Private Equity Perspectives | August 2024

Vanguard 2024 midyear private equity review and outlook

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- The first half of 2024 continued to see subdued levels of private equity (PE) deal and exit activity, and investors may question if now is the right time to commit to a PE fund. Vanguard research affirms the difficulty of timing equity markets, public or private, and we believe the long-term investment merits of a private equity program remain strong.[1]
- In the shorter term, high levels of dry powder,[2] resilient economic conditions, and the ability of managers to generate value through sales and profit growth may continue to reward investors who partner with high-quality managers.
- We discern fact from fiction in media headlines around PE's performance in a higher interest rate environment, private asset valuation methodologies, and PE's impact on employees and society. Vanguard believes the data support suitable investors maintaining their long-term financial plan and PE commitment programs.
- Vanguard has long acknowledged private equity's potential to improve investor outcomes through higher returns and increased diversification across market cycles.[3] Investors with the scale and resources to conduct manager diligence and maintain consistent access to top managers are likely to continue earning financial benefits from PE's inclusion in a portfolio.

1 See Vanguard, 2023a.

2 Dry powder refers to the uncalled capital commitments of private equity funds.

3 See Figure 4 for Vanguard's current private equity risk and return projections.

Private equity market in review

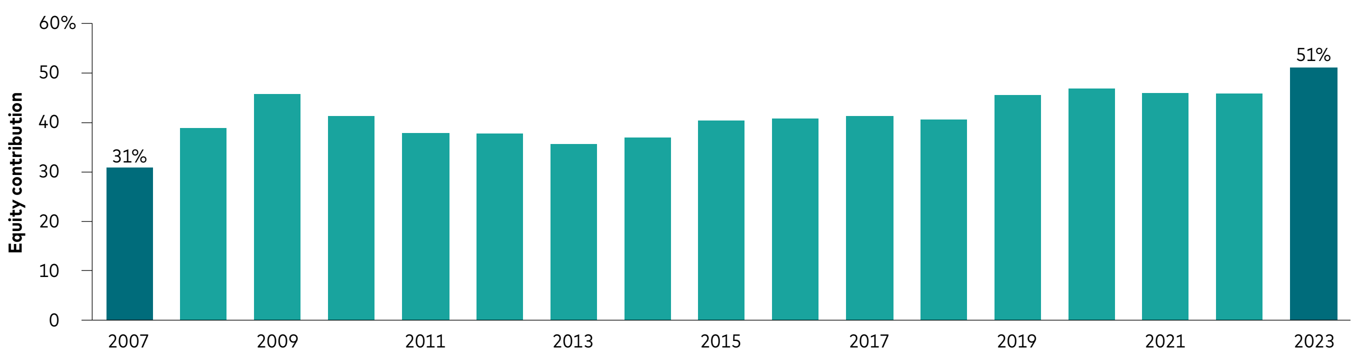
Global private equity transaction volumes remained subdued through the early part of 2024 as a combination of elevated rates, stubborn inflation, and macroeconomic uncertainty have produced a more cautious investment climate. Despite these headwinds, private equity markets continue to exhibit resilience and adaptability. Higher borrowing costs have accelerated the industry's decades-long shift toward more sustainable value creation models and disciplined capital allocation. Fundraising, widely considered a leading indicator of PE activity, is trending positively despite an industry-wide liquidity freeze. And a generational opportunity is forming in secondary markets as both general partners (GPs) and limited partners (LPs)[4] seek more diverse avenues for generating distributions and securing liquidity. Even with a cyclical slowdown in activity, we believe the long-term investment case for the asset class remains intact and PE should continue to improve investor outcomes over longer time horizons.

Deal and exit markets continue slow pace in 2024

Continuing a slowdown that started in the second half of 2022, global PE deal value totaled $621 billion[5] to close the first half of 2024, a decline of 8% from a year earlier. The speed and duration of the current interest rate cycle has altered the calculus for dealmaking, leaving wide gaps between buyers and sellers. With debt more expensive, sponsors have largely responded by using less leverage and more of their own capital in financing acquisitions. As shown in **Figure 1**, equity contributions for U.S. leveraged buyouts (LBOs) crossed the 50% threshold for the first time ever at the end of last year. We believe this trend underscores the industry's long-term shift away from financial leverage in favor of more organic value creation strategies. This should lead to more resilient capital structures for portfolio companies in the years to come.

