

Fresno County Employees' Retirement Association

Private Equity Valuations: Are They Immune To Market Movements?

October 2022

We Enrich Lives & Safeguard Futures

- Do the right thing
- Integrity, candor and collaboration
- The pursuit of excellence
- A spirit of competition that inspires innovation
- Promoting equity and inclusion from within





What is Private Equity?

Private Equity Structure



From WikiPEdia, the Hamilton Lane encyclopedia ▶ Investments in assets or financial instruments that are not listed on an exchange

- Purchase of family owned/ privately held companies
- Take-privates
- Growth capital for early stage companies

Investors (Limited Partners)

- LPs provide capital for the fund



Private Equity Firm (General Partners)

- GPs manage the fund



Private Equity Fund (Limited Partnerships)

Portfolio Company A

Portfolio Company B

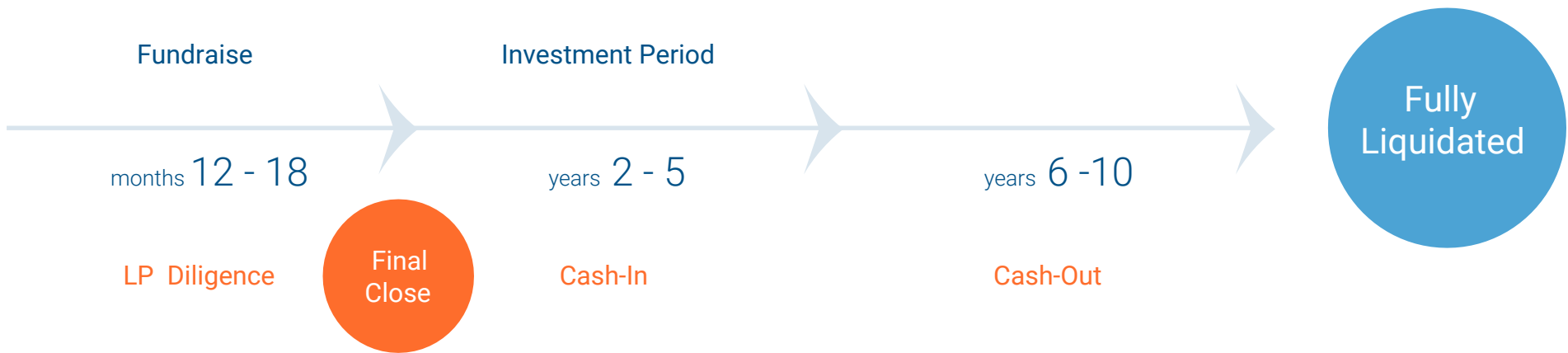
Portfolio Company C

Portfolio Company D

Portfolio Company E

*Representative clients and investors were included based on account size, geographic location, and account type. The identification of these clients and investors does not serve as an endorsement of Hamilton Lane or the services provided. These clients and investors utilize various services of Hamilton Lane and do not represent one specific account type.

How It Works



How it Works

The Process

1. Capital Commitment

- Investor makes a capital commitment to a fund manager in year 1

2. Investment Period

- Over the next 4-5 years the fund manager calls capital for investments in portfolio companies



3. Harvesting Period

- Typically, in years 6-10, fund manager begins to exit portfolio company investments, sending capital back to investors in the form of distributions. Partial realizations can occur as early as year 2-3.

The Terms

- Capital Committed: An investor's financial obligation to provide a set amount of capital to the fund
- Capital Contributions: Capital contributed from an investor's capital commitment to fund partnership investments, organizational expenses and management fees
- Distributions: Cash or stock disbursed to the investors from a fully or partially realized investment

Understanding Private Equity Exposure and Cash Flows

Commitment \neq Exposure ➤ commitment pacing requires careful planning

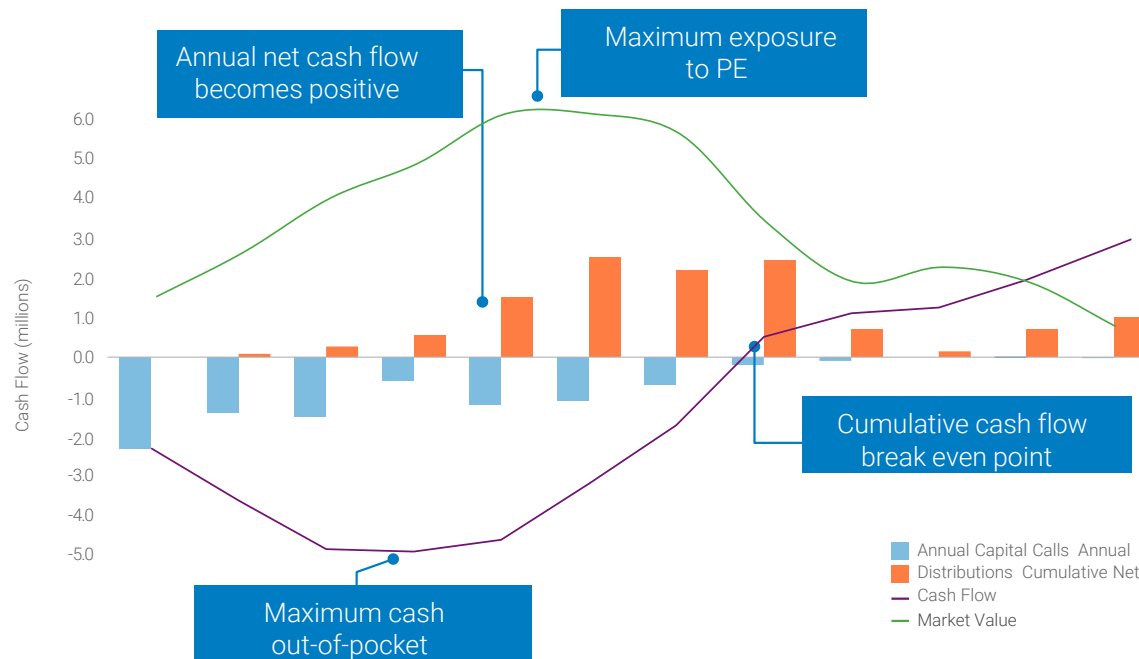
- \$10M commitment never fully exposed

As cash goes out, cash also comes back in ➤ while PE is illiquid, cash returns can be generated as early as 2-3 years and the entire commitment is not fully exposed all at once

Example:

- Maximum cash out-of-pocket is roughly half of commitment
- Cash flow positive for the year in years 5-6
- Full commitment returned in form of distributions in years 7-8

Example Cash Flow Profile: \$10M Commitment to a Fund-of-Funds by Year



Please refer to endnotes in Appendix.

