SFERS
San Francisco Employees' Retirement System

City and County of San Francisco
Employees' Retirement System

RETIREMENT BOARD CALENDAR SHEET
Retirement Board Meeting of July 10, 2019

To: Retirement Board

Through: Jay Huish
Executive Director

From: William J. Coaker, Jr., CFA, MBA
Chief Investment Officer

Date: July 10, 2019

Agenda Item:
Private Markets Portfolio Update

Background:
Cambridge Associates and TorreyCove Capital Partners will present an update of the Private Equity Portfolio for the year 2018. Given the reporting lag associated with private investment partnerships, all data will be presented as of December 31, 2018 unless otherwise noted.

As of December 31, 2018, SFERS' Private Equity portfolio has a market value of $4.9 billion, representing 20.3% of total pension assets. The program has generated a 15.9% net IRR since inception.

In 2018, the Private Equity team closed on $1.2 billion in commitments. Most of these investments are access-constrained.

Recommendation:
This item is for discussion only.

Attachments:
Reports from Cambridge Associates and TorreyCove Capital Partners

SAN FRANCISCO EMPLOYEES' RETIREMENT SYSTEM

PRIVATE EQUITY PORTFOLIO UPDATE

PRESENTED BY ANITA NG, INVESTMENT MANAGING DIRECTOR, AND KELLY JENSEN, INVESTMENT DIRECTOR

CAMBRIDGE ASSOCIATES

JULY 2019

CAMBRIDGE
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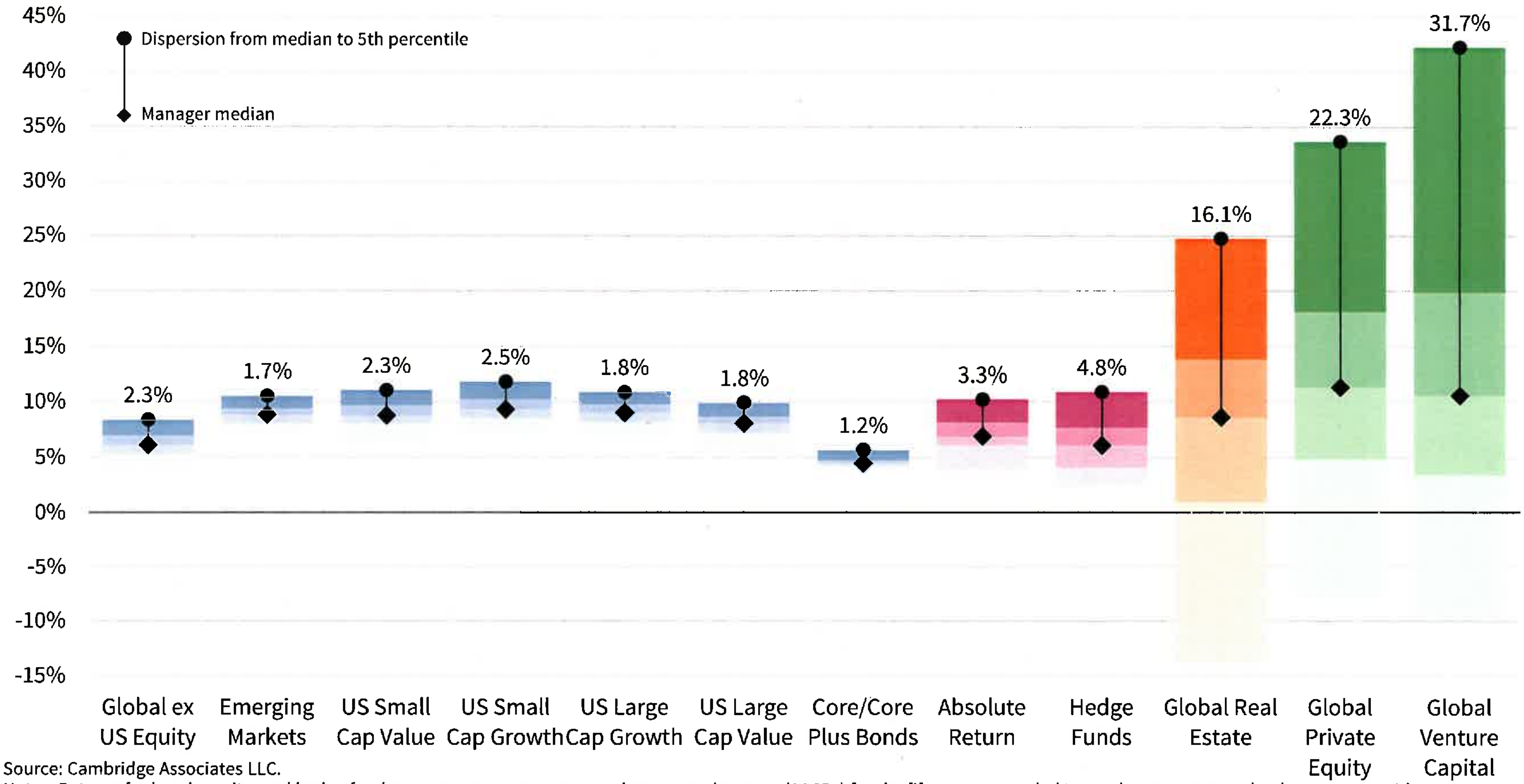
Introduction