FIGURE 1

Record equity contributions to U.S. LBOs reflect a shift away from financial leverage



Source: PitchBook LCD. Data through December 31, 2023.

4 A general partner (GP) is the manager of a PE fund. A limited partner (LP) is an investor in a limited partnership, the typical structure of a private equity fund. LPs aren't involved in day-to-day fund management.

5 Source: PitchBook data as of June 30, 2024. Includes buyout and growth equity strategies.

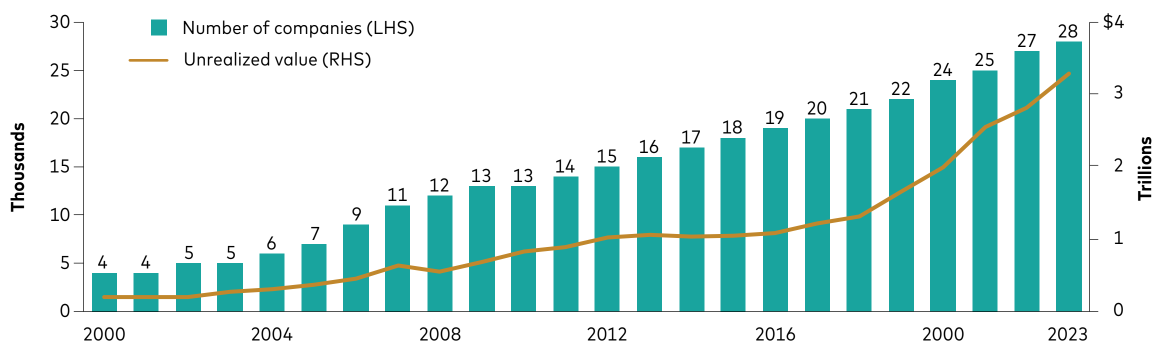
Exit markets also remain subdued, as exit value fell by 11%[6] globally in the first half of 2024, relative to the first half of 2023. Wide valuation gaps between buyers and sellers have caused sponsors to hold promising assets for longer rather than sell at perceived discounted prices. Reflecting these trends, the median holding period for buyout-backed exits has reached seven years, its highest level since 2014. With traditional exit channels continuing to sputter, we expect a wave of opportunities in secondary markets as LPs and sponsors seek alternate routes for securing liquidity and generating exits.

While it remains uncertain exactly when deal and exit markets will recover, we see several clues suggesting that a rebound in activity may be on the horizon.

First, global buyout funds are currently sitting on a record $1.2 trillion in dry powder, 26% of which is four years or older.[7] Unable to hold undrawn capital indefinitely, sponsors must soon decide whether to put their aging reserves to work or return it to LPs. We believe the former is the more likely scenario and GPs will be increasingly motivated to get deals done in the coming year. In addition, entry and exit multiples, widely viewed as leading indicators of deal and exit activity, have started to compress as sellers start to capitulate on price. Couple these trends with an industry record $3 trillion in unrealized exit inventory, as shown in **Figure 2**, and we believe a new phase of the PE investment cycle may soon be upon us, especially if interest rates moderate and macro conditions remain stable. Such market conditions have the potential to create an attractive vintage for PE investors.

FIGURE 2

Global buyout funds are holding a record $3 trillion in unrealized value



Median holding period for buyout-backed exits (years)	3.1	3.5	3.9	3.8	4.1	4.2	3.8	3.7	3.5	3.6	4.3	4.6	5.2	5.7	6.0	5.9	5.4	5.5	5.3	5.4	5.3	5.3	5.0	6.1

Notes: Shows data through fiscal year 2023 for global active buyout-backed companies and average holding period and data through Q2 2023 for unrealized value; excludes add-ons; buyout category includes buyout, balanced, coinvestment, and coinvestment multimanager funds.

Sources: Bain & Company, based on data from PitchBook and Preqin.

