

# Is the Risk Worth the Wait?

## Analyzing risk/return profiles of buyout funds

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### Key Takeaways

- The most surprising result of analyzing the risk/return profile of private market funds over a 12-year period between 2000 and 2012 was how poorly the 649 (2000-2012 vintages) venture capital funds in our sample have performed. Exhibiting a median IRR of just 5.1% and a standard deviation of 16.7%, venture capital provided the worst returns on both a real and risk-adjusted basis.
- Buyout funds with less than \$100 million in committed capital have the highest median IRR out of all fund size buckets; however, they also have the highest risk, with a standard deviation for realized returns of 32.3%. We see a corresponding decrease in both returns and risk as fund size increases.
- The median IRRs for 2004-2006 vintage buyout funds dropped to as low as 8% and had the lowest risk-adjusted returns compared to other vintages. This suggests that PE investments suffer from the same cyclicity as the public markets, with one major difference: Public equity investors benefit from run-ups whereas run-ups are a detriment to buyout funds investing in high-priced markets prior to a downturn.
- In the short-to-medium term, we expect aggregate returns for buyout firms to deliver well below limited partner expectations, particularly if there is an economic down-cycle. Yet according to a recent NEPC survey, 56% of endowments and foundations expect PE returns to increase or remain the same, and a full 90% plan to maintain or increase allocations to PE, ignoring the cyclical nature of PE returns.

## Methodology

### *Risk-adjusted returns:*

To analyze risk-adjusted returns, we use the standard Sharpe Ratio while calculating the ratio using two different risk-free metrics for comparative purposes, denoted by <sup>1</sup> and <sup>2</sup>.

Sharpe Ratio=(Median IRR-Riskfree Rate)/(Standard Deviation)

### *Risk-free rate:*

Risk-free rate (average)<sup>1</sup>: This risk free rate is calculated by taking a 5-year rolling average of 3-month Treasury Bill rates in the years immediately following a given vintage year.

- E.g., for a 2000 vintage fund the risk-free rate is an average of 3-month Treasury bills from 2000 to 2005.

Risk-free rate (constant)<sup>2</sup>: This risk-free rate is calculated by taking an average of 3-month Treasury Bill rates from 2000 to 2016 in order to capture a more constant risk-free rate measurement.

## Introduction

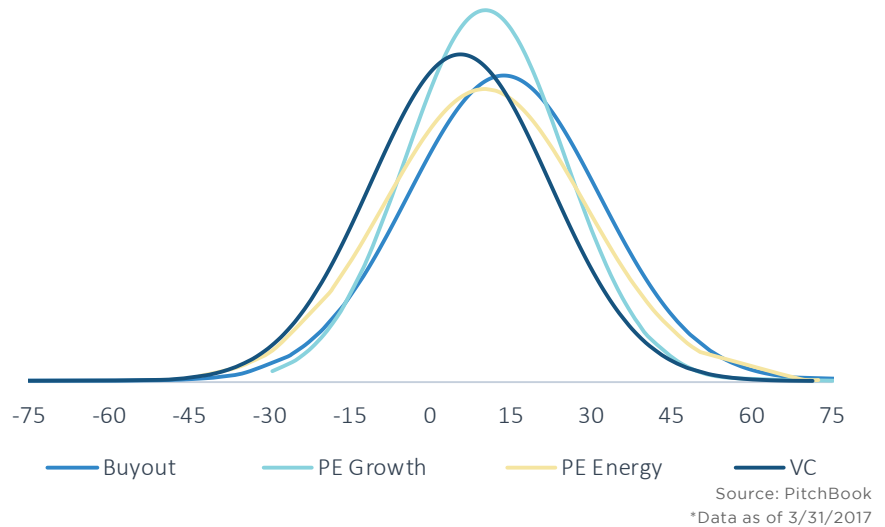
This analyst note utilizes a simple methodology to gauge the risk/return profile of buyout funds by analyzing the dispersion of fund returns over a 12-year period between 2000 and 2012. To do this we take the Sharpe ratio, which is generally used to analyze risk-adjusted returns of an individual fund, and apply that to groups of funds across different strategies, sizes and vintages. The analysis begins with a comparison of risk/return profiles between buyout funds and other private market strategies, then focuses solely on buyout funds across different vintages and sizes. For further details, please refer to the methodology in the sidebar.

