009	11.02%	8.75%	22	19.31%	15.58%	7.10%	3.98%	-3.94%	10.06%	19
2010	17.46%	17.73%	25	46.66%	28.37%	12.03%	4.55%	-0.26%	20.01%	23
2011	15.51%	14.24%	20	27.71%	22.13%	15.95%	5.66%	-2.71%	12.17%	20
2012	18.61%	16.78%	19	28.59%	23.32%	16.75%	10.59%	0.35%	15.32%	16
2013	24.32%	17.82%	21	37.83%	20.23%	16.80%	9.31%	4.85%	17.47%	18
2014	12.56%	13.07%	35	17.71%	14.35%	8.69%	2.34%	-0.33%	79.21%	30
2015	14.88%	12.35%	34	24.34%	11.40%	3.30%	-7.67%	-14.51%	20.24%	26

Source: PitchBook. Data as of September 30, 2017



VENTURE CAPITAL

Multiples by Vintage

POOLED MULTIPLES

EQUAL-WEIGHTED POOLED MULTIPLES

Vintage Year	TVPI	DPI	RVPI	TVPI	DPI	RVPI	Number of Funds
Pre-2001	1.10x	1.01x	0.09x	1.21x	1.15x	0.06x	136
2001	1.30x	1.18x	0.12x	1.16x	1.03x	0.13x	36
2002	1.20x	1.12x	0.07x	1.18x	1.06x	0.12x	17
2003	1.39x	1.14x	0.25x	1.10x	0.90x	0.20x	19
2004	1.02x	0.73x	0.29x	0.99x	0.64x	0.35x	22
2005	1.75x	1.31x	0.44x	1.91x	1.39x	0.51x	35
2006	1.31x	0.77x	0.54x	1.16x	0.67x	0.50x	39
2007	1.93x	1.24x	0.69x	1.80x	1.11x	0.69x	46
2008	1.52x	0.86x	0.66x	1.54x	0.78x	0.77x	55
2009	1.66x	0.65x	1.00x	1.49x	0.60x	0.89x	22
2010	1.85x	0.78x	1.07x	1.93x	0.93x	1.00x	25
2011	1.68x	0.28x	1.40x	1.60x	0.31x	1.29x	20
2012	1.74x	0.28x	1.46x	1.63x	0.22x	1.41x	19
2013	1.58x	0.24x	1.34x	1.42x	0.19x	1.23x	21
2014	1.21x	0.11x	1.10x	1.19x	0.15x	1.04x	35
2015	1.17x	0.04x	1.14x	1.14x	0.04x	1.11x	34

Source: PitchBook. Data as of September 30, 2017



VENTURE CAPITAL

Multiples by Vintage

Vintage Year	TVPI					DPI					Number of Funds
	Top Decile	Top Quartile	Median TVPI	Bottom Quartile	Bottom Decile	Top Decile	Top Quartile	Median DPI	Bottom Quartile	Bottom Decile	
Pre-2001	1.80x	1.37x	1.01x	0.62x	0.27x	1.74x	1.32x	0.90x	0.51x	0.23x	136
2001	1.77x	1.48x	1.22x	0.77x	0.29x	1.76x	1.34x	0.95x	0.62x	0.26x	36
2002	1.80x	1.64x	1.15x	0.69x	0.50x	1.74x	1.61x	1.09x	0.56x	0.33x	17
2003	1.63x	1.39x	1.08x	0.76x	0.40x	1.46x	1.23x	0.92x	0.47x	0.22x	19
2004	1.66x	1.32x	1.11x	0.46x	0.39x	1.37x	1.01x	0.57x	0.19x	0.09x	22
2005	2.45x	1.89x	1.32x	1.00x	0.82x	2.01x	1.65x	0.88x	0.53x	0.41x	35
2006	1.96x	1.60x	1.17x	0.61x	0.46x	1.24x	1.01x	0.51x	0.28x	0.09x	39
2007	2.82x	2.41x	1.50x	0.94x	0.48x	2.10x	1.41x	1.10x	0.28x	0.05x	46
2008	2.63x	1.95x	1.43x	1.02x	0.46x	1.69x	1.15x	0.59x	0.23x	0.09x	55
2009	2.22x	1.77x	1.44x	1.14x	0.87x	1.02x	0.84x	0.48x	0.20x	0.11x	22
2010	3.50x	2.24x	1.59x	1.02x	0.77x	2.11x	0.97x	0.55x	0.29x	0.11x	25
2011	2.25x	1.92x	1.58x	1.22x	0.90x	0.70x	0.54x	0.15x	0.09x	0.05x	20
2012	2.34x	1.84x	1.60x	1.15x	0.94x	0.54x	0.29x	0.11x	0.00x	0.00x	19
2013	1.99x	1.54x	1.39x	1.19x	1.10x	0.45x	0.31x	0.14x	0.00x	0.00x	21
2014	1.36x	1.23x	1.13x	1.02x	0.96x	0.29x	0.13x	0.07x	0.00x	0.00x	35
2015	1.28x	1.21x	1.09x	0.94x	0.87x	0.16x	0.01x	0.00x	0.00x	0.00x	34