- SFERS PE program continues to perform well on an absolute basis and relative to public markets. It has been a strong contributor to overall Plan returns over the short- and long-term.
- The PE program stands at roughly 20.0% of total Plan assets, slightly above the 18.0% target allocation, due primarily to strong outperformance over public markets in 2018. Cumulative distributions have amounted to $8.6 billion and have been robust over the past several years, particularly from buyout investments.
- 2018 was another productive year for the PE program:
  - $1,370 million in commitments to 26 managers – 17 existing relationships, 9 new.*
  - Record year of $796 million in distributions for the program, on the heels of prior year's peak and balanced across venture capital, growth capital and buyouts.
- The fundraising market remains very competitive for the most sought after funds. SFERS has benefitted from cultivating relationships with top-tier investment managers in advance of fundraising and continued to secure access to oversubscribed managers.
- Most private equity markets remain frothy. SFERS continues to focus on high conviction opportunities, emphasizing core relationships while establishing new ones where pockets of relative value and attractiveness are present.
- Commitments in recent years have intentionally focused on increasing exposure to Asia, growth capital, and sector-focused/mid-cap funds.

* Reflects commitments that were closed in 2018. Manager count reflects number of manager relationships. In some cases, SFERS has invested or coinvested across multiple strategies managed by the same firm.