## Buyout, Distressed Debt Funds Reign Supreme

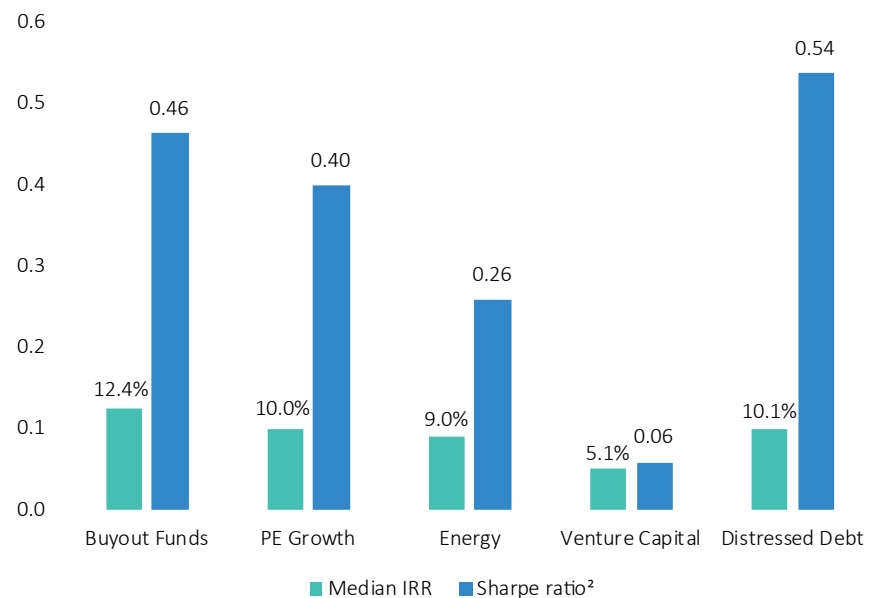
The median IRR for buyout funds with vintages between 2000-2012 is 12.4%, with a standard deviation of 17.9%. In the realm of private markets, this outperformed growth funds, energy funds and venture capital funds on a real and risk-adjusted basis<sup>1</sup> over the same period. While buyout funds were the best performing on a real return basis, distressed debt funds had the highest risk-adjusted<sup>1</sup> returns, with a median IRR of 10.1% and a standard deviation of 11.0%. Intuitively, we would expect variation in returns for distressed funds to be much higher given that this is considered a high-risk strategy. However, managers have exhibited skill in selecting turnaround investments, and distressed debt packages are often structured to minimize downside risk while maximizing upside optionality. Many distressed debt managers do this by entering at significant discounts and through creative adjustments to the investment's capital structure. Additionally, consistent cash flow through debt instruments contribute to a more consistent return profile given the yield component of such investments.

<sup>1</sup>: Please see methodology, sidebar, for details on risk-adjusted measurements.

Distribution of fund IRRs by fund type, vintages 2000-2012



Median IRR by fund type, vintages 2000-2012



Most notable when analyzing across private market strategies is how poorly the 649 venture capital funds in our sample have performed. With a median IRR of just 5.1% and a standard deviation of 16.7%, venture capital provided the worst returns on both a real and risk-adjusted basis. Venture capital returns are asymmetric as the model is designed with the understanding that most early-stage investments will fail or deliver inadequate results, but with the expectation that the remaining few investments will deliver exceptional returns that drive returns for the entire fund upward.

As such, LPs in venture funds are likely willing to deal with lower median returns and higher volatility, but the question then becomes how often are VC funds metaphorically knocking it out of the park? The answer is rarely. VC funds included in this analysis had a lower top-decile threshold (25% IRR) than all other private market strategies except distressed debt, signifying that US and EU VC firms mostly miss the mark when identifying high-flying opportunities. Manager selection for this asset class is even more crucial when considering the low probability of a venture firm outperforming its private market peers.

	BUYOUT	PE GROWTH	ENERGY	VENTURE CAPITAL	DISTRESSED DEBT
Mean	13.6	10.3	10.3	5.5	11.7
Standard Deviation	17.9	14.8	18.7	16.7	11.0
Median	12.4	10.0	9.0	5.1	10.1
Sharpe ratio <sup>1</sup>	0.6	0.5	0.4	0.2	0.7
RF Rate (constant)	2.1	2.1	2.1	2.1	2.1