6 Source: PitchBook data, as of June 30, 2024.

7 Source: Preqin and Bain Global Private Equity Report 2024.

Fundraising stays resilient (for now)

Coming off its best three-year period ever recorded, global buyout fundraising has remained durable through the first half of 2024 with new commitments totalling $230 billion, up 17% from a year prior. The overall resiliency of the fundraising environment has been a welcome development considering the challenges faced by LPs during this stretch. Most notable of these was a denominator effect[8] in 2022 that inflated allocations to private markets and a struggling exit market that has produced limited distributions to fuel new commitments. While investors remain firmly committed to the asset class, participation in the rally has been largely unequal across strategies and signs of weakness have started to emerge.

In the face of macro uncertainty, cash-strapped LPs have skewed their commitments to larger funds of perceived higher quality. Mega funds[9] have accounted for half of all U.S. buyout fundraising over the past two years, with just two funds combining for over 50% of U.S. buyout capital raised in Q2 alone.[10] We believe the rising concentration in larger funds, coupled with the impact of higher rates, enhances the investment case for small and mid-market opportunities where managers rely less on leverage and financial engineering and more on bottom-up operational improvements. And elsewhere in the private markets, new allocations to venture capital and growth equity have declined 28% and 15%, respectively, from their first half 2023 levels as higher rates have led to a reset in valuations.[11] Moving forward, we believe avoiding a broader slowdown largely depends on sponsors' ability to exit their stockpile of assets efficiently and get cash back in the hands of LPs.

Growing secondary market is creating opportunities for liquidity

Another bright spot for PE markets has been the surging popularity of secondaries.[12] For an investor's PE portfolio, the inclusion of secondaries alongside traditional fund investments can help increase diversification across prior vintage years, provide exposure to mature portfolios, and generate earlier liquidity. Once considered a last resort for distressed sellers, secondaries grew faster than any other asset class in 2023 with fundraising closing at $76 billion, a 92% increase from the prior year.[13] Despite the influx of new capital, the strategy remains undercapitalized with less than two years of deal volume sitting in dry powder, a dynamic that, in our view, should support attractive pricing in the years ahead.

8 The denominator effect happens when an investor's PE portfolio value exceeds its target allocation because of a decline in value of other holdings in the investor's overall investment portfolio.

9 Mega funds are defined as private equity buyout funds with $5 billion or more in total commitments.

10 Source: Pitchbook data as of March 31, 2024.

11 Source: Pitchbook data as of June 30, 2024.

12 Secondaries are purchases of existing private equity assets by acquiring positions in formed funds or portfolios of direct investments.

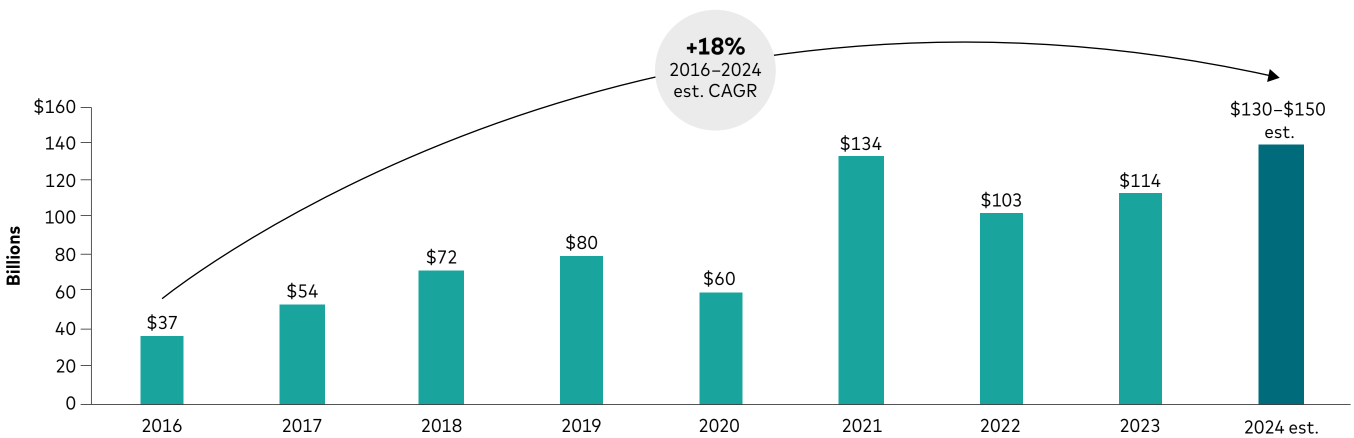
13 Source: Bain Global Private Equity Report 2024.