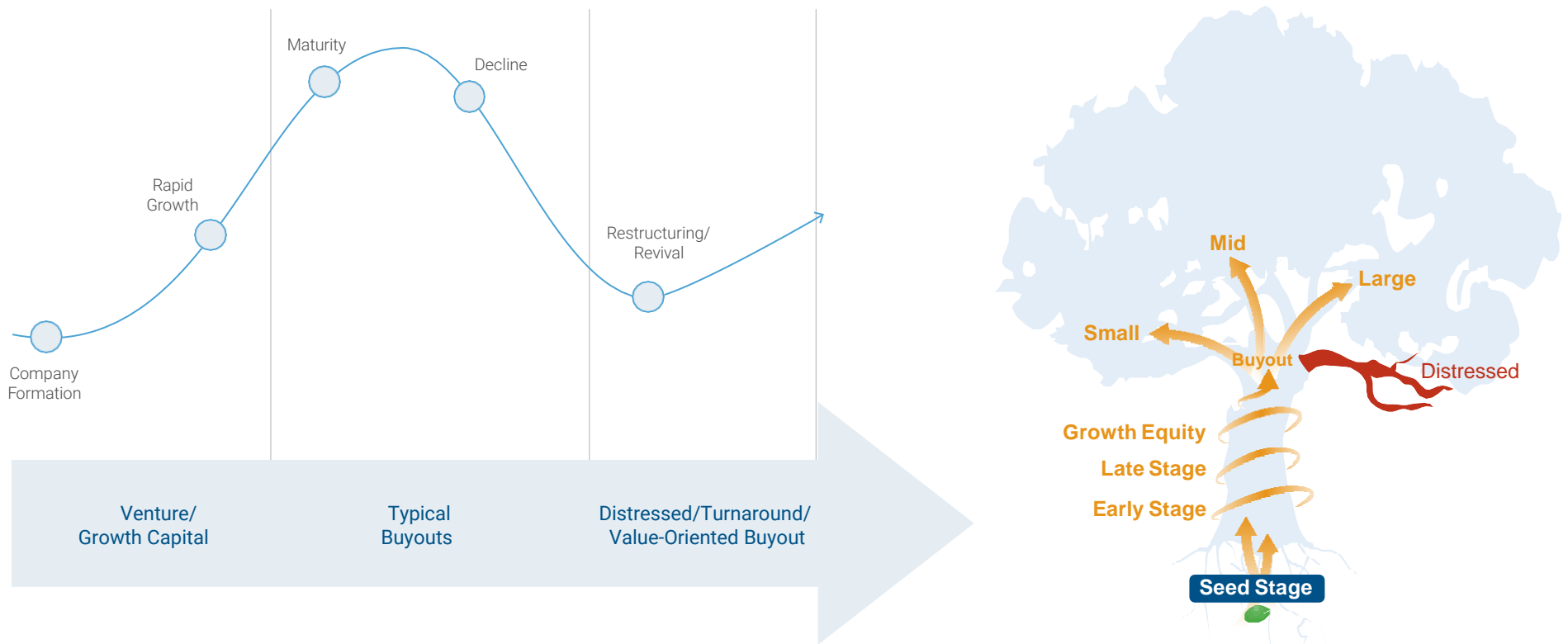


Types of Private Equity

Company Lifecycle & Applicable Private Equity Strategies

Private equity managers invest in companies of critical stage to create value

- Create/develop new companies or new technologies
- Acquire growth companies in fragmented industries
- Restructure, refocus or revitalize inefficient operating companies
- Lend to companies unable to borrow from banks



Private Equity Strategies

Primaries

- Represent the core of a private markets portfolio
- Diversification across time, geography, and strategy- not an “indexed approach”
- Access to top-tier managers as the foundation of the portfolio
- Use managers and strategies as building blocks
- Target sub-strategies to refine portfolio to meet investment objectives

Secondaries

- Effective portfolio management tool
- Mitigate J-curve by purchasing at a discount
- Mature assets with strong liquidity profiles
- Shorter fund life reduces portfolio duration
- Existing investments eliminate blind pool risk

Co-Investments

- Investing alongside core managers in their area of expertise
- Deal flow driven by primary fund allocation
- Potential for enhanced returns
- Cost effective way to invest in private markets- no fees to GP
- Add targeted exposure to specific industry, geography, and vintage year

Keys to Private Equity Manager Success

A successful manager increases the value of its portfolio companies and is able to exit these companies at prices well above cost

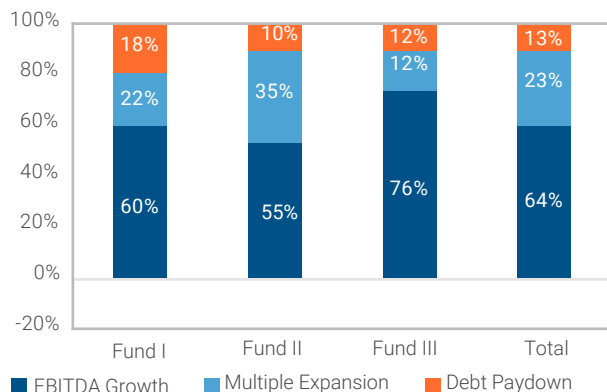
How Does a GP Add Value

- Low Purchase Price/Higher Sale Price
- Structure/Financing
- Earnings Improvement
- Strategic Reorientation

How Do GPs Exit Investments

- IPO
- Strategic/Financial Sale
- Merger
- Refinancing

Value Creation



Example: Private Equity Fund VI - Prior Investment Performance

(\$mm) Fund	Total Portfolio Gross IRR	Realized Portfolio Gross IRR	Unrealized Portfolio Gross IRR
Fund I	31.4%	31.4%	
Fund II	34.5%	38.9%	8.9%
Fund III	27.4%	31.0%	12.4%
Fund IV	14.8%	20.3%	13.6%
Fund V	15.0%	40.7%	13.9%
Total	24.4%	34.1%	13.3%

It is critical to understand how GPs generate value and distinguish between the realized/unrealized performance in a fund

For illustrative purposes only. Does not represent an actual portfolio managed by Hamilton Lane.



Valuations



Valuation Methodologies

- PE valuations are “lagged” by 1 quarter; takes time for GPs to complete valuation process (45-75 days)
- Intrinsic vs Relative value

Comparable Companies Analysis

- Compares Portfolio Company to set of peers, often publicly traded
- Uses ratios of peers to value private company (i.e., EBITDA multiple)
- Easy to calculate and keep current
- Susceptible to public market movements

Discounted Cash Flows (DCF)

- Values company based on financial outlook
- Uses modeling of future cash flows
- Requires detailed models and estimates / assumptions

Precedent Transactions

- Values company using recent transaction(s) of similar companies
- Less common than other methods
- Transactions can quickly be outdated
- Reliable sample set not always available

Most Recent Fundraising Round

- Used in Venture Capital deals
- Uses the most recent fundraising round's valuation for the company

Various methodologies can be used together to provide a value using both intrinsic and relative value

Valuation Methodologies – Discounted Cash Flows

- An exercise in the Time Value of Money
- Estimates the value of an investment based on expected future cash flows
- Determines the present value of future cash flows using a discount rate

Step 1: Forecast Expected Cash Flows

Step 2: Choose Discount Rate

Step 3: Discount Cash Flows back to Present Day

Advantages

- Useful tool to help decide whether to invest
- Can be applied to a variety of investments where cash flows can reasonably be estimated
- Can be tweaked to provide for different scenarios

Disadvantages

- Involves estimates, not actual figures
 - Only as good as the inputs
- Future cash flows can be impacted by a variety of unforeseen factors
- Discount rates can vary

Valuation Methodologies – Comparable Company Analysis

- Comparable Company Analysis determines value of an investment by using metrics of other businesses of similar size in same industry
- Relatively easy to calculate and maintain
- Susceptible to public market movements

Establish Peer Group

- Determine peers based on:
 - Size
 - Industry
 - Geography

Compile Valuation Ratios

- For the peer set, gather ratios to be used for valuation
- Common ratios include:
 - Enterprise value to EBITDA
 - Enterprise value to Sales
 - Price to earnings
 - Price to book
 - Price to sales

Apply Ratios to Target Company

- Use the appropriate ratio(s) from the peer set and apply to target company

Valuation Methodologies – Precedent Transactions Analysis

- Precedent Transaction Analysis uses prices paid for similar companies in the past to indicate a company's value
- Similar to CCA: determine peer set and establish multiples/ratios
- Important to identify the most appropriate transactions

Advantages

- Uses publicly available information
- Straightforward approach to determine valuation
- Provides general view of market demand for asset

