Private Equity (PE) Performance in The United States

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We use the Thomson Reuters Venture Capital and Thomson Reuters Buyout indices as proxies for U.S. Private Equity (PE) performance and compare them to U.S. stocks and bonds. Both PE indices have outperformed stocks and bonds and they have higher average and median monthly returns. However, PE indices also had higher risk compared to stocks and bonds. On a risk-adjusted basis, PE has outperformed stocks but underperformed bonds. PE has also created more wealth compared to stocks and bonds. Both the PE indices also have significantly positive four-factor alpha. Our results indicate that PE has created tremendous value.

INTRODUCTION

Private Equity (PE) firms raise funds from institutions and wealthy individuals and then invest that money in buying and selling businesses. They usually buy the whole company. PE firms have long holding periods to turn around the private firm and make it profitable. After raising a specified amount, a fund will close to new investors; each fund is liquidated, selling all its businesses, within a preset time frame, usually no more than ten years. This involves both increasing the company's growth and cutting costs. The PE firm then comes up with an IPO for the private firm. PE investors make money when a target company is sold at a much higher multiple. On the other hand, if the target company fails, the PE firm and its investors will both lose money. PE firms often use some of their own money and some borrowed money to make the purchase. PE firms use a lot of borrowed money or leverage along with their own funds. The leverage can be as high as 60%–70% in some cases.

After raising a specified amount, a fund will close to new investors; each fund is liquidated, selling all its businesses, within a preset time frame, usually no more than ten years. A firm's track record on previous funds drives its ability to raise money for the future fund. Private equity firms accept some constraints on their use of investors' money. A fund management contract may limit, for example, the size of any single business investment. Once the money is committed, however, investors—in contrast to shareholders in a public company—have almost no control over management. Although most firms have an investor advisory council, it has far fewer powers than a public company's board of directors (Barber and Goold, 2007).

With large buyouts, private equity funds typically charge investors a fee of about 1.5% to 2% of assets under management, plus, subject to achieving a minimum rate of return for investors, 20% of all fund profits. Fund profits are mostly realized via capital gains on the sale of portfolio businesses (Barber

and Goold, 2007). This is much like the compensation structure of Hedge Fund (HF) managers [Brav, et al. (2010)].

PE firms also have different metrics on how to measure the performance of their holding companies. Public firms are fixated with Earnings Per Share (EPS). According to Posen (2007), public firms makes countless decisions based on how these will affect EPS such as avoiding any decision that will lead to higher leverage or decline in debt ratios, holding excess cash, choosing to repurchase shares, hanging on to the portfolio even when it is failing to earn it's WACC, making acquisitions that will never justify their cost of capital, etc. PE firms on the other hand neither reward general partners or nor their managers on the basis of EPS. This helps them avoid traps faced by many public companies.

Kiechel III (2007) says that PE firms have a long-term focus for their target firms along with the following characteristics:

I. They use debt aggressively
II. They focus on cash flow, not on earnings (EPS) reported for accounting purposes
III. They reduce costs relentlessly
IV. They identify a strategy that favors the line of business in which the acquisition dominates its competitors, and then they often sell off its other businesses
V. They think imaginatively about who would constitute the best owner for the business and ask how long an owner should hold on to the property

If the stock market truly values a company's future prospects, then, at least for some enterprises, a short, perhaps even painful, strategy workout at the hands of a private equity firm is likely to boost shareholder value over the long term

DATA

We look at the performance of PE in the U.S. from January 1997–August 2018 and compare them to domestic stock and bond markets.

We use Thomson Reuters US Buyout and Thomson Reuters US Venture Capital (VC) indices as proxies for U.S. PE performance. Appendix 1 shows the construction methodology for Thomson Reuters PE indices. Russell 3000 and Bloomberg Barclays Aggregate Bond Market Indices are used as proxies for the U.S. stock and bond market respectively. All the indices were downloaded from Bloomberg Terminal. As a robustness test, we also form a portfolio of 65% stocks and 35% bonds. Following Stout and Mitchell (2006) and Brown, et al. (2003), a portfolio of 65% in a broad index of domestic equities (Russell 3000) and 35% domestic bonds (Barclays US Agg Bond Index) is formed. This is also the allocation for Representative Jim DeMint's Social Security Savings Act of 2003.