The emergence of a well-functioning secondary market has been a timely development for GPs and LPs alike. GPs have embraced continuation vehicles[14] as they seek to extend holding periods for high-performing assets while waiting for exit markets to recover. And for LPs, secondaries have become a viable avenue for rebalancing overweight PE exposures and generating much-needed liquidity against a backdrop of lower distributions. Looking ahead, we expect secondary volumes to remain elevated as global buyout managers seek off-ramps for their growing inventory of 28,000 unsold portfolio companies, 40% of which have been held for four years or more.[15] The sheer size of this backlog is unprecedented and has led to broad expectations of a record 2024 in terms of transaction volume, as shown in **Figure 3**.

FIGURE 3

The surging secondaries market has been a bright spot for PE

Secondary market deal volume (in $ billions)



Source: Evercore Secondary Market Survey Results 2024.

14 Continuation vehicles (also commonly referred to as "GP-led secondaries" or "complex secondaries") are funds that hold one or several portfolio companies acquired or rolled over from another fund managed by the same sponsor. This typically happens when the original fund is nearing the end of its lifespan and the sponsor expects to generate greater returns by developing the assets for longer. Existing investors often have the option to reinvest or roll their interests into the continuation fund or exit. In certain cases, new investors may join the continuation fund by making cash contributions.

15 Source: Bain Global Private Equity Report 2024.

Keys to PE investing success amid rising uncertainty

With decades-long tailwinds, such as zero rates and expanding multiples seemingly coming to an end, some investors may question whether an allocation to private equity is still worthwhile. To address these concerns, we believe it's worth noting that the PE return premium is not a new phenomenon, and the asset class has a long history of generating resilient returns in a variety of economically volatile periods. While we acknowledge that macro conditions are likely to be less accommodating than the prior decade, PE still presents an attractive risk-return opportunity over the long term for individual investors. In **Figure 4**, we show Vanguard's 10-year return and risk outlook for portfolios that include 10%, 20%, and 30% of their equity allocation to private equity relative to an all-public portfolio of 70% stocks and 30% bonds.

FIGURE 4

Private equity offers an opportunity for enhanced risk-adjusted returns

Portfolio risk and return projections with inclusion of private equity

		Private equity share of total equity allocation			Difference between 30% private equity scenario and 70/30 portfolio*	
Median 10-year expected risk and return projections	**70/30 portfolio***	**10%**	**20%**	**30%**	**Absolute**	**Percentage**
Return	5.9%	6.1%	6.4%	6.7%	+0.8%	+13.6%
Probability of meeting >6% annualized return	47.7%	52.4%	57.5%	63.8%	+16.1%	+33.8%
Volatility	11.4%	11.7%	12.1%	12.6%	+1.2%	+10.5%
Sharpe ratio	0.19x	0.21x	0.23x	0.25x	+0.06x	+24.0%

* 70/30 portfolio consists of a 70% allocation to equities (42% to U.S. equities, 28% to non-U.S. equities) and 30% allocation to fixed income (21% to U.S. bonds and 9% to non-U.S. bonds).

Notes: Expected returns, volatilities, and Sharpe ratios are median values from a distribution of 10,000 simulations. Portfolios have been optimized over a 10-year investment horizon.

Source: Vanguard calculations, using asset-return projections from the Vanguard Capital Markets Model.

IMPORTANT: The projections or other information generated by the Vanguard Capital Markets Model® (VCMM) regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from the VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of March 31, 2024. Results from the model may vary with each use and over time. For more information, see Appendix.

However, we acknowledge that capturing these excess returns is often easier said than done, especially against a more uncertain macro backdrop. With these challenges in mind, we believe the following actions will be critical for investors who wish to realize private equity's full range of benefits through the current market cycle:

Stay the course with private equity commitments. In the face of increasing uncertainty, investors may be tempted to alter their private equity commitment program. However, much like the public equity markets, timing investments in private equity tends to be futile. Recent Vanguard research has shown that private equity has historically generated stronger investment results during periods of economic uncertainty, and investors who decrease or pause their commitments during such periods experience lower investment gains.[16] As a result, we believe a consistent private equity commitment strategy that allows investors to stay invested through all stages of the market cycle is critical for achieving investment success.