Disadvantages

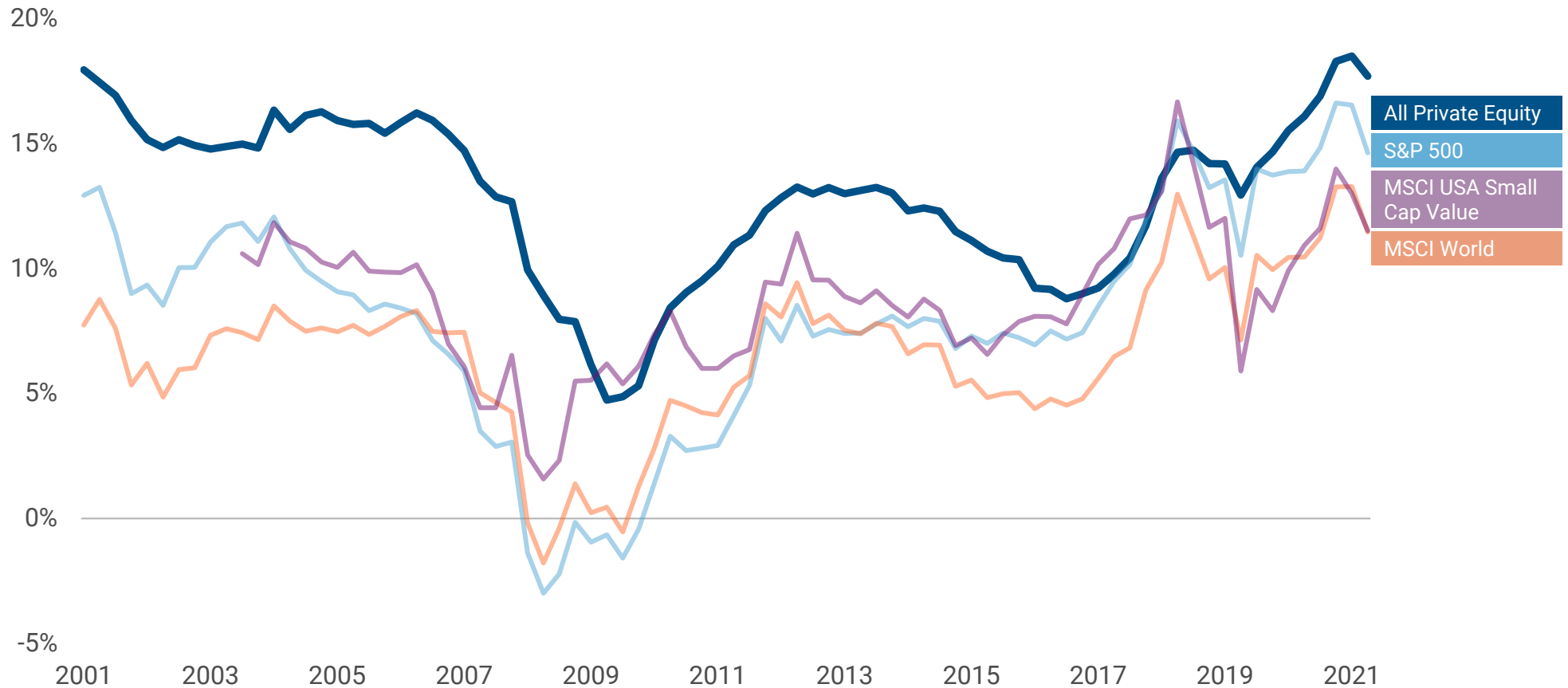
- Dataset of applicable transactions can be limited
- Not all transactions are the same; nuances for individual deals are important
- Prior transactions can quickly become outdated



Private Equity Performance

Rolling Performance

All Private Equity 10-Year Rolling TWRs



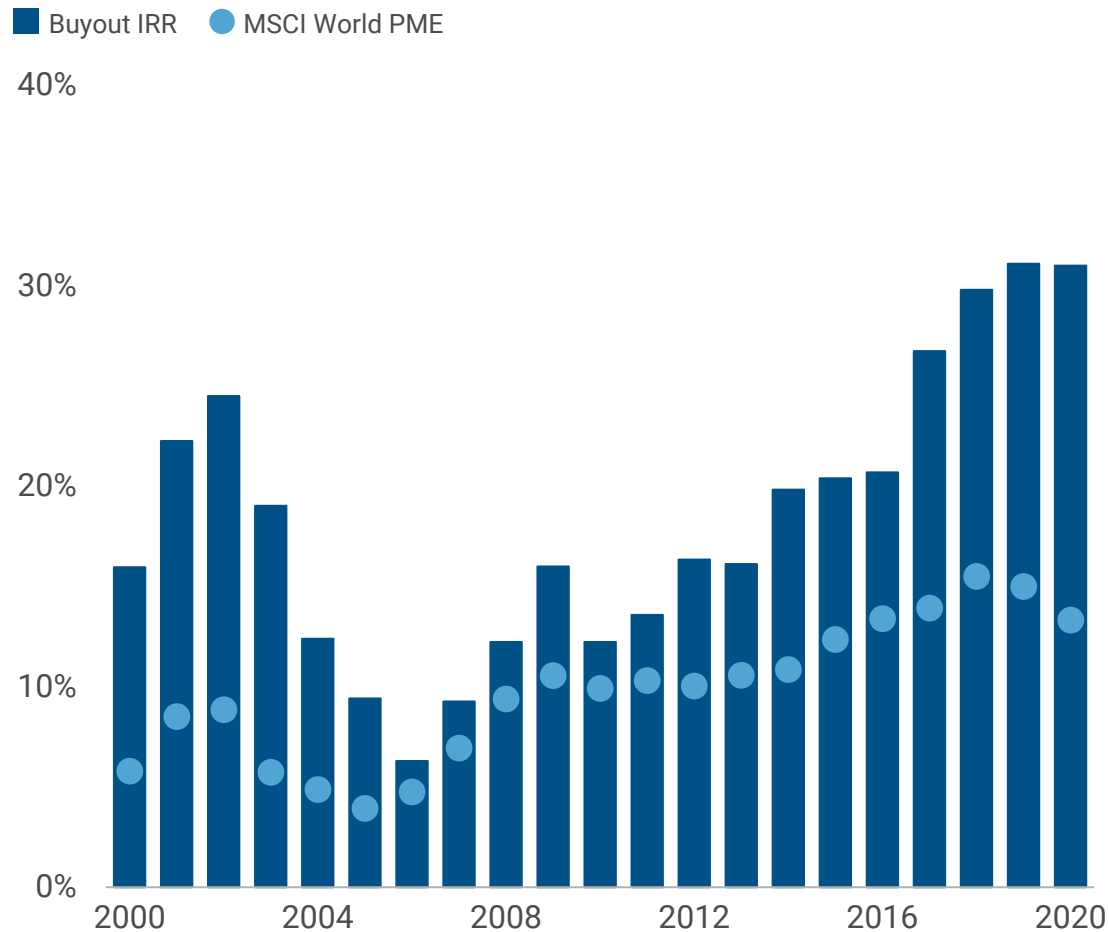
- Private equity has bested liquid equities over most 10-year time periods
- Private equity has even done so in the most recent period of strong public market performance

Source: Hamilton Lane Data via Cobalt, Bloomberg (August 2022)

Pooled Returns by Vintage Year

Buyout IRR vs. PME

By Vintage Year



- Buyout has outperformed global equities in every vintage year by an average of 860 bps

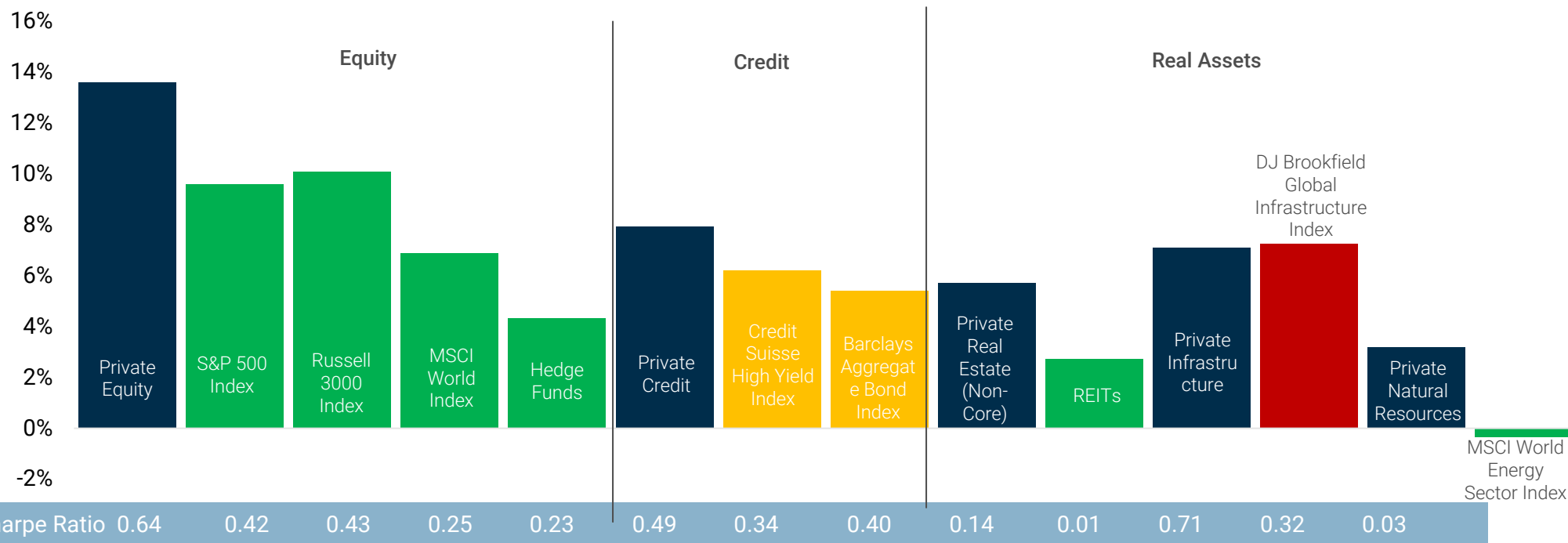
Source: Hamilton Lane Data via Cobalt, Bloomberg (August 2022)