All these indices returns are in U.S. currency for an equal or apples-to-apples comparison. Reuters Venture Capital (VC) index was formed in January 1996 whereas the Reuters Buyout Index was created in January 1997. Therefore, for an equal comparison the analysis was done from January 1997–August 2018.

Correlation

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TABLE 1
SPEARMAN RANK CORRELATION BETWEEN PE, STOCKS, BONDS AND A PORTFOLIO
OF 65% STOCK/35% BOND DURING THE PERIOD OF OUR STUDY

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Jan 1997– Aug 2018	Thomson Reuters US VC TR US$	Thomson Reuters US Buyout TR US$	Stocks— Russell 3000 TR US$— Stocks	Bonds— Barclays US Agg Bond TR US$	65% Stock/35% Bond
Thomson Reuters US VC TR US$	1				
Thomson Reuters US Buyout TR US$	0.6388***	1			
Stocks—Russell 3000 TR US$ Stocks	0.7642***	0.8365***	1		
Bonds—Barclays US Agg Bond TR US$	-0.1409**	-0.0485	-0.0769	1	
65% Stock/35% Bond	0.7505***	0.8252***	0.9896***	0.0365	1

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Table 1 shows the Spearman Rank Correlation test for correlation between PE, stocks, and bonds in the United States. Results indicate that PE has high correlation with stocks while having a low correlation with bonds.

Descriptive Statistics

TABLE 2
SHOWS DESCRIPTIVE STATISTICS FOR PE, STOCKS, BONDS AND THE 65% STOCK/35% BOND PORTFOLIO IN THE UNITED STATES DURING THE PERIOD OF OUR STUDY

Jan 1997–Aug 2018	Average Monthly Returns	Median Monthly Returns	Standard Deviation of Monthly Returns	Range	Minimum	Maximum	P-Value of Average Monthly Returns
Thomson Reuters US Buyout TR US$	1.51%	1.19%	6.26%	49.10%	-17.24%	31.86%	<0.01
Thomson Reuters US VC TR US$	1.95%	2.09%	8.68%	54.69%	-24.31%	30.38%	<0.05
Stocks—Russell 3000 TR US$	0.64%	1.08%	4.36%	29.24%	-17.87%	11.37%	<0.01
Bonds—Barclays US Agg Bond TR US$	0.41%	0.47%	0.97%	7.09%	-3.36%	3.73%	<0.01
65% Stock/35% Bond	0.56%	0.77%	2.84%	19.87%	-12.44%	7.43%	<0.01

We measure the average monthly risk and returns for the PE indices, stocks, bonds and the 65/35 portfolio from January 1997–August 2018 as shown in table 2. PE (both buyout & VC) has massively outperformed stocks and bonds in the United States. However, PE indices also had higher risk (standard deviation of returns) compared to stocks and bonds.

RISK-ADJUSTED PERFORMANCE

A portfolio may have higher returns, but it could have achieved the returns by taking more risk. Therefore, we compute risk-adjusted performance to compare the different portfolios. We calculate Sharpe Ratio (1966), Sortino Ratio (1991) and Omega Ratio (2002) for each portfolio from January 1997–August 2018 to compare their risk-adjusted performance. These measures have been used previously by several studies such as Kaserer & Diller (2004), Kanuri, et al. (2017), Johnson & Kanuri (2018), Kanuri & Malhotra (2020) etc. to compare risk-adjusted performance of different portfolios.

Sharpe Ratio—The Sharpe Ratio (1966) evaluates how well an ETF compensates its investor for each unit of risk they incur. The higher the Sharpe ratio, the better is the performance of the ETF.

$$Sharpe\ Ratio = \frac{(R_p - R_f)}{\sigma_p} \tag{1}$$

where R_P denotes the monthly returns on the portfolio.

R_f is the monthly risk-free rate.

σ_p is the standard deviation of the portfolio's excess returns.

Sortino Ratio—The Sortino ratio (1991) differentiates between good and bad volatility in the Sharpe ratio. The differentiation of upward and downward volatility allows the calculation of the risk-adjusted return to provide a performance measure of an investment without penalizing it for positive returns. Similar to the Sharpe ratio, the higher the Sortino ratio, the better is the performance of a portfolio. The Sortino Ratio is shown as follows:

$$Sortino\ Ratio = \frac{(R_p - R_f)}{\sigma_d} \tag{2}$$

where R_P and R_f are described as above and σ_d is the standard deviation of the portfolio's negative returns.