If You Want Returns, Look to Alternative Strategies

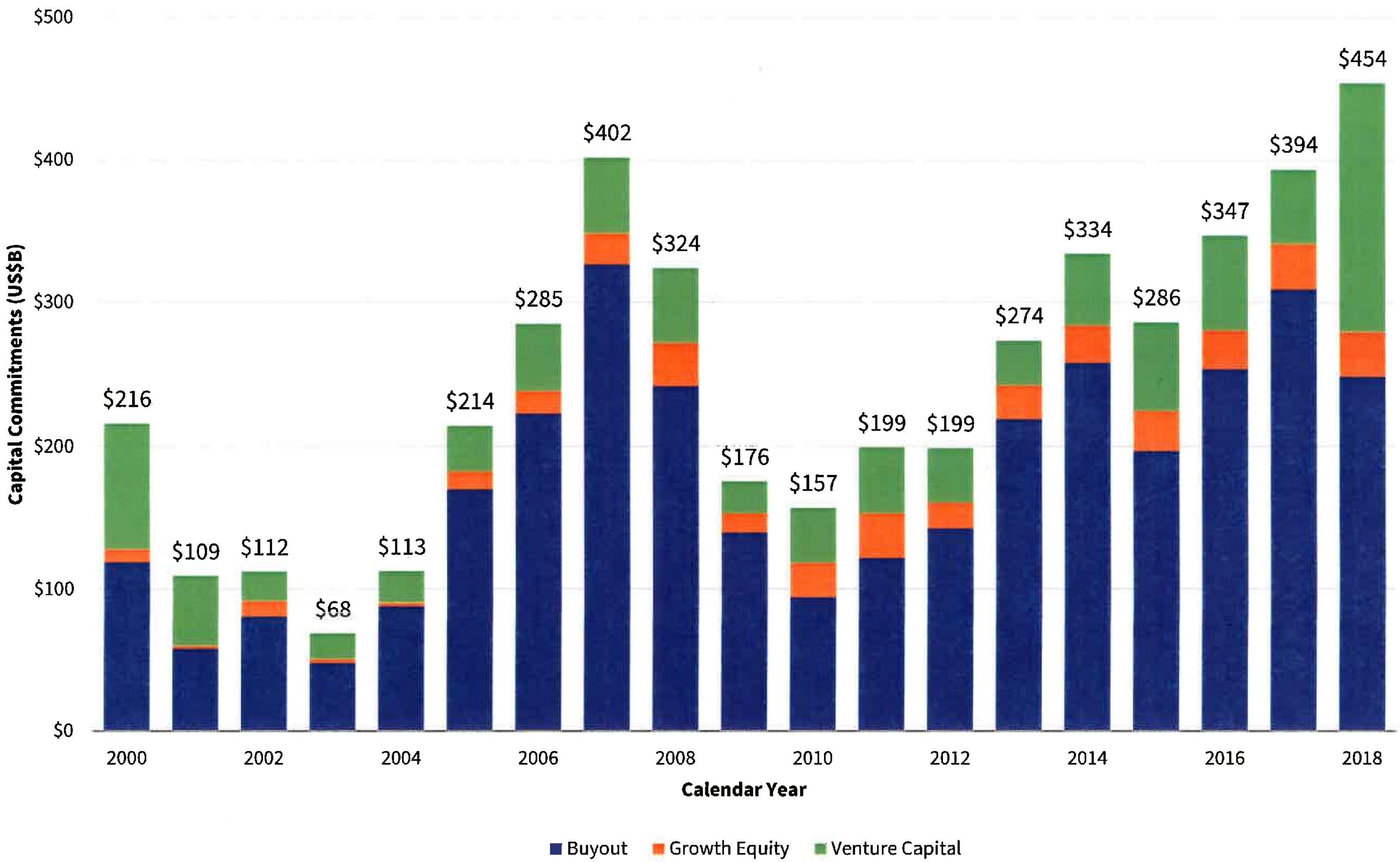
AVERAGE ANNUAL MANAGER RETURNS BY ASSET CLASS
Private Data: Inception to Date IRR for Vintage Years 2004-2015, as of September 30, 2018
Public Data: Public Market Returns from January 1, 2004 to December 31, 2018



Source: Cambridge Associates LLC.
Notes: Returns for bond, equity, and hedge fund managers are average annual compound returns (AACRs) for the fifteen years ended December 31, 2018, and only managers with performance available for the entire period are included. Returns for private investment managers are horizon internal rates of return (IRRs) calculated since inception to September 30, 2018. Time-weighted returns (AACRs) and money-weighted returns (IRRs) are not directly comparable. Cambridge Associates LLC's (CA) bond, equity, and hedge fund manager universe statistics are derived from CA's proprietary Investment Manager Database. Managers that do not report in US dollars, exclude cash reserves from reported total returns, or have less than $50 million in product assets are excluded. Performance of bond and public equity managers is generally reported gross of investment management fees. Hedge fund managers generally report performance net of investment management fees and performance fees. CA derives its private benchmarks from the financial information contained in its proprietary database of private investment funds. The pooled returns represent the net end-to-end rates of return calculated on the aggregate of all cash flows and market values as reported to Cambridge Associates by the funds' general partners in their quarterly and annual audited financial reports. These returns are net of management fees, expenses, and performance fees that take the form of a carried interest.