Horizon Returns

15-Year Asset Class Performance

Annualized Time-Weighted Return as of 3/31/2022

■ Private Markets Outperforming by 300+ bps
 ■ Private Markets Outperforming by 0–300 bps
 ■ Public Markets Outperforming



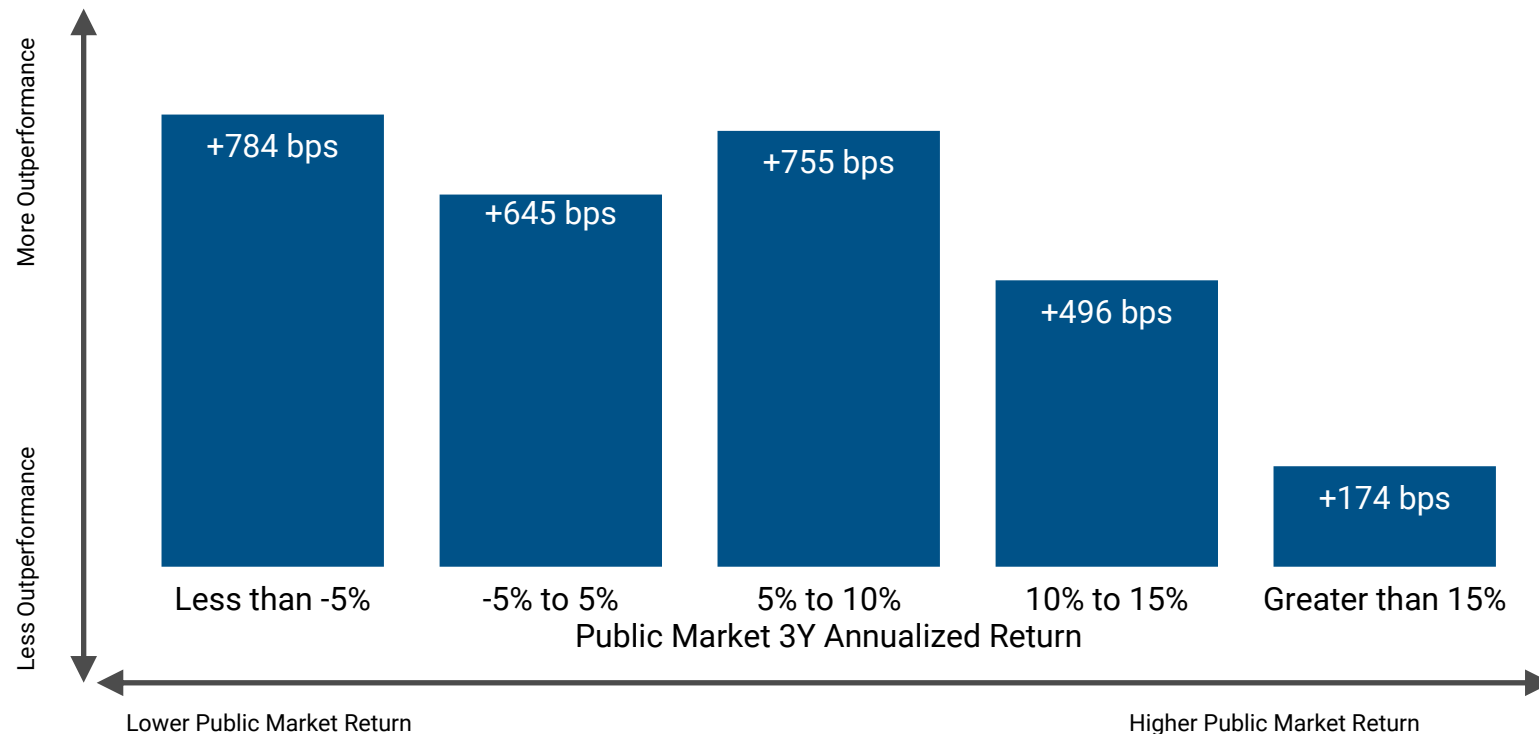
- Over a long-term horizon, private equity and private credit outperform on an absolute and risk-adjusted basis (even after de-smoothing volatility)
- Real estate and infrastructure performance heavily influenced by GFC-era funds. More recent vintages have posted stronger performance
- The benchmark and timeframe you use matters

Indices used: Hamilton Lane All Private Equity with volatility de-smoothed; S&P 500 Index; Russell 3000 Index; MSCI World Index; HFRI Composite Index; Hamilton Lane Private Credit with volatility de-smoothed; Credit Suisse High Yield Index; Barclays Aggregate Bond Index; Hamilton Lane Private Real Estate with volatility de-smoothed; Hamilton Lane Private Infrastructure with volatility de-smoothed; Hamilton Lane Private Natural Resources with volatility de-smoothed; FTSE/NAREIT Equity REIT Index; DJ Brookfield Global Infrastructure Index; MSCI World Energy Sector Index. Geometric mean returns in USD. Assumes risk free rate of 2.6%, representing the average yield of the ten-year treasury over the last fifteen years.

Source: Hamilton Lane Data via Cobalt, Bloomberg (August 2022)

Performance by Public Market Regime

All PE Average 3Y Excess Return by S&P 500 Return Regime

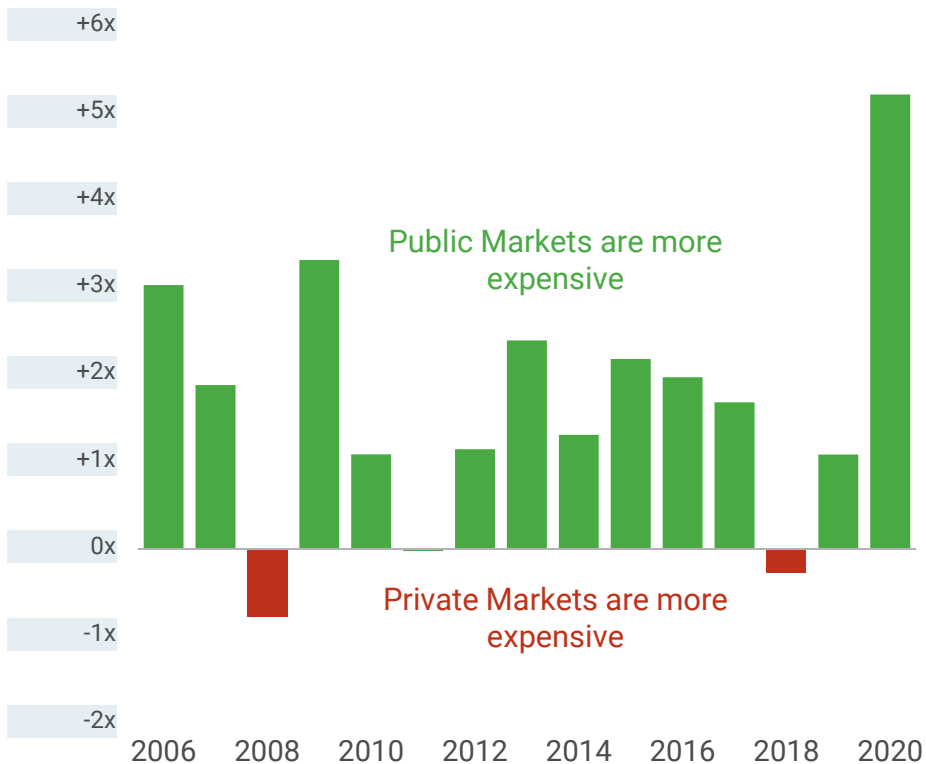


- Private equity outperformance is narrower in “high return” environments; wider in “low” and “average” return environments
- We’ve been in a “high return” environment recently, but many investors expect a shift to a lower return environment