Omega Ratio—Introduced by Shadwick and Keating (2002), it is a way of measuring the performance of financial assets based on the level of returns they offer in return for the risk of investing in them. It is a ratio of weighted gains to weighted losses. The measure divides expected returns into two parts – gains and losses, or returns above the expected rate (the upside) and those below it (the downside). Therefore, in simple terms, consider omega as the ratio of upside returns (good) relative to downside returns (bad). While the Sharpe Ratio covers only the first two moments of return distribution (means and variance), Omega Ratio covers all moments of return distribution or the Omega ratio is an alternative measure of asset performance that gives the investor the information the Sharpe ratio discards.

$$\Omega = \frac{\int_r^b (1 - F(x))dx}{\int_a^r F(x)dx} \tag{3}$$

where F(x) is the cumulative probability distribution (i.e. the probability that a return will be less than x), r is a threshold value selected by the investor and a,b are the investment intervals. It is effectively equal to the probability weighted gains divided by the probability weighted losses after a threshold.

Results

TABLE 3
SHOWS RISK-ADJUSTED PERFORMANCE (SHARPE RATIO, SORTINO RATION & OMEGA RATIO) FOR PE, STOCKS, BONDS AND 65% STOCK/35% BOND PORTFOLIO IN THE U.S. DURING THE PERIOD OF OUR STUDY

Jan 1997–Aug 2018	Sharpe Ratio	Sortino Ratio	Omega Ratio
Thomson Reuters US Buyout TR US$	0.214	0.371	1.837
Thomson Reuters US VC TR US$	0.205	0.430	1.717
Stocks—Russell 3000 TR US$	0.108	0.151	1.324
Bonds—Barclays US Agg Bond TR US$	0.251	0.415	1.910
65% Stock/35% Bond	0.138	0.197	1.429

Results from table 3 indicate that both the PE indices have outperformed stocks but underperformed bonds. Bonds had superior risk-adjusted performance (Sharpe, Sortino and Omega Ratios) compared to both PE indices and stocks. Both the PE indices also have a higher Sortino Ratio compared to U.S. stocks

but lower than U.S. bonds. This indicates that PE indices have provided better downside protection compared to stocks but lower than bonds.

CUMULATIVE RETURNS AND WEALTH

Following Kanuri (2016), we also construct a Cumulative Wealth Index (CWI) for each category. The CWI measures the outcome of investing $1,000 in each category at the beginning of January 1997, presuming reinvestment of dividends

Results

TABLE 4
SHOWS CUMULATIVE WEALTH INDEX (CWI) FOR PE, STOCKS, BONDS AND 65% STOCK/35% BOND PORTFOLIO IN THE U.S. DURING THE PERIOD OF OUR STUDY

Jan 1997–Aug 2018	Cumulative Returns (1997–2016)	Cumulative Wealth Aug 2018 (Initial Wealth $1000 in Jan 1997)
Thomson Reuters US Buyout TR US$	2923.05%	$30,230.50
Thomson Reuters US VC TR US$	5765.46%	$58,654.61
Stocks—Russell 3000 TR US$	311.60%	$4,116.04
Bonds—Barclays US Agg Bond TR US$	187.33%	$2,873.27
65% Stock/35% Bond	286.11%	$3,861.12

Both PE indices have outperformed U.S. stocks and bonds and have much higher cumulative returns and created much more wealth as shown in table 4. This outperformance is staggering. Thomson Reuters US Buyout and Thomson Reuters VC index have cumulative returns of 2923.05% and 5765.46% respectively. Stocks (Russell 3000) and bonds (Bloomberg Barclays U.S. Agg Bond Index) have cumulative returns of 311.60% and 187.33% respectively over this time period. PE indices have also outperformed the 65% stock/35% bond portfolio in the U.S.

ALPHA

Carhart Four-Factor Model (1997)

According to Elton, Gruber, and Blake (2011), the most frequently used multi-factor model for measuring portfolio performance is the three-factor model developed by Fama and French (1993). The Carhart four-factor (1997) model is similar to the Fama-French three-factor model (1993), but it includes an additional factor for momentum (MOM), which is the return difference between a portfolio of past 12-month winners and a portfolio of past 12-month losers. The four-factor model is consistent with a model of market equilibrium with four risk factors. All these factors were taken from Dr. Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Research).