Source: PitchBook. Data as of September 30, 2017



VENTURE CAPITAL

PMEs by Vintage

S&P 500 INDEX

RUSSELL 2000 GROWTH INDEX

Vintage Year	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	Number of Funds
2001	4.24%	6.28%	0.89	4.24%	7.16%	0.81	36
2002	3.22%	7.44%	0.86	3.22%	8.41%	0.80	16
2003	5.57%	9.94%	0.94	5.57%	11.69%	0.88	18
2004	0.24%	8.32%	0.64	0.24%	8.67%	0.60	22
2005	10.02%	8.42%	1.13	10.02%	9.08%	1.06	34
2006	4.70%	8.31%	0.76	4.70%	8.27%	0.73	39
2007	13.97%	7.85%	1.10	13.97%	8.48%	1.07	47
2008	10.13%	9.14%	0.89	10.13%	10.18%	0.87	50
2009	11.02%	17.04%	0.87	11.02%	18.06%	0.88	19
2010	17.46%	13.92%	1.13	17.46%	14.04%	1.17	23
2011	15.51%	13.24%	1.08	15.51%	11.58%	1.14	23
2012	18.61%	14.72%	1.19	18.61%	13.25%	1.25	14
2013	24.32%	14.70%	1.27	24.32%	13.33%	1.32	17
2014	12.56%	12.04%	1.01	12.56%	7.75%	1.03	30
2015	14.88%	10.84%	1.01	14.88%	8.00%	1.03	24

Source: PitchBook. Data as of September 30, 2017

Real Assets

REAL ASSETS

IRRs by Vintage

POOLED IRRS

IRR HURDLE RATES

Vintage Year	Pooled IRR	Equal-Weighted Pooled IRR	Number of Funds	Top Decile	Top Quartile	Median IRR	Bottom Quartile	Bottom Decile	Standard Deviation	Number of Funds
Pre-2001	8.80%	11.27%	31	19.87%	16.71%	8.94%	5.09%	2.00%	8.10%	31
2001	35.28%	33.80%	4		36.02%	31.52%	27.23%			4
2002	23.48%	25.45%	5		36.05%	25.00%	16.70%			5
2003	18.87%	19.34%	6		30.08%	22.06%	10.80%			6
2004	8.29%	7.96%	10	24.73%	16.21%	10.93%	1.88%	-2.70%	24.19%	10
2005	2.21%	1.76%	31	11.45%	5.81%	0.94%	-3.36%	-7.94%	13.19%	30
2006	-0.87%	-1.18%	41	8.69%	3.19%	-3.47%	-9.75%	-16.24%	10.69%	38
2007	3.57%	3.32%	66	12.98%	10.20%	4.75%	-1.16%	-11.40%	9.57%	62
2008	4.32%	5.16%	60	16.10%	10.69%	4.75%	0.45%	-5.75%	8.86%	56
2009	9.04%	8.04%	32	20.33%	15.25%	10.09%	2.50%	-12.40%	12.87%	29
2010	11.40%	9.85%	36	17.80%	13.07%	10.24%	6.56%	-4.11%	8.88%	32
2011	13.43%	11.60%	53	22.64%	17.41%	12.87%	5.39%	-3.03%	16.99%	49
2012	12.06%	12.26%	69	24.65%	16.40%	12.39%	9.95%	5.11%	16.57%	62
2013	13.71%	12.13%	71	19.09%	16.87%	11.65%	6.43%	-3.06%	9.77%	59
2014	12.87%	13.73%	78	27.60%	16.66%	12.53%	8.65%	0.35%	19.86%	58
2015	13.64%	14.95%	102	24.82%	19.37%	12.30%	6.01%	-3.15%	13.82%	72