Relative Valuations

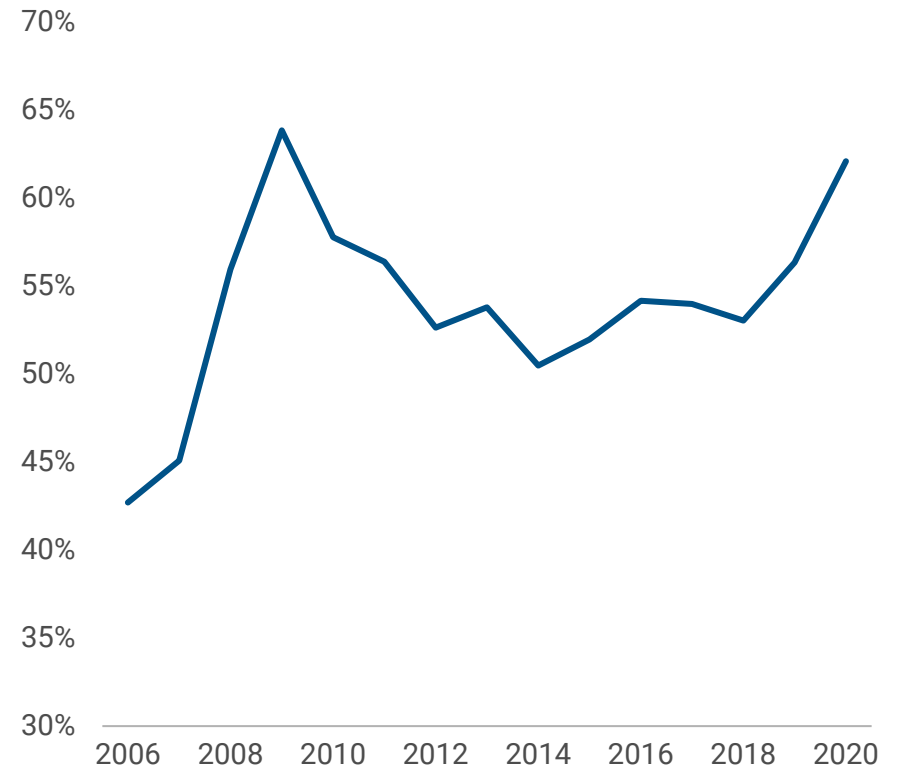
MSCI World Buyout Deal Purchase Price Spread¹

Difference in EV/EBITDA, Median by Deal Year



Buyout Deals % Equity Contributed²

Median by Deal Year



- Despite increase in multiples, private markets are at the highest discount to public multiples in the last 15 years
- Equity contributions in developed markets have remained above pre-GFC lows

Source: 1. Hamilton Lane Data, Bloomberg (January 2022) 2. Hamilton Lane Data (January 2022)

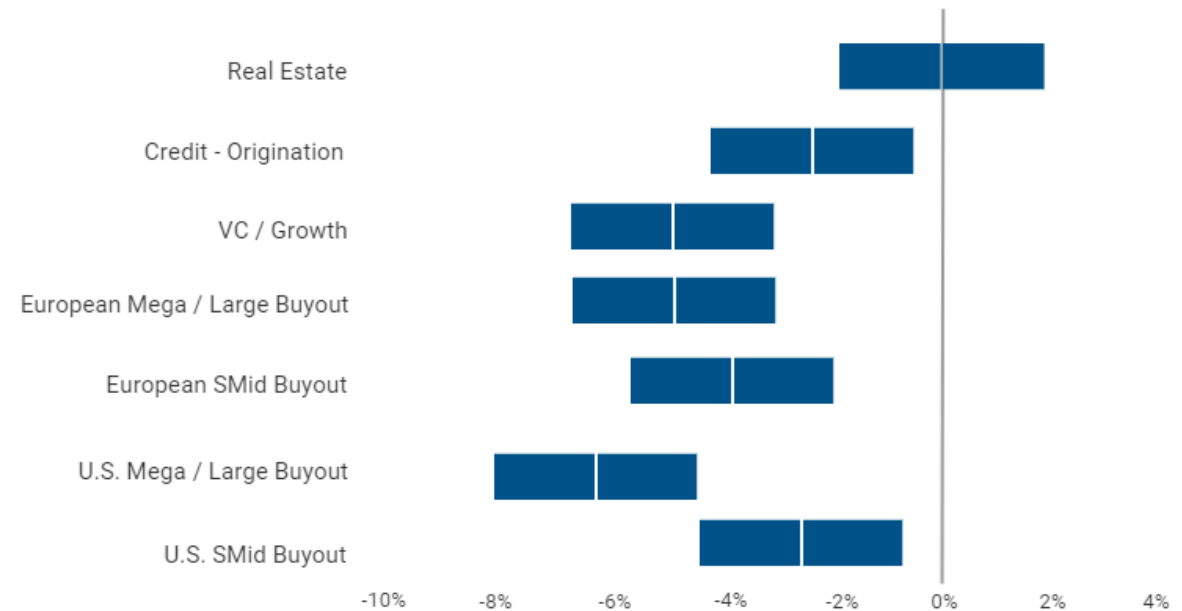


What Does It All Mean?

To finally answer the question...

- No, PE is not immune to market movements
- Historically, PE has outperformed public markets, especially during times of volatility / low returns
- Asset class, sector, geography, etc. all effect the impact of public market movements on PE
 - Current downturn has biggest impact on VC/Growth (tech) and large buyout funds

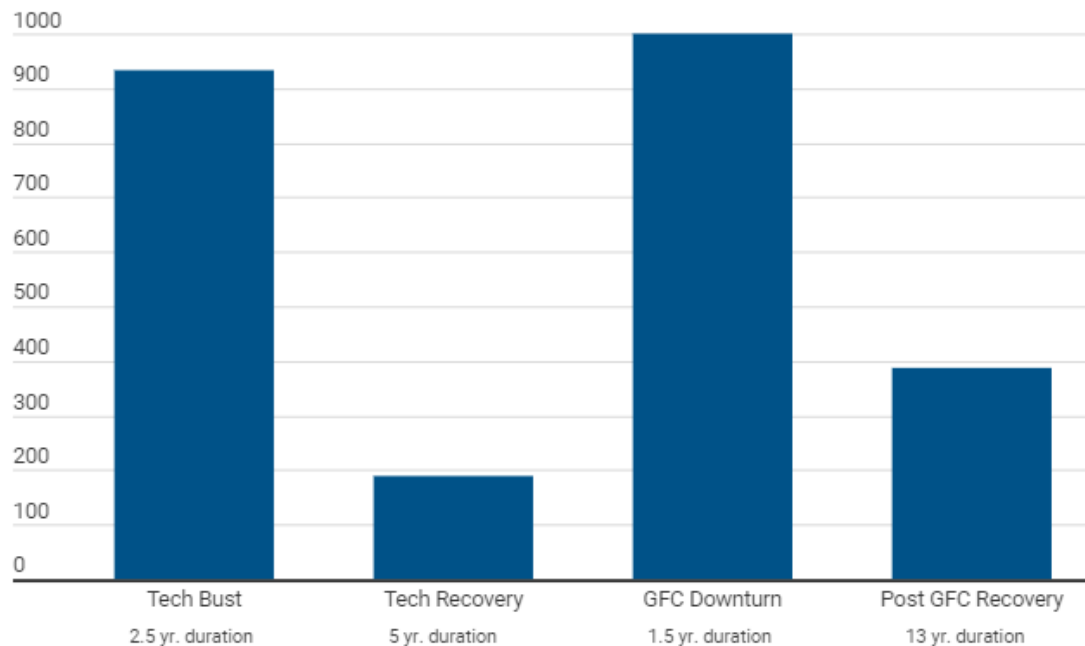
2022 Q2 ESTIMATED RETURNS BY STRATEGY



Please refer to endnotes.
Source: Hamilton Lane Data (July 2022)

Aren't GPs just avoiding write downs?