Source: PitchBook

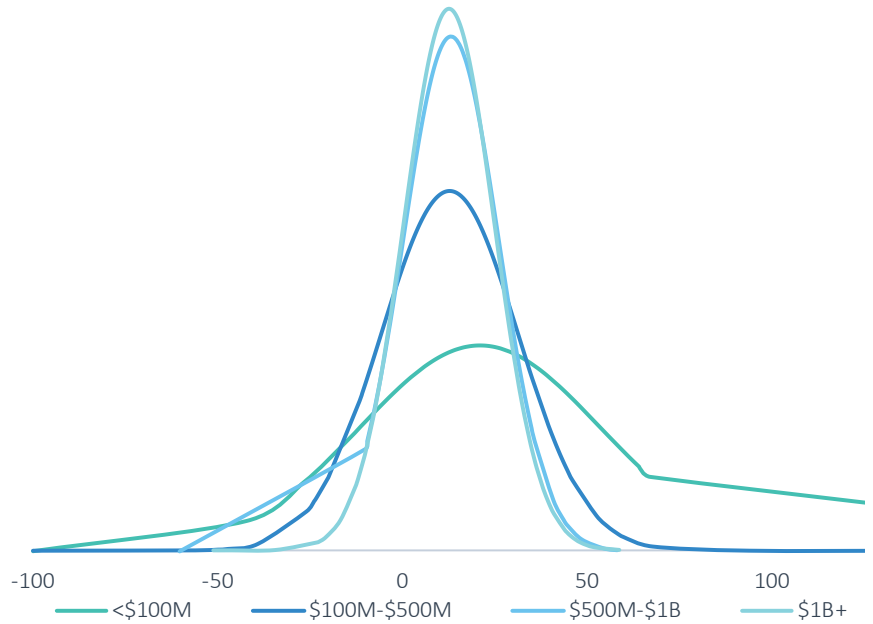
\*Data as of 3/31/2017. Fund vintages from 2000 to 2012

## Size Matters

Buyout funds with less than \$100 million in committed capital have the highest median IRR out of all fund sizes, but also the highest risk with a standard deviation of 32.3%. This is somewhat unsurprising given that such small funds generally invest on the lowest price spectrum of sponsor-grade businesses, which often have a wide range of idiosyncratic risks, such as geographic and customer concentration. With increased risk comes increased return potential; the payoff has been significant for PE managers who have successfully expanded small and medium enterprises across regions, product lines or target demographics.

As investors move up through the different size buckets, we find that returns and risk decrease as fund size increases. Those with more than \$1 billion in committed capital had a median IRR of 12.6% and the smallest dispersion of returns (12.3%). We attribute this to the nature of large-cap portfolio companies, which generally have a national presence with well-diversified customer segments, geographic focus and product lines. Conversely, companies that fall within the scope of sub-\$100 million funds have none of those businesses' diversification benefits, but investors are provided higher potential returns to compensate for the additional operational risk.

Buyout fund return distribution by size, vintages 2000-2012



Source: PitchBook  
\*Data as of 3/31/2017

## No Escaping the Cyclical Nature of Markets

The risk/return profile of buyout strategies varies greatly between different vintages, which is why diversification across both vintages and fund strategies is important when investing in private markets. Risk-adjusted returns were worst for funds that began investing in the years leading up to the financial crisis (2004-2006 vintages), with the Sharpe ratio<sup>1,2</sup> dropping as low as 0.4 depending on the risk-free rate used for analysis.

*It is interesting to note that the Sharpe ratios are very similar until 2008 when monetary policy drove the risk-free rate towards zero.*

The table below demonstrates the degree to which PE investments suffer from the same cyclical nature as public markets, as the hardest-hit buyout funds were those investing in the years leading up to the crisis. Many funds acquired companies at higher-than-historical multiples and then faced several scenarios which all drove IRRs downward. During the last financial crisis, many sponsored companies underperformed expectations, making an exit during a time when liquidity dried up even more unlikely, which extended hold periods and consequently drove down IRRs. Other sponsors were even forced to sell off during the recession, taking subdued valuations due to the predefined lock-up period in some LP agreements. This is one reason for a growing trend toward longer-term commitments and stapled secondaries, which provide managers with additional time to maximize the value of their investments.

### US & EU buyout funds

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mean	15.1	17.8	15.0	27.5	12.8	6.9	7.9	10.5	14.4	14.9	12.7	17.0	17.0
Median	13.6	16.5	16.9	20.7	11.7	8.2	8.4	11.1	14.4	13.9	12.8	13.2	14.0
Standard Deviation	13.3	18.7	20.7	35.4	18.9	13.3	15.5	15.7	12.0	12.3	14.0	22.3	14.0
Sharpe Ratio <sup>1</sup>	0.8	0.8	0.7	0.5	0.5	0.4	0.4	0.6	1.2	1.1	0.9	0.6	1.0
Sharpe Ratio <sup>2</sup>	0.9	0.8	0.7	0.5	0.5	0.5	0.4	0.6	1.0	1.0	0.8	0.5	0.9
Risk-free rate (average)	2.7	2.2	2.4	3.0	3.1	2.8	2.2	1.2	0.4	0.1	0.1	0.1	0.1
Risk-free rate (constant)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Count	84	84	45	45	54	113	107	88	84	51	48	62	82