Source: PitchBook. Data as of September 30, 2017

REAL ASSETS

Multiples by Vintage

POOLED MULTIPLES

EQUAL-WEIGHTED POOLED MULTIPLES

Vintage Year	TVPI	DPI	RVPI	TVPI	DPI	RVPI	Number of Funds
Pre-2001	1.85x	1.13x	0.72x	1.67x	1.56x	0.11x	31
2001	2.22x	2.17x	0.05x	2.28x	2.17x	0.11x	4
2002	1.54x	1.53x	0.02x	1.59x	1.57x	0.02x	5
2003	1.65x	1.61x	0.03x	1.81x	1.70x	0.11x	6
2004	1.43x	1.42x	0.01x	1.42x	1.36x	0.05x	10
2005	1.13x	0.94x	0.19x	1.10x	0.92x	0.18x	31
2006	0.95x	0.78x	0.17x	0.93x	0.72x	0.21x	41
2007	1.20x	0.96x	0.24x	1.18x	0.96x	0.22x	66
2008	1.20x	0.86x	0.34x	1.26x	0.91x	0.35x	60
2009	1.37x	0.99x	0.38x	1.35x	0.99x	0.36x	32
2010	1.41x	0.92x	0.49x	1.41x	0.78x	0.63x	36
2011	1.47x	0.72x	0.75x	1.41x	0.79x	0.63x	53
2012	1.35x	0.54x	0.81x	1.36x	0.60x	0.76x	69
2013	1.32x	0.45x	0.87x	1.28x	0.38x	0.90x	71
2014	1.22x	0.24x	0.98x	1.25x	0.27x	0.98x	78
2015	1.16x	0.23x	0.93x	1.19x	0.20x	0.99x	102

Source: PitchBook. Data as of September 30, 2017

REAL ASSETS

Multiples by Vintage

Vintage Year	TVPI					DPI					Number of Funds
	Top Decile	Top Quartile	Median TVPI	Bottom Quartile	Bottom Decile	Top Decile	Top Quartile	Median DPI	Bottom Quartile	Bottom Decile	
Pre-2001	2.47x	2.10x	1.49x	1.29x	1.08x	2.42x	1.93x	1.46x	1.24x	0.92x	31
2001		2.86x	2.42x	1.87x			2.48x	2.17x	1.86x		4
2002		1.81x	1.71x	1.32x			1.81x	1.71x	1.27x		5
2003		1.86x	1.66x	1.37x			1.84x	1.66x	1.36x		6
2004	1.94x	1.82x	1.51x	1.07x	0.82x	1.89x	1.63x	1.50x	1.07x	0.82x	10
2005	1.84x	1.30x	1.00x	0.80x	0.57x	1.65x	1.22x	0.95x	0.52x	0.23x	31
2006	1.50x	1.23x	0.95x	0.60x	0.39x	1.26x	0.95x	0.62x	0.42x	0.17x	41
2007	1.78x	1.45x	1.23x	0.94x	0.53x	1.50x	1.33x	1.00x	0.59x	0.24x	66
2008	1.68x	1.53x	1.24x	1.02x	0.71x	1.50x	1.21x	0.89x	0.50x	0.32x	60
2009	1.94x	1.65x	1.41x	1.18x	0.68x	1.56x	1.34x	1.10x	0.56x	0.25x	32
2010	1.75x	1.62x	1.50x	1.22x	0.97x	1.40x	1.20x	0.76x	0.57x	0.17x	36
2011	1.82x	1.75x	1.45x	1.22x	0.94x	1.61x	1.17x	0.78x	0.42x	0.12x	53
2012	1.70x	1.47x	1.38x	1.26x	1.12x	1.27x	0.76x	0.54x	0.20x	0.07x	69
2013	1.50x	1.39x	1.25x	1.12x	0.97x	0.92x	0.62x	0.24x	0.12x	0.03x	71
2014	1.54x	1.32x	1.20x	1.10x	0.99x	0.55x	0.37x	0.16x	0.05x	0.00x	78
2015	1.38x	1.25x	1.15x	1.08x	0.95x	0.45x	0.26x	0.13x	0.02x	0.00x	102