PRIVATE EQUITY OUTPERFORMANCE (BPS)



Source: Hamilton Lane Data, Bloomberg, and FRED St. Louis (June 2022)

All Private Equity is defined as Buyout, Venture Capital, and Growth Equity funds. PME Index used is MSCI World Index. Returns shown are point-to-point calculations. The point-to-point calculations listed are inclusive of all funds active during that time period. The PTP IRRs and PMEs are a demonstration of performance during the given recessions and expansion times. "Peak to Trough" represents the quarter of the lowest and highest MSCI World Index value over the given time frame.

- One (cynical) view: PE outperforms public markets because GPs take longer to write down their investments
- GP marks can already be conservative, holding at lower valuations than public comps
 - Evidence: GPs tend to exit companies at a premium to holding value
- PE has structural mechanisms for support of struggling companies that public companies don't have
 - Calling additional capital from LPs, access to capital markets
- Majority stake transactions are not necessarily apples-to-apples compared to instant liquidity of a small minority position (in public companies)

Tech bust from 4/1/2000 - 9/30/2002; Post-tech bust boom from 10/1/2002 - 9/30/2007; GFC from 10/1/2007 - 3/31/2009; Post-GFC Boom from 4/1/2009 - 12/31/2021



Appendix



FCERA/HL Timeline

- October 2007: Hamilton Lane PE Fund VI

- FCERA committed \$70 million

- March/July 2016: Hamilton Lane PE Fund IX

- FCERA committed \$100 million in total

Hamilton Lane selected for separately managed account with FCERA in early 2017

- May 2017: Hamilton Lane Secondary Fund IV

- FCERA committed \$75 million

- November 2017: Contract signed

- HL to invest \$250 million over 3 years on behalf of FCERA

- December 2017: HL made first investment

- Avista Capital Partners IV – part of secondary allocation

- January 2018: Completed data transition

- Completed upload of 10 legacy investments onto HL platform

- April 2018: First primary investment

- \$7.5 million commitment to Kelso Investment Associates X

- November 2020: Tranche 1 fully committed

- \$250 million closed across 27 fund investments

- April 2021: 1-year tranche approved

- \$85 million to be allocated to 5 new fund investments*

- January 2022: 3-year tranche approved

- \$375 million to be allocated in total over three years

The Separate Account Mandate was amended March 2020 to reallocate the remaining \$15m for Secondaries to be used for Primary investments

Portfolio Snapshot

- Portfolio performance was negative for the quarter
 - Net Value Loss of \$9.6M during the quarter
 - Negative one-quarter point-to-point IRR of (2.02%)
 - Since Inception Net IRR, inclusive of management fees paid to General Partners of 14.72%

Client Overview

1998
Program Inception

2007
HL Relationship Inception

Diversified Private Equity
Private Market Strategy

\$5,609.7M
Plan size as of 6/30/2022

8.31%
Current Private Markets Allocation

Russell 2000
Public Benchmark

Fresno County Employees' Retirement Association Portfolio

(USD in Millions)	3/31/2022	6/30/2022	Change
Total Active Legacy Partnerships	10	10	-
Total Active HL Partnerships	35	41	6
Exited Investments	1	1	-
Active GP Relationships	33	34	1
Capital Committed ¹	\$812.3	\$884.0	\$71.7
Unfunded Commitment	\$271.9	\$328.1	\$56.2
Paid-In Capital	\$580.5	\$596.9	\$16.4
Capital Distributed	\$545.1	\$558.7	\$13.7
D/PI Ratio	0.9x	0.9x	-
Market Value	\$473.1	\$466.2	(\$6.9)
Total Value Multiple (TVPI)	1.8x	1.7x	(0.1x)
Avg. Age of Commitments	6.6 years	6.4 years	(0.2 years)

Since Inception IRR Performance

Portfolio Net IRR ²	15.02%	14.72%	(30 bps)
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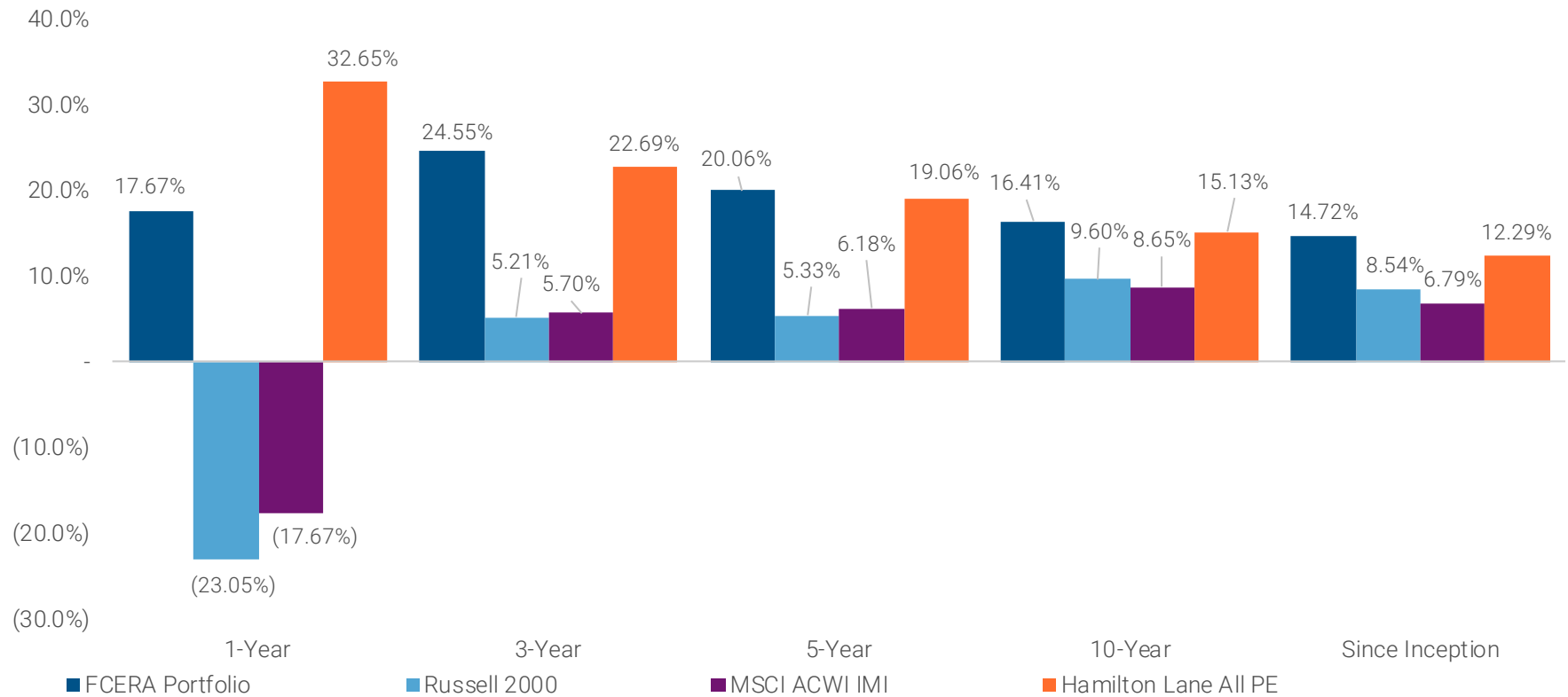
¹ The change in capital committed reflects the new commitments made during the period plus currency adjustments from exiting Non-USD denominated funds

² Portfolio Net IRR, net of General Partner fees and gross of Hamilton Lane fees

Note: Totals may not sum due to rounding

Portfolio IRR Performance vs. Benchmark

- 14.72% Since Inception Portfolio IRR outperformed the Russell 2000 benchmark by 618 bps
- 17.67% 1-Year IRR outperformed the Russell 2000 benchmark by 4081 bps