Global Fundraising Remains Robust

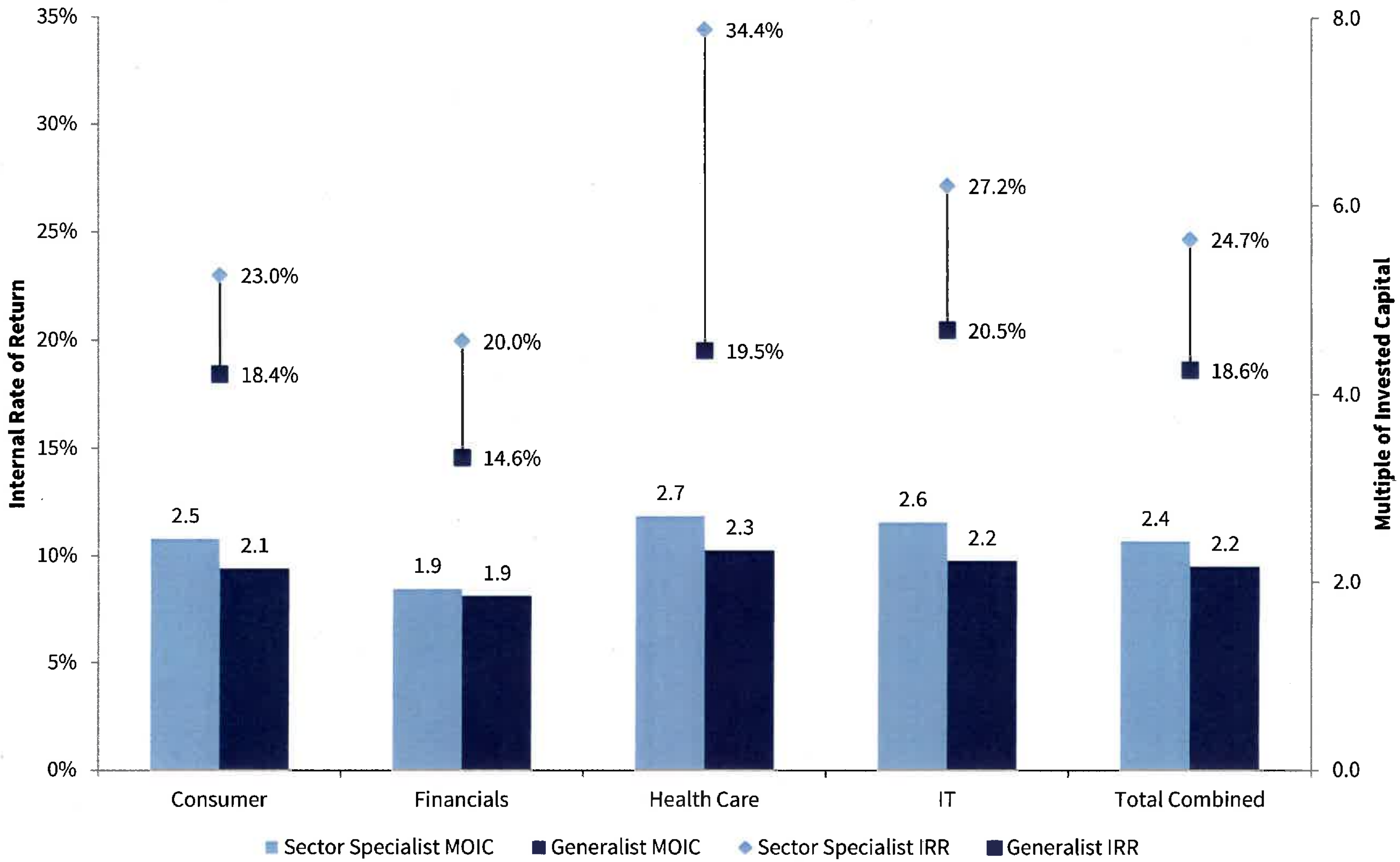
GLOBAL BUYOUT, VENTURE CAPITAL, AND GROWTH EQUITY TOTAL CAPITAL RAISED
As of December 31, 2018



Sources: Cambridge Associates LLC and PitchBook.
Notes: Data includes 4,806 buyout funds, 5,892 venture capital funds, and 1,407 growth equity funds raised between 2000 and 2018.

Sector Focused Funds Outperform

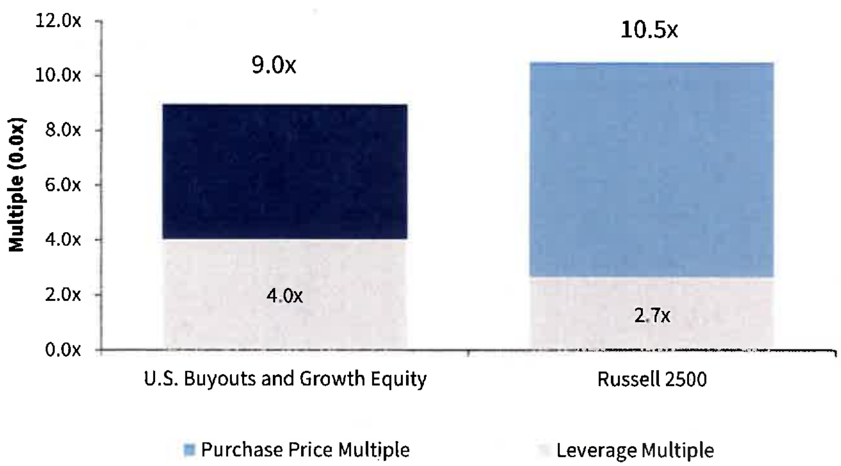
SPECIALIST VS. GENERALIST: SINCE INCEPTION GROSS RETURN AND TVPI
As of December 31, 2018