Invest with highly skilled managers. General partners who rely on financial leverage and multiple expansion to drive returns are likely to face significant headwinds in the return to a more normal interest rate regime. We believe the most successful managers in this new era of investing will be those who can generate alpha organically by growing revenue, improving operations, and boosting margins. However, accessing these funds may prove challenging for individuals who lack the scale, resources, and relationships that are typical of larger investors. To solve for these challenges, investors may wish to consider partnering with a skilled fund-of-funds (FOFs) manager. Recent Vanguard research has shown that FOFs have the potential to enhance PE investment outcomes under certain conditions.[17]

Embrace diversification. Private equity exhibits significant performance dispersion across funds and strategies. We expect the divergence in performance between top and bottom quartile managers to widen as rates stay elevated and macro headwinds persist. However, investors can limit the vast range of potential outcomes this may bring by increasing diversification. Industry research provides evidence that implementing a broad-based private equity program with exposures across manager, stage, strategy, vintage, and region can improve downside protection and risk-adjusted returns over time.[18]

Whether investing in the public or private markets, investors can improve their chances of investment success by maintaining a long-term perspective and focusing on factors within their control. Investing with highly skilled managers, adhering to a strategic private equity commitment program, and embracing diversification have proven to be effective strategies for navigating prior market cycles and should continue to serve investors well through the current one as well.

16 See Vanguard, 2023b.

17 See Vanguard, 2024.

18 See Vanguard, 2024.

Addressing recent private equity misconceptions

Does private equity still outperform in a higher interest rate environment?

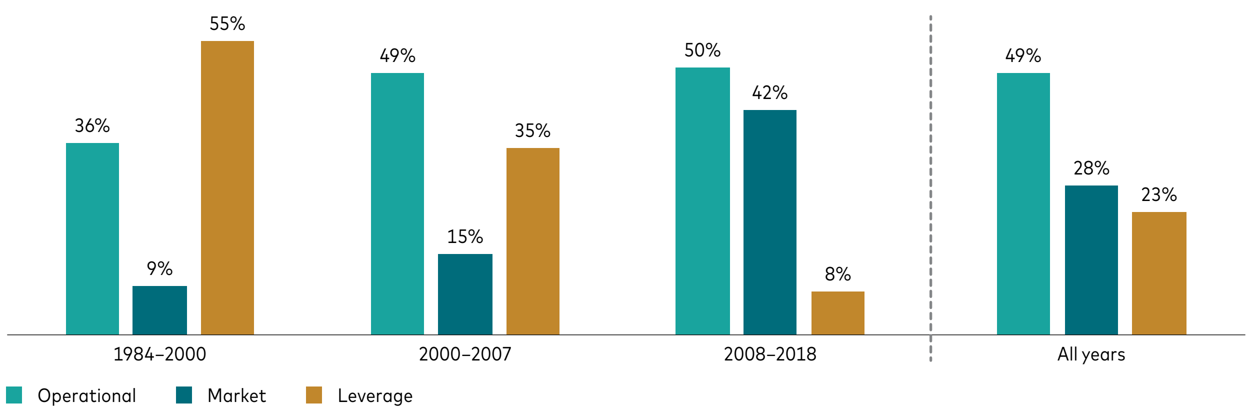
Following an extended period of relatively low interest rates, investors may question how much of the value that PE funds create is driven by financial leverage that is sensitive to increasing interest rates. The PE industry has evolved significantly over the past 50 years. We believe that capital structure has become increasingly commoditized and the best PE managers have robust value creation playbooks that are core to their competitive advantage. Our analysis in **Figure 5** shows that, since the 1980s, the largest source of value creation for PE fund investments has shifted from financial leverage to operational business improvements (sales and profit growth).