Time Horizon	FCERA Portfolio	Russell 2000	MSCI ACWI IMI	Hamilton Lane All PE
1-Year	17.67%	(23.05%)	(17.67%)	32.65%
3-Year	24.55%	5.21%	5.70%	22.69%
5-Year	20.06%	5.33%	6.18%	19.06%
10-Year	16.41%	9.60%	8.65%	15.13%
Since Inception	14.72%	8.54%	6.79%	12.29%

Note: The Russell 2000 and MSCI ACWI IMI benchmarks use a PME methodology while the Hamilton Lane All PE benchmark uses a straight-return methodology

Holdings Diversification

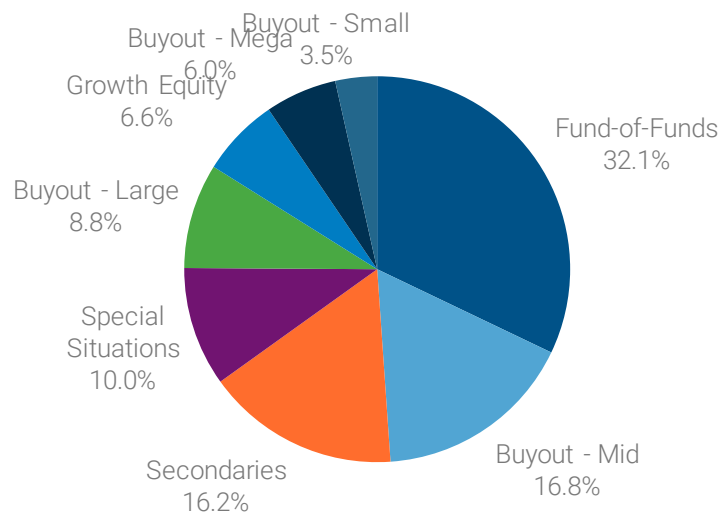
% of NAV

Strategy	3/31/2022	6/30/2022	Change in % Points
Fund-of-Funds	33.0%	32.1%	(0.9%)
Buyout - Mid	14.9%	16.8%	1.9%
Secondaries	17.4%	16.2%	(1.2%)
Special Situations	10.3%	10.0%	(0.3%)
Buyout - Large	8.4%	8.8%	0.4%
Growth Equity	6.8%	6.6%	(0.2%)
Buyout - Mega	6.2%	6.0%	(0.2%)
Buyout - Small	3.1%	3.5%	0.4%

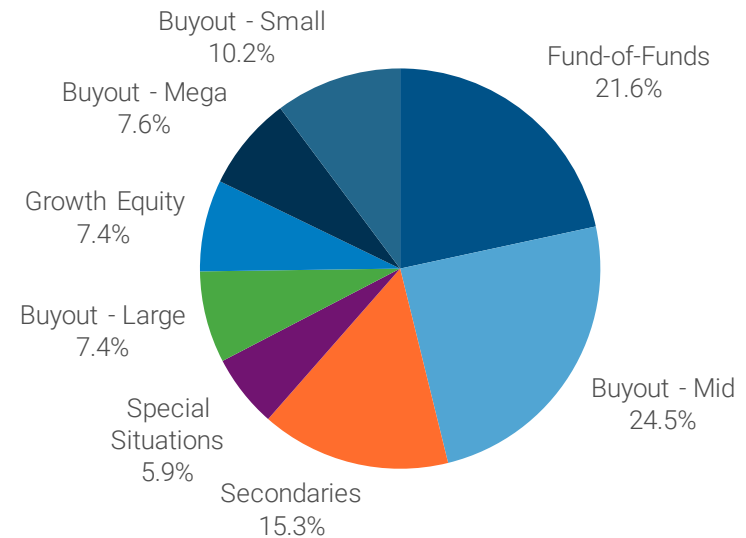
% of Total Exposure

Strategy	3/31/2022	6/30/2022	Change in % Points
Fund-of-Funds	23.9%	21.6%	(2.3%)
Buyout - Mid	24.1%	24.5%	0.4%
Secondaries	16.2%	15.3%	(0.9%)
Special Situations	6.6%	5.9%	(0.7%)
Buyout - Large	8.3%	7.4%	(0.9%)
Growth Equity	8.6%	7.4%	(1.2%)
Buyout - Mega	6.3%	7.6%	1.3%
Buyout - Small	5.9%	10.2%	4.3%

% of NAV



% of Total Exposure



Holdings Diversification

Industry Exposure by Exposed Market Value ¹

Sector	3/31/2022	6/30/2022	Change in % Points
FoF Holding	33.6%	31.6%	(2.0%)
Information Technology	16.7%	16.5%	(0.2%)
Financials	13.6%	13.5%	(0.1%)
Health Care	11.7%	11.1%	(0.6%)
Industrials	8.8%	9.1%	0.3%
Consumer Discretionary	5.8%	5.9%	0.1%
Communication Services	3.0%	3.8%	0.8%
Materials	3.4%	3.6%	0.2%
Consumer Staples	1.1%	1.9%	0.8%
Real Estate	1.6%	1.7%	0.1%
Energy	0.7%	0.8%	0.1%
Other Investments	0.1%	0.5%	0.4%
Utilities	0.1%	0.1%	-

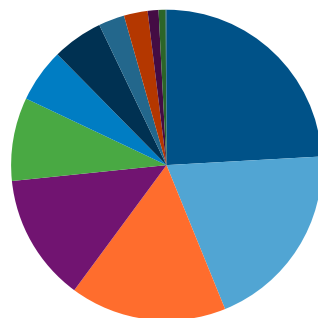
Geographic Exposure by Exposed Market Value ¹

Region	3/31/2022	6/30/2022	Change in % Points
North America	80.5%	80.2%	(0.2%)
Western Europe	9.7%	9.6%	(0.1%)
Asia	6.3%	6.6%	0.3%
Rest of World	3.6%	3.7%	0.1%

Public/Private Holdings by Exposed Market Value ¹

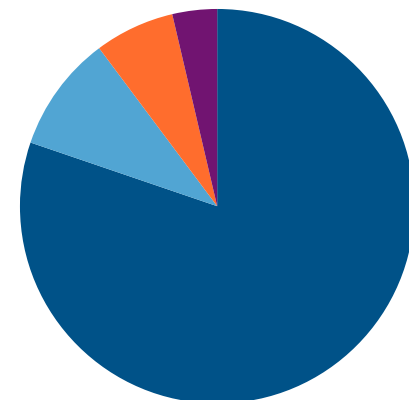
Public/Private	3/31/2022	6/30/2022	Change in % Points
Private	98.2%	98.3%	0.1%
Public	1.8%	1.7%	(0.1%)

Industry Exposure by Exposed Market Value



- Information Technology
- Industrials
- Materials
- Energy
- Financials
- Consumer Discretionary
- Consumer Staples
- Other Investments
- Health Care
- Communication Services
- Real Estate
- Utilities

Industry Exposure by Exposed Market Value



- North America
- Western Europe
- Asia
- Rest of World

¹ Exposed Market Value is LP's share of Market Value at the Portfolio Holding Level. May not sum to 100% due to rounding.

Definitions

Strategy Definitions

All Private Markets – Hamilton Lane’s definition of “All Private Markets” includes all private commingled funds excluding fund-of-funds, and secondary fund-of-funds.

Co/Direct Investment Funds – Any PM fund that primarily invests in deals alongside another financial sponsor that is leading the deal.

Continuation Vehicles – A vehicle in which secondary buyers acquire one or more assets from an existing fund.

Corporate Finance/Buyout – Any PM fund that generally takes control position by buying a company.

Credit – This strategy focuses on providing debt capital.

Distressed Debt – Includes any PM fund that primarily invests in the debt of distressed companies.

EU Buyout – Any buyout fund primarily investing in the European Union.

Fund-of-Funds (FoF) – A fund that manages a portfolio of investments in other private equity funds.

Growth Equity – Any PM fund that focuses on providing growth capital through an equity investment.

Infrastructure – An investment strategy that invests in physical systems involved in the distribution of people, goods, and resources.

Late Stage VC – A venture capital strategy that provides funding to developed startups.

Mega/Large Buyout – Any buyout fund larger than a certain fund size that depends on the vintage year.

Mezzanine – Includes any PM fund that primarily invests in the mezzanine debt of private companies.

Multi-Stage VC – A venture capital strategy that provides funding to startups across many investment stages.