Source: PitchBook. Data as of September 30, 2017

REAL ASSETS

PMEs by Vintage

S&P 500 INDEX

MORNINGSTAR US REAL ASSETS INDEX

Vintage Year	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	Number of Funds
2001	35.28%	6.28%	1.78	35.28%	7.05%	1.63	4
2002	23.48%	7.44%	1.23	23.48%	7.02%	1.20	5
2003	18.87%	9.94%	1.36	18.87%	6.67%	1.27	6
2004	8.29%	8.32%	1.12	8.29%	5.79%	1.07	10
2005	2.21%	8.42%	0.77	2.21%	5.18%	0.85	31
2006	-0.87%	8.31%	0.65	-0.87%	4.73%	0.72	41
2007	3.57%	7.85%	0.73	3.57%	4.43%	0.94	66
2008	4.32%	9.14%	0.70	4.32%	3.36%	1.01	60
2009	9.04%	17.04%	0.83	9.04%	5.64%	1.24	32
2010	11.40%	13.92%	0.93	11.40%	3.70%	1.31	36
2011	13.43%	13.24%	1.00	13.43%	1.72%	1.43	53
2012	12.06%	14.72%	0.98	12.06%	0.75%	1.32	69
2013	13.71%	14.70%	1.04	13.71%	0.41%	1.30	71
2014	12.87%	12.04%	1.02	12.87%	0.84%	1.21	78
2015	13.64%	10.84%	1.00	13.64%	-0.40%	1.14	102

Source: PitchBook. Data as of September 30, 2017

Debt

DEBT

IRRs by Vintage

POOLED IRRS

IRR HURDLE RATES

Vintage Year	Pooled IRR	Equal-Weighted Pooled IRR	Number of Funds	Top Decile	Top Quartile	Median IRR	Bottom Quartile	Bottom Decile	Standard Deviation	Number of Funds
Pre-2001	13.64%	11.64%	13	26.40%	13.78%	8.78%	5.26%	-0.14%	12.94%	12
2001	26.95%	27.52%	2			27.37%				2
2002	29.39%	34.07%	3			30.17%				3
2003	12.21%	10.64%	4		16.70%	11.09%	7.66%			4
2004	15.23%	14.26%	3			14.03%				3
2005	2.70%	4.64%	8		8.73%	4.90%	2.59%			8
2006	5.65%	3.57%	14	8.91%	6.84%	4.66%	1.86%	-2.16%	8.73%	14
2007	6.14%	6.57%	22	12.39%	9.67%	6.55%	2.71%	-0.80%	8.58%	22
2008	12.82%	13.64%	14	16.54%	14.73%	12.55%	8.85%	7.61%	3.79%	14
2009	7.93%	8.56%	11	15.60%	12.46%	9.10%	7.15%	4.60%	4.34%	11
2010	17.67%	13.25%	18	20.56%	15.69%	10.90%	9.33%	7.21%	9.51%	18
2011	9.74%	10.96%	18	16.91%	12.10%	10.20%	8.61%	4.41%	5.09%	17
2012	10.55%	10.36%	25	15.32%	12.30%	10.52%	5.68%	2.90%	5.53%	22
2013	8.25%	7.94%	29	13.90%	10.02%	9.05%	7.30%	5.74%	4.08%	21
2014	8.62%	7.79%	41	13.60%	11.10%	8.19%	6.79%	-8.10%	12.74%	29
2015	10.05%	8.66%	40	23.00%	13.66%	10.10%	7.83%	4.60%	7.52%	31

Source: PitchBook. Data as of September 30, 2017

DEBT

Multiples by Vintage

POOLED MULTIPLES

EQUAL-WEIGHTED POOLED MULTIPLES

Vintage Year	TVPI	DPI	RVPI	TVPI	DPI	RVPI	Number of Funds
Pre-2001	1.66x	1.61x	0.04x	1.59x	1.51x	0.08x	13
2001	2.08x	2.08x	0.00x	2.28x	2.28x	0.00x	2
2002	2.19x	2.19x	0.00x	2.05x	2.04x	0.01x	3
2003	1.69x	1.66x	0.03x	1.57x	1.55x	0.02x	4
2004	1.86x	1.82x	0.04x	1.80x	1.76x	0.03x	3
2005	1.14x	1.05x	0.09x	1.23x	1.16x	0.07x	8
2006	1.38x	1.19x	0.19x	1.21x	1.09x	0.12x	14
2007	1.30x	1.15x	0.15x	1.34x	1.17x	0.17x	22
2008	1.60x	1.48x	0.11x	1.60x	1.53x	0.07x	14
2009	1.32x	1.12x	0.20x	1.34x	1.09x	0.24x	11
2010	1.58x	1.36x	0.21x	1.46x	1.21x	0.25x	18
2011	1.39x	0.84x	0.56x	1.41x	0.95x	0.46x	18
2012	1.34x	0.67x	0.67x	1.33x	0.72x	0.62x	25
2013	1.18x	0.42x	0.77x	1.20x	0.42x	0.78x	29
2014	1.14x	0.32x	0.82x	1.12x	0.32x	0.80x	41
2015	1.12x	0.23x	0.89x	1.11x	0.25x	0.86x	40