For each portfolio, monthly returns are used to estimate the following regression:

$$R_{PE,t} - RF_t = \alpha_i + \beta_i \, (RM_t - RF_t) + \beta_s \, SMB_t + \beta_v \, HML_t + \beta_m \, MOM + \varepsilon_{i,t} \qquad (4)$$

In equation (4) above, $R_{PE,t}$ is monthly returns for month t of the PE, RF_t is the US T-bill rate of return for month t, RM_t is the return on CRSP value-weighted index for month t, SMB_t is the realization on capitalization factor (i.e. small-cap return minus large-cap return) for month t, HML_t is the realization on value factor (value return minus growth return) for month t, MOM is the return difference between past 12-month winners and 12-month losers, ε_{it} is the error term. Here, a positive alpha would indicate superior performance, whereas a negative alpha would indicate underperformance, compared to the four-factor model.

Results

TABLE 5
SHOWS THE CARHART FOUR-FACTOR ALPHA FOR BOTH THE PE INDICES.
STANDARD ERRORS ARE HETROSKEDASTICITY-CONSISTENT

Jan 1997–Aug 2018	Monthly Alpha	K	SMB	HML	MOM	R^2
Thomson Reuters US Buyout TR US$	0.66%**	1.126946***	-0.3165133**	-0.0272812	0.0717938	0.5792
Thomson Reuters US VC TR US$	1.07%***	1.399434***	-0.3275517**	-0.9431213***	0.0347778	0.6442

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Results from Table 5 indicate that both the PE indices have significantly positive four-factor alpha. Results were statistically significant at least at the 5% level in both the cases.

2007 FINANCIAL CRISIS

As a robustness test, we also test the performance of all portfolios during the recent financial crisis. According to the Wall Street Journal, the most recent bear market in US stocks was declared in June 2008 after the DJIA had fallen 20% from its October 11, 2007 high. The bear market reversed course during March 2009. Our analysis covers of this financial crisis period from October 2007 to March 2009.

TABLES 6 A AND B
SHOW ABSOLUTE AND RISK-ADJUSTED OF DIFFERENT PORTFOLIOS DURING THE RECENT FINANCIAL CRISIS (OCTOBER 2007–MARCH 2009)

October 2007–March 2009	Average Monthly Returns	Median Monthly Returns	Standard Deviation of Monthly Returns	Range	Minimum	Maximum	Cumulative
Thomson Reuters US Buyout TR US$	-2.25%	-1.11%	7.87%	-17.24%	12.25%	29.49%	-37.22%
Thomson Reuters US VC TR US$	-2.03%	-0.36%	7.19%	-14.94%	10.02%	24.96%	-34.00%
Stocks— Russell 3000 TR US$	-3.33%	-2.12%	6.50%	-17.87%	8.53%	26.41%	-47.76%
Bonds— Barclays US Agg Bond TR US$	0.47%	0.21%	1.52%	-2.36%	3.73%	6.09%	8.52%
65% Stock/35% Bond	-2.00%	-1.37%	4.47%	-12.44%	6.03%	18.48%	-31.76%

October 2007–March 2009	Sharpe Ratio	Sortino Ratio	Omega Ratio
Thomson Reuters US Buyout TR US$	-0.30	-0.33	0.43
Thomson Reuters US VC TR US$	-0.30	-0.33	0.46
Stocks—Russell 3000 TR US$	-0.54	-0.51	0.23
Bonds—Barclays US Agg Bond TR US$	0.21	0.43	1.84
65% Stock/35% Bond	-0.48	-0.48	0.27

PE outperformed stocks but underperformed bonds during the recent financial crisis as shown in tables 6a and 6b.

CONCLUSION

This paper looks at the performance of Private Equity (PE) indices in U.S. U.S. Public firms are fixated with Earnings Per Share (EPS). PE firms have different metrics on how to measure the performance of their holding companies. PE firms neither reward general partners or nor their managers on the basis of EPS. This helps them avoid traps faced by many public companies. PE firms also use a lot of borrowed money or leverage along with their own funds. The leverage can be as high as 60%–70% in some cases.