In addition, comparable public indexes to the private equity markets, such as the Russell 2000, now have leverage ratios (level of indebtedness relative to its enterprise value) that exceed their private equity-backed counterparts.[19]

FIGURE 5

PE value creation has shifted from financial leverage to operational improvements

U.S. PE value creation contribution by factor



Notes: The sample used in the analysis comprises 2,951 fully exited deals from 1984 through 2018, with $945 billion in combined equity investments and $1.9 trillion in total enterprise value. These transactions are estimated to cover about a quarter of the value of all global historical buyout activities with PE fund sponsors over this period. "Operational" includes revenue growth; earnings before interest, taxes, depreciation, and amortization (EBITDA) margin expansion; and EBITDA multiple expansion attributed to the general partner. "Market" includes EBTIDA multiple expansion and leverage attributed to comparative public market movements. "Leverage" includes excess leverage employed by the general partner above comparative public market leverage and the ratio of debt paydown (change in net debt from investment entry to exit) to total enterprise value at entry. The decrease in the leverage component is driven primarily by a decline in general partner excess leverage above comparative public market leverage. However, the contribution from deleveraging is negative for the 2000–2007 and 2008–2018 periods, which means that on average, general partners increased the level of debt while owning the company relative to entry.

Source: Binfare et al., 2022.

19 Source: Bloomberg and McKinsey. Leverage ratios (total debt to EBITDA) for U.S. buyout syndicated middle market deals and Russell 2000 were 4.1x and 6.5x, respectively, as of December 31, 2023.

We also looked to history to see how private equity has fared during rate-tightening cycles since 1985. **Figure 6** shows that the median and pooled PE fund vintages during these rising rate cycles matched or exceeded public equity market performance on average, and the top-quartile PE managers outperformed the public equity markets in all scenarios, delivering 10% average annualized outperformance. This underscores the importance of selecting an above-average manager to achieve your PE investing goals.

FIGURE 6

Top-quartile PE funds outperformed public equity in rising-rate environments

PE performance across interest rate-tightening episodes (1985–2015)

	Historical tightening action dates		Federal funds target rate (%)			U.S. PE absolute performance (net IRR)			U.S. PE Direct Alpha* vs. Russell 2000		
Private equity vintage years	**Initial**	**Final**	**Initial**	**Final**	**Total tightening (percentage points)**	**Pooled**	**Median**	**Top quartile**	**Pooled**	**Median**	**Top quartile**
1988, 1989	Mar 29, 1988	May 16, 1989	6.50%	9.81%	3.31%	19%	13%	24%	5% +	−0.3% −	9% +
1994, 1995	Feb 4, 1994	Feb 1, 1995	3.00%	6.00%	3.00%	34%	20%	40%	20% +	9% +	24% +
1999, 2000	Jun 30, 1999	May 16, 2000	4.75%	6.50%	1.75%	6%	0%	9%	−1% −	−6% −	2% +
2004, 2005, 2006	Jun 30, 2004	Jun 29, 2006	1.00%	5.25%	4.25%	9%	7%	13%	2% +	−1% −	5% +
Average across four cycles			**3.81%**	**6.89%**	**3.08**	**17.0%**	**10.0%**	**22%**	**6%** +	**0.2%** +	**10%** +

\+ PE outperformance

− PE underperformance

* Direct Alpha is a methodology that assesses the performance of PE versus public equity investments. For additional detail, please see the **Appendix**.

Notes: The Russell 2000 Index includes the smallest 2,000 companies in the Russell 3000 Index (which is composed of the largest 3,000 companies by market capitalization). The Russell 2000 Index is widely used for PE performance comparison because it's one of the broadest benchmarks for U.S. small-cap companies, which better reflects the PE investable universe relative to indexes that contain large-cap companies such as the Russell 3000 Index or the Standard & Poor's 500 Index. IRR is internal rate of return.

Sources: The Burgiss Group, LLC, and the Federal Reserve Bank of St. Louis. PE data are from the Burgiss dataset of all U.S. PE funds (buyout, venture, growth) with performance through June 30, 2023. As of January 1, 2024, the federal funds target rate was 5.25% to 5.50%.

Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Private equity's impact on companies and society

Negative headlines about private equity industry practices are increasingly commonplace. However, academic research demonstrates that private equity-backed companies, in aggregate, generate positive employment, productivity, and governance outcomes.