Source: PitchBook  
\*Data as of 3/31/2017

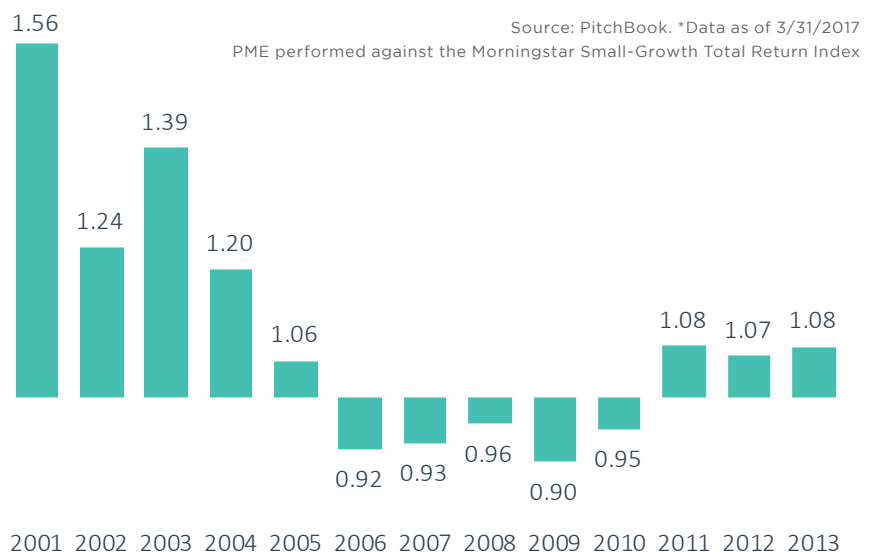
### What Lies Ahead

There were only 629 active PE firms sponsoring 1,556 companies in 2000, whereas today those numbers have increased to 1,817 PE (189% growth) firms sponsoring 7,218 portfolio companies (364% growth). The number of sponsored companies grew at twice the rate of PE sponsors—and these figures don’t even account for the percentage increase in direct deals completed by LPs such as sovereign wealth funds and family offices. This greater competition for a finite number of quality target companies—which has driven acquisition multiples to record highs—along with persistently low economic growth will likely place downward pressure on returns.

A recent survey by NEPC<sup>2</sup> shows that 90% of endowments and foundations expect to increase or maintain their allocations to PE, with only 44% expecting PE to deliver lower returns. Unfortunately, we expect the cyclical nature of PE returns to drive aggregate returns for buyout firms well below LP expectations, as a KS-PME analysis comparing buyout returns to the Morningstar Small Growth Total Return Index shows underperformance by buyout funds in the years leading up to and through the last financial crisis. Given that the current PE environment closely mirrors the run-up to 2008 (record multiples, record dry-powder, and decreasing net cash flows to LPs), LPs are likely better off taking a much more cautious approach to allocating excess capital to buyout funds.

2: <http://www.nepc.com/insights/2017-q3-endowment-foundation-survey-results-infographic>

#### Buyout KS-PME by vintage



Furthermore, an analysis by BCG<sup>3</sup> shows that deleveraging and financial engineering were enough to deliver exceptional returns in the 1980s and 90s, but these value drivers have played a much smaller role in boosting returns as the industry evolved. As of 2012, the two most important components driving value creation were operational improvement and multiple expansion, together accounting for more than 90% of PE value creation. The most recent vintage funds are in an even worse position than pre-crisis vintages, as purchase-price multiples have been at near-record highs for the last four years and the exit market has been declining since 2015, amid relatively good global economic growth.

As capabilities of the general partner become ever more important in driving returns, there has been a growing gap between top- and bottom-quartile managers, as the spread in returns has reached 14.3% compared to a 10-year average of 11.24%. That marks a four-year trend toward a widening spread between 2009 to 2013 and we think it is likely that spread will accelerate for vintages beyond 2013 given current market dynamics.

Top-quartile PE firms that have clear competitive advantages, such as niche specialization, unique sourcing capabilities and/or a differentiated operational strategy, are likely to continue to deliver strong returns to their LPs. However, many PE firms may struggle to outperform the record bull market in public equities and it is unclear what type of effect this will have on asset allocation decisions as current sentiment centers on a 20-plus year history of consistently outperforming public equities.

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<sup>3</sup>: [https://www.bcgperspectives.com/Images/Power-of-Buy-and-Build\\_ex02\\_large\\_tcm80-205190.png](https://www.bcgperspectives.com/Images/Power-of-Buy-and-Build_ex02_large_tcm80-205190.png)