Source: PitchBook. Data as of September 30, 2017

DEBT

Multiples by Vintage

Vintage Year	TVPI					DPI					Number of Funds
	Top Decile	Top Quartile	Median TVPI	Bottom Quartile	Bottom Decile	Top Decile	Top Quartile	Median DPI	Bottom Quartile	Bottom Decile	
Pre-2001	1.97x	1.54x	1.49x	1.41x	0.95x	1.96x	1.54x	1.41x	1.24x	0.95x	13
2001			2.36x					2.36x			2
2002			2.33x					2.32x			3
2003		1.73x	1.54x	1.41x			1.71x	1.54x	1.40x		4
2004			1.65x					1.63x			3
2005		1.36x	1.28x	1.16x			1.35x	1.24x	0.99x		8
2006	1.60x	1.39x	1.23x	1.06x	0.80x	1.41x	1.16x	1.09x	1.04x	0.72x	14
2007	1.75x	1.56x	1.32x	1.15x	0.97x	1.62x	1.37x	1.25x	1.05x	0.73x	22
2008	2.03x	1.67x	1.46x	1.38x	1.22x	1.95x	1.58x	1.37x	1.27x	1.18x	14
2009	1.48x	1.39x	1.32x	1.23x	1.19x	1.37x	1.29x	1.11x	0.97x	0.92x	11
2010	1.77x	1.60x	1.45x	1.22x	1.18x	1.72x	1.45x	1.23x	1.06x	0.63x	18
2011	1.72x	1.49x	1.39x	1.23x	1.15x	1.29x	1.19x	0.99x	0.66x	0.58x	18
2012	1.61x	1.44x	1.33x	1.19x	1.09x	1.14x	1.01x	0.70x	0.51x	0.28x	25
2013	1.37x	1.27x	1.21x	1.13x	0.96x	0.75x	0.63x	0.33x	0.27x	0.03x	29
2014	1.30x	1.17x	1.14x	1.08x	0.75x	0.56x	0.47x	0.18x	0.07x	0.00x	41
2015	1.27x	1.19x	1.14x	1.04x	0.94x	0.50x	0.36x	0.14x	0.04x	0.00x	40

Source: PitchBook. Data as of September 30, 2017



DEBT

PMEs by Vintage

S&P 500 INDEX

BLOOMBERG BARCLAYS US CORPORATE HIGH YIELD INDEX

Vintage Year	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	Number of Funds
2001	26.95%	6.28%	1.56	26.95%	7.98%	1.39	2
2002	29.39%	7.44%	1.63	29.39%	8.58%	1.56	2
2003	12.21%	9.94%	1.27	12.21%	9.07%	1.17	3
2004	15.23%	8.32%	1.56	15.23%	7.85%	1.38	4
2005	2.70%	8.42%	0.94	2.70%	7.73%	0.78	3
2006	5.65%	8.31%	0.88	5.65%	8.04%	0.80	8
2007	6.14%	7.85%	0.96	6.14%	7.68%	0.83	14
2008	12.82%	9.14%	1.05	12.82%	8.83%	0.94	22
2009	7.93%	17.04%	0.81	7.93%	13.13%	0.95	14
2010	17.67%	13.92%	1.05	17.67%	8.35%	1.27	11
2011	9.74%	13.24%	0.91	9.74%	7.19%	1.14	18
2012	10.55%	14.72%	0.93	10.55%	7.41%	1.13	18
2013	8.25%	14.70%	0.94	8.25%	6.02%	1.04	25
2014	8.62%	12.04%	0.95	8.62%	5.62%	1.02	29
2015	10.05%	10.84%	0.98	10.05%	7.13%	1.02	41