Academic research suggests that private equity investment in companies has a positive impact on employment and productivity,[20] though the impact may vary based on the type of transaction and market environment. An analysis of thousands of buyout targets and millions of control firms from 1980 to 2013 found that employment increased on average by 2% two years after the transaction year. In the most common type of private equity transaction—buyouts of private firms—employment expanded by 15%. However, in buyouts of publicly traded firms, employment shrank by 12% (Davis, 2021). PE investment even has positive spillover effects to public companies in the same industry. A one-standard-deviation change in PE investment was shown to increase employment by 0.6% and increase productivity 0.8% at public companies in the same industry (Aldatmaz, 2019).

Research also finds that PE investments in firms, in aggregate, have positive non-financial outcomes as well, including better management practices, improved workplace safety, and health code adherence.[21]

PE's involvement specifically in the U.S. health care system has received recent media scrutiny, implying an outsized and growing role. On the contrary, PE-backed providers are estimated to represent just 3% of projected U.S. health care provider revenue in 2024,[22] or approximately $118 billion. Large public health care firms can often have provider businesses of comparable size. PE investment in health care providers dates to the 1980s and has indeed grown as a proportion of the health care industry, broadly in line with private equity's growth overall, reaching a peak of 8% of PE deals in 2018. Since 2018, however, PE investment in health care has declined as a proportion of total PE investment to 6%. Current PE deal activity in hospitals and skilled nursing facilities is near zero, and there has not been a major PE investment in a U.S. hospital or health system since 2018.[23]

There has also been debate around whether health outcomes change with private equity ownership. In a recent robust review of the available academic research, no significant difference in health care outcomes between PE or other ownership types was found.[24] Specifically in studies focused on nursing home patient outcomes, which have been the subject of recent media headlines, we found that the most robust data shows that PE ownership was associated with a decrease in probability of COVID-19 infections and deaths,[25] and no statistically significant differences in staffing levels or deaths of any cause between PE and other nursing home ownership types.[26]

20 Productivity is a commonly studied economic indicator, often measured by the ratio of employees to revenue or profitability.

21 See Cohn, et al. (2020), Bloom, et al. (2016), and Bernstein, et al. (2013).

22 Source: Pitchbook. Quantifying PE Investment in Healthcare Providers (2024).

23 Source: Pitchbook. Quantifying PE Investment in Healthcare Providers (2024).

24 See Kaplan, 2024.

25 See Gandi, Song, and Upadrashta, 2022.

26 See Braun, et al., 2020.

Private equity-backed company boards have also been shown to have certain governance advantages.[27] In a survey by McKinsey, private equity-backed company boards were rated as superior in strategic leadership, performance management, and stakeholder management. The study noted that this superior effectiveness was driven by public company directors' greater focus on risk avoidance than on value creation and PE-backed company directors' greater level of engagement. On the other hand, public company boards earned their best scores in governance and risk management. Public boards drew on a broader range of insights and experience to better identify and manage potential risks.

For investors, it is crucial to look past controversial headlines and focus on pertinent data essential for realizing long-term investment success.

Private equity valuations: looking past the noise

Recent media coverage has scrutinized the appraisal-based valuation methodologies of private asset firms. Private equity funds invest in less liquid assets that don't actively trade in arms-length transactions and hence have specific characteristics that make valuation challenging. Several factors—including subjectivity, lack of definitive rules, inputs subject to varying degrees of reliability, the potential for conflicts of interest in the valuation process, and increasingly complicated investment structures—have focused attention on valuation issues in the industry.

When selecting a manager, it's critical to partner with a firm that has strong risk and internal valuation controls. Valuation committees should have elements of independence and authority. Internal approvals should include strong debate among investment professionals and committees. An appropriate risk culture should incentivize private equity fund managers to avert the reputational damage to their organization that can arise from flawed or heavily scrutinized valuations. Vanguard believes partnering with a reputable firm that has a strong risk culture is paramount and should be a critical determinant of an advisor selection process.

While academic research on this topic is limited, data show that the private equity industry has been conservative, on balance, with its appraisals of company values. Over the past 12 years, private equity firms marked up their company valuations at exit 70% of the time, relative to the last quarterly mark (Bain, 2023). In another analysis using a large dataset of buyout and venture funds, researchers also found that top-performing funds understated valuations, implying a level of prudence and conservatism.[28]

27 See McKinsey, 2008.

28 See Brown, Gredil, and Kaplan, 2019.

Conclusion

The first half of 2024 continued to see subdued levels of private equity deal and exit activity. Investors may question if now is the right time to make a commitment to a private equity fund. Vanguard research affirms the difficulty of timing the equity markets, public or private, and believes the long-term investment merits of a private equity program remain strong. In the shorter term, high levels of dry powder and resilient economic conditions and the ability of high-quality managers to generate value through sales and profit growth may continue to reward investors who partner with high-quality managers.