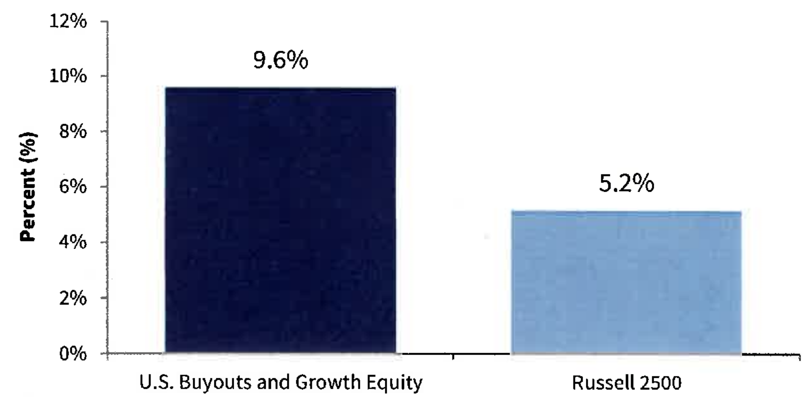
Source: Cambridge Associates LLC Private Investments Database.
Notes: Data represents realized and unrealized investments within the Cambridge Associates US Buyout and Growth Equity Benchmark initiated between 2001 and 2015. MOICs and IRRs are based on the aggregate performance of investments categorized as sector or generalist. All performance is gross of fees and expenses. Sectors represented include consumer, financials, health care, and technology.

Private Companies Best Their Public Counterparts in Many Ways, Thanks to Operator-Led PE

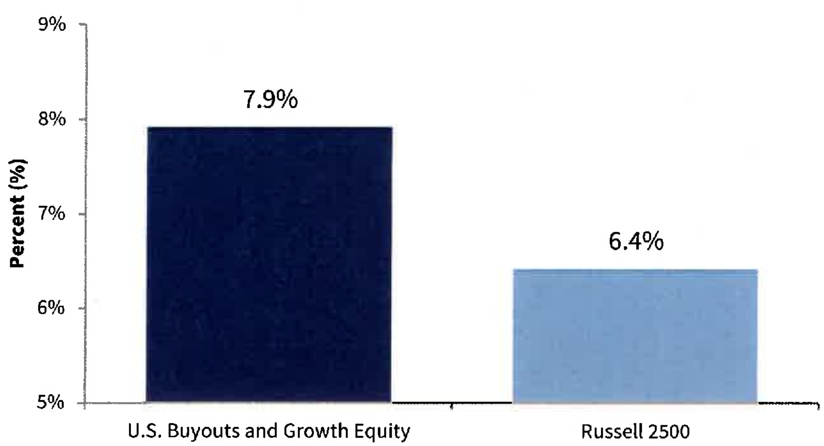
AVERAGE EBITDA PURCHASE PRICE AND LEVERAGE MULTIPLE
As of December 31, 2017



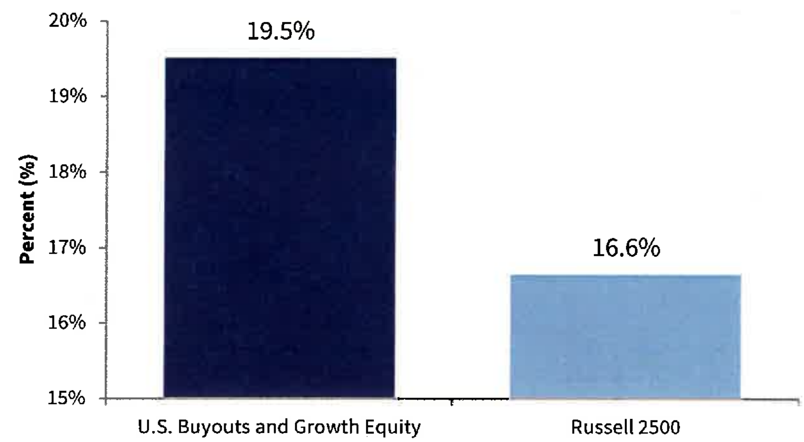
AVERAGE ANNUAL REVENUE GROWTH
As of December 31, 2017