Source: PitchBook. Data as of September 30, 2017

Fund-of-Funds



FUND-OF-FUNDS

IRRs by Vintage

POOLED IRRS

IRR HURDLE RATES

Vintage Year	Pooled IRR	Equal-Weighted Pooled IRR	Number of Funds	Top Decile	Top Quartile	Median IRR	Bottom Quartile	Bottom Decile	Standard Deviation	Number of Funds
Pre-2001	5.22%	3.72%	21	11.66%	9.00%	4.00%	0.97%	-4.19%	7.93%	21
2001	15.53%	8.43%	7		12.05%	9.40%	5.57%			7
2002	8.36%	6.68%	4		8.68%	7.59%	5.80%			4
2003	7.75%	6.02%	6		7.65%	6.70%	4.40%			6
2004	6.79%	7.00%	12	10.83%	9.13%	7.77%	6.92%	5.48%	2.52%	12
2005	6.79%	7.02%	18	10.20%	8.64%	7.05%	5.19%	4.21%	3.59%	16
2006	8.32%	7.67%	27	12.25%	10.28%	8.26%	6.73%	3.65%	4.08%	26
2007	9.41%	8.72%	29	14.15%	11.75%	9.42%	6.89%	3.07%	4.23%	27
2008	1.77%	11.63%	35	17.43%	14.60%	11.64%	8.50%	5.25%	4.44%	26
2009	12.25%	12.82%	20	18.00%	14.40%	13.04%	11.11%	10.55%	3.05%	18
2010	11.31%	11.35%	31	14.60%	13.24%	10.82%	8.67%	7.58%	3.37%	27
2011	13.02%	12.71%	37	17.36%	16.29%	12.29%	9.89%	7.44%	6.23%	32
2012	10.62%	11.06%	34	19.22%	13.27%	10.19%	5.60%	1.09%	7.17%	29
2013	9.76%	10.04%	40	16.95%	12.81%	10.20%	7.80%	4.95%	7.29%	33
2014	13.03%	10.64%	33	19.20%	14.35%	10.00%	6.23%	1.59%	6.47%	23
2015	13.60%	12.68%	33	34.13%	22.00%	9.59%	4.85%	-1.13%	18.29%	22

Source: PitchBook. Data as of September 30, 2017



FUND-OF-FUNDS

Multiples by Vintage

POOLED MULTIPLES

EQUAL-WEIGHTED POOLED MULTIPLES

Vintage Year	TVPI	DPI	RVPI	TVPI	DPI	RVPI	Number of Funds
Pre-2001	1.32x	1.27x	0.05x	1.24x	1.20x	0.04x	21
2001	1.70x	1.61x	0.09x	1.50x	1.37x	0.13x	7
2002	1.48x	1.35x	0.14x	1.37x	1.23x	0.13x	4
2003	1.59x	1.32x	0.28x	1.43x	1.19x	0.24x	6
2004	1.48x	1.14x	0.34x	1.51x	1.10x	0.41x	12
2005	1.48x	1.15x	0.33x	1.46x	1.13x	0.34x	18
2006	1.55x	1.02x	0.53x	1.52x	1.00x	0.52x	27
2007	1.56x	0.99x	0.57x	1.53x	0.99x	0.53x	29
2008	1.08x	0.49x	0.59x	1.60x	0.67x	0.93x	35
2009	1.54x	0.64x	0.90x	1.57x	0.70x	0.86x	20
2010	1.50x	0.58x	0.92x	1.48x	0.52x	0.96x	31
2011	1.44x	0.41x	1.03x	1.44x	0.40x	1.05x	37
2012	1.29x	0.21x	1.08x	1.32x	0.20x	1.11x	34
2013	1.19x	0.14x	1.06x	1.20x	0.13x	1.07x	40
2014	1.21x	0.16x	1.05x	1.18x	0.18x	1.00x	33
2015	1.15x	0.07x	1.07x	1.15x	0.08x	1.07x	33

Source: PitchBook. Data as of September 30, 2017

FUND-OF-FUNDS

Multiples by Vintage

Vintage Year	TVPI					DPI					Number of Funds
	Top Decile	Top Quartile	Median TVPI	Bottom Quartile	Bottom Decile	Top Decile	Top Quartile	Median DPI	Bottom Quartile	Bottom Decile	
Pre-2001	1.73x	1.57x	1.24x	1.03x	0.74x	1.70x	1.57x	1.21x	0.92x	0.73x	21
2001		1.73x	1.58x	1.44x			1.62x	1.46x	1.26x		7
2002		1.51x	1.42x	1.30x			1.38x	1.36x	1.23x		4
2003		1.60x	1.53x	1.36x			1.31x	1.27x	1.13x		6
2004	1.65x	1.56x	1.49x	1.43x	1.28x	1.40x	1.24x	1.16x	1.04x	0.83x	12
2005	1.73x	1.57x	1.49x	1.31x	1.15x	1.43x	1.26x	1.09x	1.04x	0.85x	18
2006	1.83x	1.72x	1.56x	1.43x	1.19x	1.18x	1.13x	1.00x	0.95x	0.74x	27
2007	1.88x	1.68x	1.52x	1.36x	1.19x	1.27x	1.12x	1.01x	0.87x	0.76x	29
2008	2.10x	1.79x	1.53x	1.40x	1.18x	0.99x	0.86x	0.62x	0.47x	0.37x	35
2009	1.79x	1.60x	1.55x	1.46x	1.34x	0.94x	0.89x	0.62x	0.57x	0.49x	20
2010	1.75x	1.61x	1.47x	1.33x	1.22x	0.83x	0.71x	0.50x	0.34x	0.19x	31
2011	1.66x	1.58x	1.41x	1.33x	1.15x	0.77x	0.49x	0.33x	0.20x	0.12x	37
2012	1.79x	1.43x	1.27x	1.14x	1.06x	0.36x	0.27x	0.15x	0.06x	0.03x	34
2013	1.39x	1.31x	1.20x	1.14x	1.09x	0.26x	0.15x	0.11x	0.04x	0.00x	40
2014	1.44x	1.27x	1.14x	1.03x	0.99x	0.36x	0.22x	0.05x	0.01x	0.00x	33
2015	1.35x	1.20x	1.09x	1.04x	0.94x	0.22x	0.11x	0.03x	0.00x	0.00x	33