Natural Resources – An investment strategy that invests in companies involved in the extraction, refinement, or distribution of natural resources.

Origination – Includes any PM fund that focuses primarily on providing debt capital directly to private companies, often using the company’s assets as collateral.

Private Equity – A broad term used to describe any fund that offers equity capital to private companies.

Real Assets – Real Assets includes any PM fund with a strategy of Infrastructure, Natural Resources, or Real Estate.

Real Estate – Any closed-end fund that primarily invests in non-core real estate, excluding separate accounts and joint ventures.

ROW – Any fund with a geographic focus outside of North America and Western Europe.

ROW Equity – Includes all buyout, growth, and venture capital-focused funds, with a geographic focus outside of North America and Western Europe.

Secondary FoF – A fund that purchases existing stakes in private equity funds on the secondary market.

Seed/Early VC – A venture capital strategy that provides funding to early-stage startups.

SMID Buyout – Any buyout fund smaller than a certain fund size, dependent on vintage year.

U.S. Mega/Large – Any buyout fund larger than a certain fund size that depends on the vintage year and is primarily investing in the United States.

U.S. SMID – Any buyout fund smaller than a certain fund size that depends on the vintage year and is primarily investing in the United States.

U.S. & EU Growth – Includes all growth equity funds investing in North America and Western Europe.

U.S. & EU VC – Includes all venture capital funds investing in North America and Western Europe.

VC/Growth – Includes all funds with a strategy of venture capital or growth equity.

Venture Capital – Venture Capital includes any PM fund focused on financing startups, early-stage, late stage, and emerging companies or a combination of multiple investment stages of startups.

Index Definitions

Barclays U.S. Corporate Aggregate Index – Tracks the performance of U.S. fixed rate corporate debt rated as investment grade.

BofAML High Yield Index – The BofAML High Yield index tracks the performance of below investment grade U.S. dollar-denominated corporate bonds publicly issued in the U.S. domestic market.

Credit Suisse High Yield Index – The Credit Suisse High Yield index tracks the performance of U.S. sub-investment grade bonds.

Credit Suisse Leveraged Loan Index – The CS Leveraged Loan Index represents tradable, senior-secured, U.S. dollar-denominated non-investment grade loans.

DJ Brookfield Global Infrastructure Index – The DJ Brookfield Global Infrastructure Index is designed to measure the performance of companies globally that are operators of pure-play infrastructure assets.

FTSE/NAREIT All Equity REIT Index – The FTSE/NAREIT All Equity REIT Index tracks the performance of U.S. equity REITs.

HFRI Composite Index – The HFRI Composite Index reflects hedge fund industry performance.

MSCI All Country World Index (ACWI) – The MSCI All Country World Index measures global stock market activity through the equity returns of 2,400 companies in 47 developed and emerging markets.

MSCI USA Small Cap Value Index – The MSCI USA Small Cap Index is designed to measure the performance of the small cap segment of the U.S. equity market.

MSCI World Energy Sector Index – The MSCI World Energy Sector Index measures the performance of securities classified in the GICS Energy sector.

MSCI World Index – The MSCI World Index tracks large and mid-cap equity performance in developed market countries.

Russell 3000 Index – The Russell 3000 Index is composed of 3000 large U.S. companies, as determined by market capitalization.

S&P 500 Index – The S&P 500 Index tracks 500 largest companies based on market capitalization of companies listed on NYSE or NASDAQ.

Other

Desmoothing – A mathematical process to remove serial autocorrelation in the return stream of assets that experience infrequent appraisal pricing, such as private equity. Desmoothed returns may more accurately capture volatility than reported returns. The formula used here for desmoothing is:

Where $rD(t)$ = the desmoothed return for period t , $r(t)$ = the return for period t , ρ = the autocorrelation

$$rD(t) = (r(t) - r(t-1) * \rho) / (1 - \rho)$$

PME (Public Market Equivalent) – Calculated by taking the fund cash flows and investing them in a relevant index. The fund cash flows are pooled such that capital calls are simulated as index share purchases and distributions as index share sales. Contributions are scaled by a factor such that the ending portfolio balance is equal to the private equity net asset value (equal ending exposures for both portfolios). This seeks to prevent shorting of the public market equivalent portfolio. Distributions are not scaled by this factor. The IRR is calculated based off of these adjusted cash flows.

Sharpe Ratio – The Sharpe Ratio is the average return earned in excess of the risk-free rate per unit of volatility or total risk.

Time-weighted Return – Time-weighted return is a measure of compound rate of growth in a portfolio.

Volatility – Volatility is a statistical measure of dispersion of return, specifically standard deviation.

Endnotes

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Please note that the data shown herein represents actual performance data for an investor who committed \$10M to the Hamilton Lane Carpenters Partnership Fund L.P. in 2000. The return figures shown may differ for investors who committed to the partnership at a different time or with different terms. The data shown is intended to provide information about the potential cash flows that a private equity fund can provide, and should not be considered a proxy for the performance of all private equity funds. Actual performance will vary depending on, amongst other factors, market and credit conditions and may vary significantly from the data shown herein. Past performance is not a guarantee of future results.

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- The projections published herein are based on a regression of quarterly public market index returns against quarterly private market index returns. This regression generates an alpha and a beta by strategy which can be used as inputs into the single-index model of pricing assets (Sharpe 1964, Lintner 1965). The formula for the single-index model is:
$$r_{Private\ Markets} = \alpha_{Private\ Markets} + \beta_{Private\ Markets}(r_{Public\ Markets} - r_{Risk\ Free}) + r_{Risk\ Free}$$
- Where:
$$r_{Private\ Markets} = \text{Return of the Private Markets}$$
$$r_{Public\ Markets} = \text{Return of the Public Markets}$$
$$\alpha_{Private\ Markets} = \text{Alpha of the Private Markets}$$
$$\beta_{Private\ Markets} = \text{Beta of the Private Markets}$$
$$r_{Risk\ Free} = \text{Risk Free Rate}$$
- The regression formulas for Core and Non-Core Real Estate differ slightly from the single-index model in that the regressions are multi-index models, which include multiple betas and public market returns to better predict private market returns, such as the U.S. Regression Indicator Index.
- Once all inputs are obtained, we create a 75% confidence interval for our expected returns. This should denote the inherent uncertainty in these sorts of predictions. In general, we expect to be accurate within a 400 basis point spread with 75% confidence in quarters of normal stock market volatility. During periods of outsized positive or negative returns in the public markets, we would expect to either be less accurate or for the confidence interval to expand meaningfully. We also expect individual portfolios to vary meaningfully from these projections, as individual portfolio returns vary from the industry's returns for many reasons, including concentration of assets, different investment pacing, and different strategy/geography makeups, to name a few. Larger and more mature portfolios should be expected to have a performance more similar to the market, and therefore more reflective of these estimates, than other portfolios might be.
- To estimate the next quarter's valuation for a portfolio, you can apply the estimated quarterly growth rate associated with it. The quarterly growth rate should be applied after adjusting for all fund contributions and distributions made during the quarter, in accordance with the Simple-Dietz methodology for calculating returns. Note that all calculations shown in the document are in USD. Therefore, the formula for calculating $r_{Private\ Markets}$ shown above yields a return in USD. To apply the $r_{Private\ Markets}$ to a portfolio with valuation and cash flow information already in USD, use the formula below:
$$Predicted\ NAV_{Ending} = (NAV_{Beginning})(1 + r_{Private\ Markets}) + ((1 + r_{Private\ Markets})/2)(Period\ Capital\ Calls - Period\ Distributions)$$
- If the portfolio valuation and cash flow information is not in USD OR you wish to convert a USD return to a non-USD currency, an "FX Effect" factor must be applied. The formula should be adjusted as shown below:
$$Predicted\ NAV_{Ending} = (NAV_{Beginning})(1 + r_{Private\ Markets} + FX\ Effect) + (1 + (r_{Private\ Markets} + FX\ Effect)/2)(Period\ Capital\ Calls - Period\ Distributions)$$

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Any tables, graphs or charts relating to past performance included in this report are intended only to illustrate the performance of the funds or the portfolio companies referred to for the historical periods shown. Such tables, graphs and charts are not intended to predict future performance and should not be used as the basis for an investment decision.

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