Media headlines around PE's performance in a higher interest rate environment, private asset valuation methodologies, and PE's impact on employees and society should not deter suitable investors from continuing a PE commitment program and sticking with their long-term financial plan.

Vanguard has long acknowledged the ability of private equity to potentially improve investor outcomes through higher returns and increased diversification across market cycles. Investors with the scale and resources to conduct manager diligence and maintain consistent access to top managers are likely to continue earning financial benefits from private equity's inclusion in a portfolio.

Appendix

More about the Direct Alpha methodology

Direct Alpha refers to the Gredil, Griffiths, Stucke Direct Alpha method. It is a measure of annualized excess return and compares the relative performance of the private market investment with the stated index as of the measurement date; the calculation is an internal rate of return, based on the series of fund cash flows and the residual value, discounted to a single point in time using the respective index returns; the cash flows are discounted to the same point in time to effectively eliminate the impact of any changes in the stated public equity index from the private market cash flows. For example, a direct alpha of 3.5% indicates that the private investment has generated an annualized excess return of 3.5% over the stated index.

More about the Vanguard Capital Markets Model (VCMM)

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and overtime.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The Vanguard Capital Markets Model is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes, as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

Asset classes and proxy indexes

- **U.S. equity:** MSCI US Broad Market Index
- **Non-U.S. equity:** MSCI All Country World ex USA Index
- **U.S. bonds:** Bloomberg US Aggregate Index
- **Non-U.S. bonds:** Bloomberg Global Aggregate ex-USD Index
- **Private equity:** MSCI ACWI + 350 basis points

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Market risk: Private equity, as a form of equity capital, shares similar economic exposures as public equities. As such, investments in each can be expected to earn the equity risk premium or compensation for assuming the nondiversifiable portion of equity risk. However, unlike public equity, private equity's sensitivity to public markets is likely greatest during the late stages of the fund's life because the level of equity markets around the time of portfolio company exits can negatively affect PE realizations. Though PE managers have the flexibility to potentially time portfolio company exits to complete transactions in more favorable market environments, there's still the risk of capital loss from adverse financial conditions.

Asset liquidity risk: Various attributes can influence a security's liquidity; specifically, the ability to buy and sell a security in a timely manner and at a fair price. Transaction costs, complexity, and the number of willing buyers and sellers are only a few examples of the factors that can affect liquidity. In the case of private equity, while secondary markets for PE fund interests exist and have matured, liquidity remains extremely limited and highly correlated with business conditions. LPs hoping to dispose of their fund interests early—especially during periods of market stress—are likely to do so at a discount.

Funding liquidity risk: The uncertainty of PE fund cash flows and the contractual obligation LPs have to meet their respective capital commitments—regardless of the market environment—make funding risk (also known as commitment risk) a key risk LPs must manage appropriately. LPs must be diligent about maintaining ample liquidity in other areas of the portfolio, or external sources, to meet capital calls upon request from the General Partners ("GPs").

Valuation risk: Relative to public equity, where company share prices are published throughout the day and are determined by market transactions, private equity NAVs are reported quarterly, or less frequently, and reflect GP and/or third-party valuation provider estimates of portfolio fair value. Though the private equity industry has improved its practices for estimating the current value of portfolio holdings, reported NAVs likely differ from what would be the current "market price," if holdings were transacted.

Selection risk: Whether making direct investments in private companies, PE funds, or outsourcing PE fund selection and portfolio construction to a third party, investors assume selection risk. This is because private equity doesn't have an investable index, or rather a passive implementation option for investors to select as a means to gain broad private equity exposure. While there are measures an investor can take to limit risk, such as broad diversification and robust manager diligence, this idiosyncratic risk can't be removed entirely or separated from other systematic drivers of return. Thus, in the absence of a passive alternative and significant performance dispersion, consistent access to top managers is essential for PE program success.

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