Source: PitchBook. Data as of September 30, 2017



FUND-OF-FUNDS

PMEs by Vintage

S&P 500 INDEX

RUSSELL 3000 INDEX

Vintage Year	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	Number of Funds
2001	15.53%	6.28%	1.22	15.53%	6.67%	1.20	7
2002	8.36%	7.44%	1.07	8.36%	7.79%	1.06	4
2003	7.75%	9.94%	1.04	7.75%	10.29%	1.03	6
2004	6.79%	8.32%	0.99	6.79%	8.51%	0.98	12
2005	6.79%	8.42%	0.94	6.79%	8.59%	0.93	18
2006	8.32%	8.31%	0.90	8.32%	8.31%	0.90	27
2007	9.41%	7.85%	0.90	9.41%	7.87%	0.89	29
2008	1.77%	9.14%	0.59	1.77%	9.26%	0.59	35
2009	12.25%	17.04%	0.93	12.25%	17.22%	0.94	20
2010	11.31%	13.92%	0.93	11.31%	13.87%	0.94	31
2011	13.02%	13.24%	0.98	13.02%	12.95%	0.99	37
2012	10.62%	14.72%	0.95	10.62%	14.50%	0.96	34
2013	9.76%	14.70%	0.96	9.76%	14.38%	0.97	40
2014	13.03%	12.04%	1.03	13.03%	11.33%	1.03	33
2015	13.60%	10.84%	1.01	13.60%	10.31%	1.01	33

Source: PitchBook. Data as of September 30, 2017

Secondaries

SECONDARIES

IRRs by Vintage

POOLED IRRS

IRR HURDLE RATES

Vintage Year	Pooled IRR	Equal-Weighted Pooled IRR	Number of Funds	Top Decile	Top Quartile	Median IRR	Bottom Quartile	Bottom Decile	Standard Deviation	Number of Funds
Pre-2001	12.21%	12.25%	11	22.39%	17.32%	13.16%	6.45%	4.10%	8.18%	11
2001	13.65%	14.59%	2			15.95%				2
2002	15.60%	17.36%	3			18.29%				3
2003	37.59%	37.59%	1			35.07%				1
2004	13.93%	13.84%	5		23.05%	17.00%	10.13%			4
2005	5.84%	4.75%	8		6.64%	6.48%	4.85%			8
2006	6.05%	7.38%	9		5.42%	5.08%	3.96%			6
2007	6.20%	6.57%	9		9.40%	8.10%	4.05%			9
2008	10.76%	10.99%	13	15.02%	13.43%	11.10%	9.31%	5.71%	7.85%	11
2009	11.57%	12.74%	8		15.93%	14.27%	11.15%			8
2010	12.72%	12.80%	7		16.59%	10.80%	9.80%			7
2011	16.03%	14.89%	9		15.30%	13.30%	10.00%			9
2012	14.66%	15.15%	10		24.63%	17.20%	15.41%			8
2013	10.42%	12.39%	12	22.79%	17.28%	15.01%	10.23%	7.18%	17.23%	10
2014	23.47%	17.88%	11		23.28%	21.73%	20.40%			8
2015	27.08%	28.68%	10		49.40%	29.40%	21.20%			9