AVERAGE ANNUAL EBITDA GROWTH
As of December 31, 2017



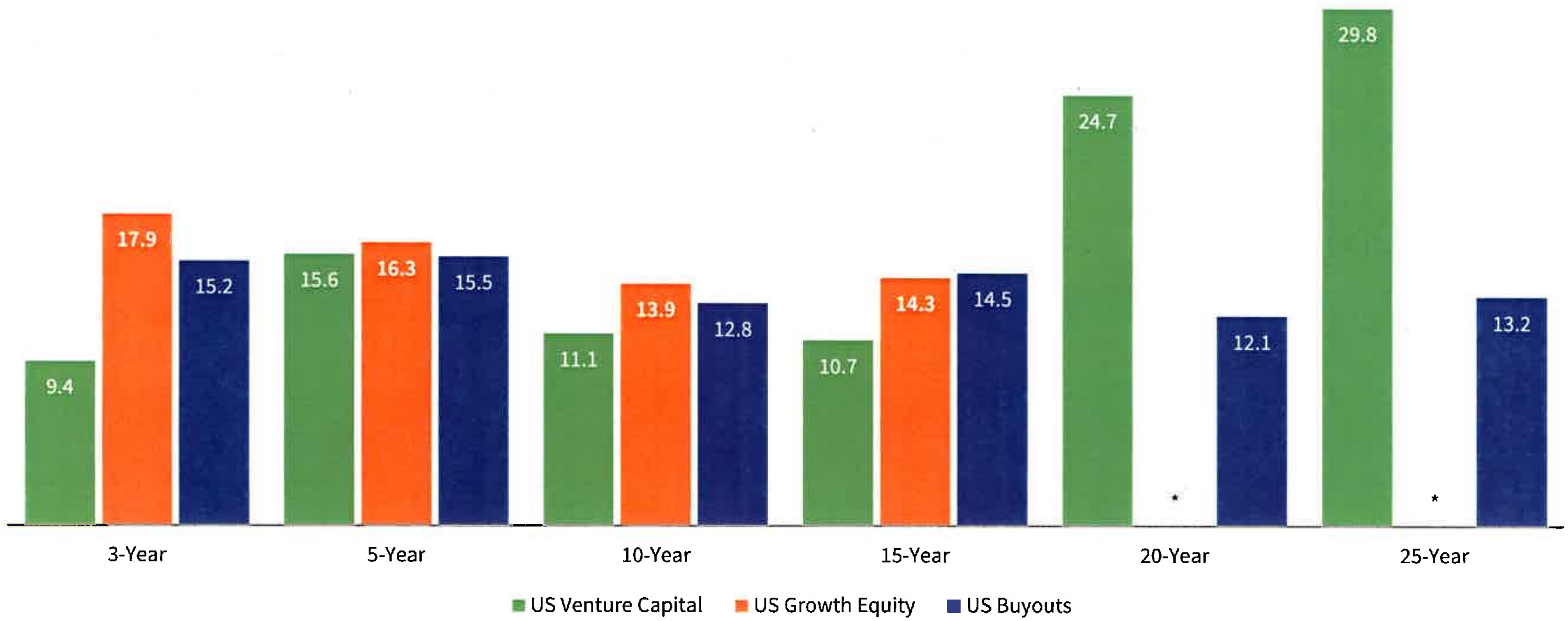
AVERAGE ANNUAL EBITDA MARGIN
As of December 31, 2017



Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers), FactSet Research Systems, and Frank Russell Company.
Notes: Outliers were identified and excluded, and the same methodology was applied to the PE and public company universes. Cambridge Associates collected information from PE firms of all sizes with broad mandates, as well as specialized and industry-focused strategies. The universe includes more than 1,800 U.S. investments made by PE firms and is subject to change over time. Purchase price and leverage multiples are from 2003 to 2017 and annual averages are from 2007 to 2017. The companies in the universe range in enterprise value from less than $1 million to larger than $60 billion.