We use Thomson Reuters US Buyout and Thomson Reuters US VC for proxies as for U.S. PE performance. We also compare them to U.S. stocks (Russell 3000), U.S. bonds (Barclays US Agg Bond Index) and a portfolio of 65% stocks/35% bonds. The period of this analysis was January 1997–August 2018. Results indicate that PE has a high correlation with stocks while having a low correlation with bonds. PE indices have outperformed stocks and bonds and have higher average and median monthly returns. However, PE indices also had a higher risk (standard deviation of returns) compared to both stocks and bonds. On a risk-adjusted basis (Sharpe, Sortino & Omega Ratios), PE has outperformed stocks but underperformed bonds. Both the PE indices also have a higher Sortino Ratio compared to U.S. stocks but lower than U.S. bonds. This indicates that PE indices have provided downside protection compared to stocks but lower than bonds. PE also much higher cumulative returns and created much more wealth compared to both stocks and bonds. Both the PE indices have significantly positive Carhart four-factor alpha. Results were statistically significant at 5% or better in both cases. Overall, our results indicate that PE has created tremendous value for their investors.

REFERENCES

Barber, F., & Goold, M. (2007). The strategic secret of private equity. *Harvard Business Review*, 85(9), 53.

Brav, A., Jiang, W., & Kim, H. (2010). Hedge fund activism: A review. *Foundations and Trends® in Finance*, 4(3), 185-246.

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, 52(1), 57-82.

Davidoff, T., Brown, J. R., & Diamond, P. A. (2003). *Annuities and individual welfare (No. w9714)*. National Bureau of Economic Research.

Elton, E. J., Gruber, M. J., & Blake, C. R. (2011). Holdings data, security returns, and the selection of superior mutual funds. *Journal of Financial and Quantitative Analysis*, 46(02), 341-367.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56.

Johnson, W. F., & Kanuri, S. (2018). Is Target-Date Mutual Fund Underperformance Rational? *The Journal of Investing*, 27(1), 87-97.

Kanuri, S. (2016). Hedged ETFs: Do they add value? *Financial Services Review*, 25(2), 181-198.

Kanuri, S., & Malhotra, D. (2020). Do Health Care Mutual Funds Provide Healthy Risk-Adjusted Returns? *The Journal of Wealth Management*, 22(4), 90-103.

Kaserer, C., & Diller, C. (2004). European private equity funds-a cash flow based performance analysis.

Keating, C., & Shadwick, W. F. (2002). A universal performance measure. *Journal of Performance Measurement*, 6(3), 59-84.

Kiechel, W., III. (2007). Strategy-Private equity's long view. *Harvard Business Review*, 85(7/8), 18-19.

Pozen, R. C. (2007). If private equity sized up your business. *Harvard Business Review*, 85(11), 78-87.

Sharpe, W. F. (1966). Mutual fund performance. *The Journal of Business*, 39(1), 119-138.

Sortino, F., & Van Der Meer, R. (1991). Downside risk. *The Journal of Portfolio Management*, 17(4), 27-31

Stout, R., & Mitchell, J. B. (2006). Dynamic Retirement Withdrawal Planning. *Financial Services Review*, 15(2), 117.

APPENDIX

U.S. PE Indices

    Source—https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/tr-com-financial/methodology/private-equity-buyout-index-methodology.pdf

    https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/private-equity-buyout-index.pdf

    https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/tr-com-financial/fact-sheet/venture-capital-indices-overview-factsheet-10-2014.pdf

    The **Thomson Reuters Private Equity Buyout Index** ("Thomson Reuters PE Buyout Index") replicates the performance of the Thomson Reuters Private Equity Buyout Research Index ("Thomson Reuters PE Buyout Research Index") through a combination of liquid, publicly listed assets. The Index is calculated from the performance of seven private equity sector portfolios (Technology, Industrials, Healthcare, Financials, Consumer Non-Cyclical, Consumer Cyclical, and Utilities and Energy). The Thomson Reuters PE Buyout Index is the first index to allow liquid access to the gross performance of the private equity industry through index-linked investment products. The Thomson Reuters PE Buyout Index is published daily.

    The **Thomson Reuters Venture Capital Research Index** (TR VC Research Index) measures the aggregate gross returns of the US venture capital industry by tracking the performance of individual US venture capital-backed private companies, which are not available for public investment, using Thomson Reuters Private Company Data and is published quarterly. Tracks the performance of the US venture capital industry through a comprehensive aggregation of venture-funded private company values.

TR VC RESEARCH INDEX METHODOLOGY

    The TR Venture of venture capital funded firms. The Index:
    I.   Leverages Thomson Reuters Private Company Data, of over 22,000 U.S. firms
    II.   Estimates the value of each company over time by compiling known firm values, estimating missing values and interpolating values between events
    III.   Aggregates month to month returns to compute a market cap-weighted index tracking the broad US venture capital universe since 1996