Source: PitchBook. Data as of September 30, 2017

SECONDARIES

Multiples by Vintage

POOLED MULTIPLES

EQUAL-WEIGHTED POOLED MULTIPLES

Vintage Year	TVPI	DPI	RVPI	TVPI	DPI	RVPI	Number of Funds
Pre-2001	1.48x	1.48x	0.00x	1.43x	1.42x	0.00x	11
2001	1.47x	1.43x	0.04x	1.49x	1.45x	0.04x	2
2002	1.52x	1.49x	0.03x	1.53x	1.50x	0.04x	3
2003	1.83x	1.82x	0.01x	1.83x	1.82x	0.01x	1
2004	1.49x	1.37x	0.12x	1.49x	1.37x	0.12x	5
2005	1.30x	1.14x	0.17x	1.23x	1.06x	0.17x	8
2006	1.34x	1.13x	0.22x	1.45x	1.20x	0.25x	9
2007	1.28x	1.05x	0.23x	1.33x	1.07x	0.26x	9
2008	1.49x	1.15x	0.34x	1.53x	1.13x	0.40x	13
2009	1.52x	1.15x	0.37x	1.56x	1.13x	0.44x	8
2010	1.51x	1.10x	0.41x	1.48x	1.00x	0.49x	7
2011	1.51x	1.03x	0.48x	1.50x	0.69x	0.81x	9
2012	1.36x	0.65x	0.71x	1.37x	0.67x	0.70x	10
2013	1.26x	0.32x	0.94x	1.31x	0.34x	0.97x	12
2014	1.35x	0.40x	0.94x	1.29x	0.22x	1.07x	11
2015	1.27x	0.24x	1.03x	1.32x	0.48x	0.85x	10

Source: PitchBook. Data as of September 30, 2017

SECONDARIES

Multiples by Vintage

Vintage Year	TVPI					DPI					Number of Funds
	Top Decile	Top Quartile	Median TVPI	Bottom Quartile	Bottom Decile	Top Decile	Top Quartile	Median DPI	Bottom Quartile	Bottom Decile	
Pre-2001	1.65x	1.45x	1.30x	1.26x	1.20x	1.64x	1.45x	1.29x	1.26x	1.20x	11
2001			1.52x					1.49x			2
2002			1.53x					1.47x			3
2003			1.83x					1.82x			1
2004		1.60x	1.50x	1.40x			1.45x	1.37x	1.29x		5
2005		1.34x	1.30x	1.25x			1.20x	1.12x	1.07x		8
2006		1.45x	1.30x	1.26x			1.28x	1.11x	1.01x		9
2007		1.46x	1.42x	1.15x			1.20x	1.14x	0.89x		9
2008	1.73x	1.61x	1.45x	1.31x	1.16x	1.51x	1.39x	1.19x	0.91x	0.67x	13
2009		1.61x	1.53x	1.44x			1.33x	1.19x	1.02x		8
2010		1.62x	1.55x	1.40x			1.24x	1.04x	0.82x		7
2011		1.62x	1.46x	1.34x			1.06x	0.68x	0.39x		9
2012	1.49x	1.47x	1.40x	1.27x	1.19x	0.92x	0.78x	0.66x	0.59x	0.48x	10
2013	1.48x	1.31x	1.21x	1.13x	1.06x	0.49x	0.47x	0.35x	0.25x	0.14x	12
2014	1.49x	1.43x	1.39x	1.26x	1.03x	0.51x	0.29x	0.27x	0.07x	0.00x	11
2015	1.39x	1.33x	1.27x	1.23x	1.21x	0.57x	0.35x	0.26x	0.06x	0.00x	10

Source: PitchBook. Data as of September 30, 2017

SECONDARIES

PMEs by Vintage

S&P 500 INDEX

RUSSELL 3000 INDEX

Vintage Year	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	PitchBook Benchmark Return (%)	Index Return (%)	KS-PME	Number of Funds
2001	13.65%	6.28%	1.16	13.65%	6.67%	1.13	2
2002	15.60%	7.44%	1.23	15.60%	7.79%	1.21	3
2003	37.59%	9.94%	1.55	37.59%	10.29%	1.53	1
2004	13.93%	8.32%	1.21	13.93%	8.51%	1.20	5
2005	5.84%	8.42%	0.94	5.84%	8.59%	0.93	8
2006	6.05%	8.31%	0.91	6.05%	8.31%	0.90	9
2007	6.20%	7.85%	0.83	6.20%	7.87%	0.83	9
2008	10.76%	9.14%	0.90	10.76%	9.26%	0.89	13
2009	11.57%	17.04%	0.86	11.57%	17.22%	0.85	8
2010	12.72%	13.92%	0.94	12.72%	13.87%	0.95	7
2011	16.03%	13.24%	1.05	16.03%	12.95%	1.05	9
2012	14.66%	14.72%	1.05	14.66%	14.50%	1.06	10
2013	10.42%	14.70%	0.98	10.42%	14.38%	0.99	12
2014	23.47%	12.04%	1.15	23.47%	11.33%	1.16	11
2015	27.08%	10.84%	1.09	27.08%	10.31%	1.10	10

Source: PitchBook. Data as of September 30, 2017