Growth Equity's Compelling Return Profile

PERIODIC RATES OF RETURN (%)
As of September 30, 2018



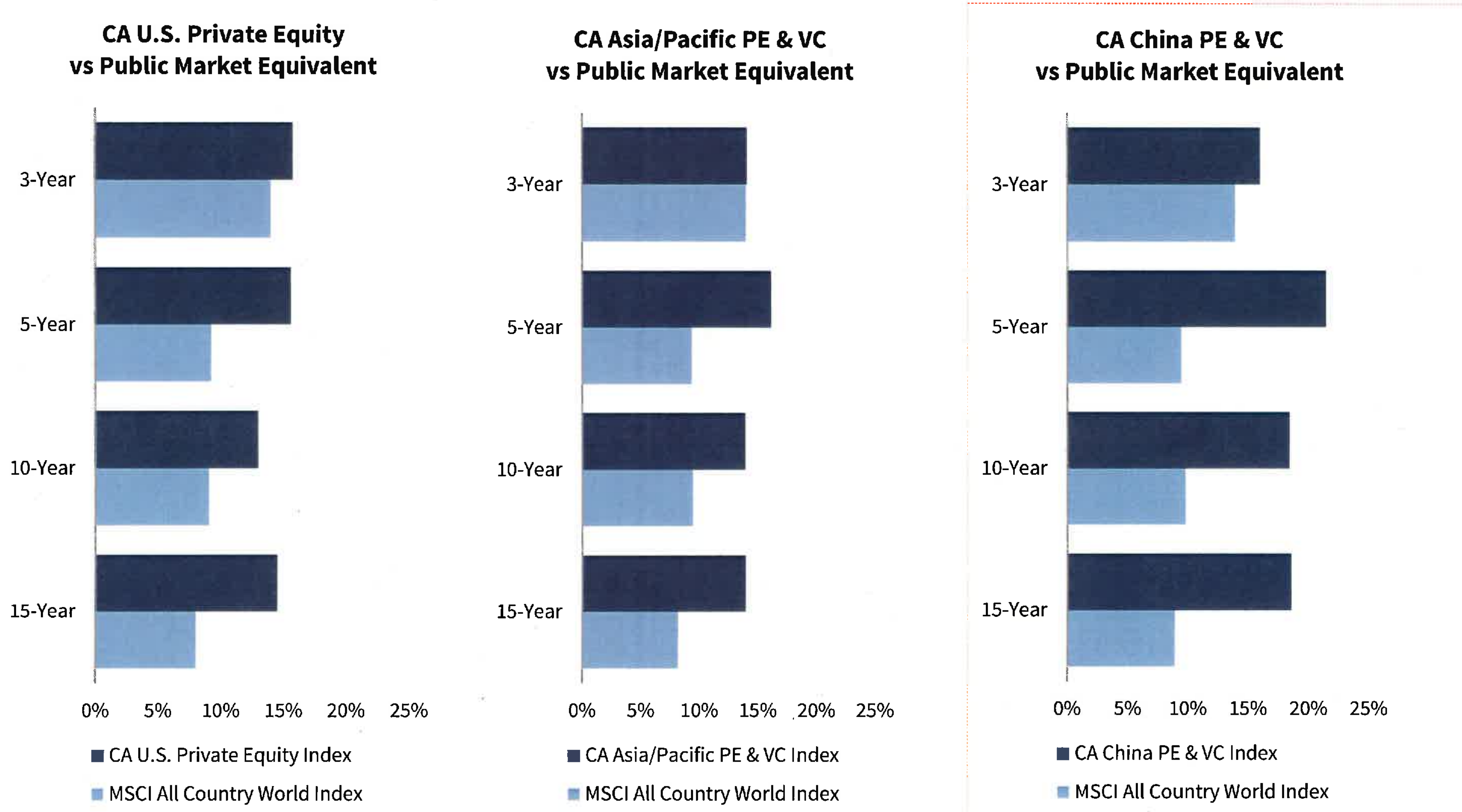
AGGREGATE CAPITAL LOSS RATIOS
As of September 30, 2018

	US VENTURE CAPITAL	US GROWTH EQUITY	US BUYOUTS
Impairment Ratio	51.3%	**29.1%**	27.4%
Capital Loss Ratio	33.0%	**13.9%**	11.8%

Sources: Cambridge Associates LLC Private Investments Database (as reported by investment managers), FactSet Research Systems, and Frank Russell Company.
Notes: Periodic rates of return analysis includes 256 US growth equity funds, 849 US buyout funds, and 1,806 US venture capital funds. Periodic asset class returns are pooled returns for each asset class, net to LPs. *The growth equity sample is too limited for 20- and 25-year analysis. Aggregate capital loss ratio analysis includes 4,248 growth equity investments, 36,274 venture capital investments, and 9,241 leveraged buyout investments made between 1990 and 2016. Growth equity deals are those completed by firms classified by Cambridge Associates as pursuing a growth equity investment strategy. Capital loss ratio is defined as the percentage of capital in deals realized below cost, net of any recovered proceeds, over total invested capital.

Strong PE/VC Performance vs. Public Market by Region, as of Sept 30, 2018

Performance of the Asia PE/VC benchmark has been in line with USPE, outperforming public markets by ~400 bps. Chinese PE/VC has outperformed by more than 800 bps



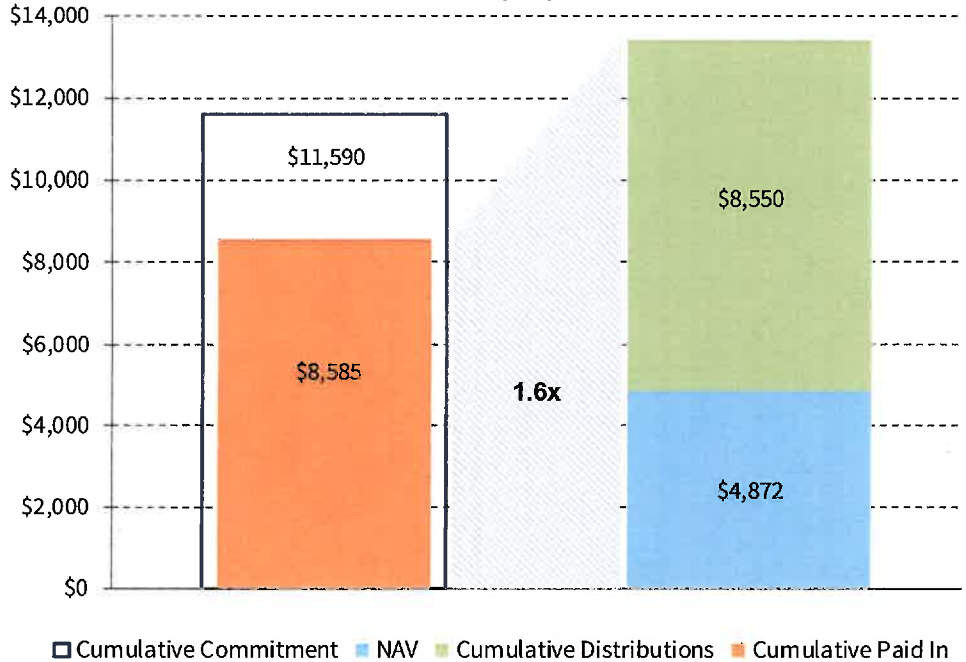
Source: Cambridge Associates LLC Private Investments Database, and MSCI, Inc. MSCI data provided "as is" without any express or implied warranties.
Notes: All private returns are pooled end-to-end calculations net of fees of private equity (buyouts and growth equity) and venture capital funds, including fully liquidated partnerships. U.S. Private Equity is represented by 1,096 funds formed between 1988 and 2018. Asia/Pacific PE & VC is represented by 548 Asia/Pacific funds formed between 1989 and 2018. China PE & VC is represented by 195 China funds formed between 1993 and 2018.

Program Snapshot

As of December 31, 2018

- Since inception in 1987 through December 31, 2018, SFERS has committed $11.6 billion to 379 funds. SFERS investment managers have called $8.6 billion, or 74.0% of total commitments.
- The portfolio has a total value to paid-in multiple of 1.6x, generating $4.8 billion in value creation (net of fees and carried interest).
- Current portfolio NAV stands at $4.9 billion, or 20.3% of total Plan assets. Unfunded commitments of $3.4 billion will be contributed to the portfolio over a period of several years (and offset by portfolio distributions).

Private Equity Program
As of 12/31/18

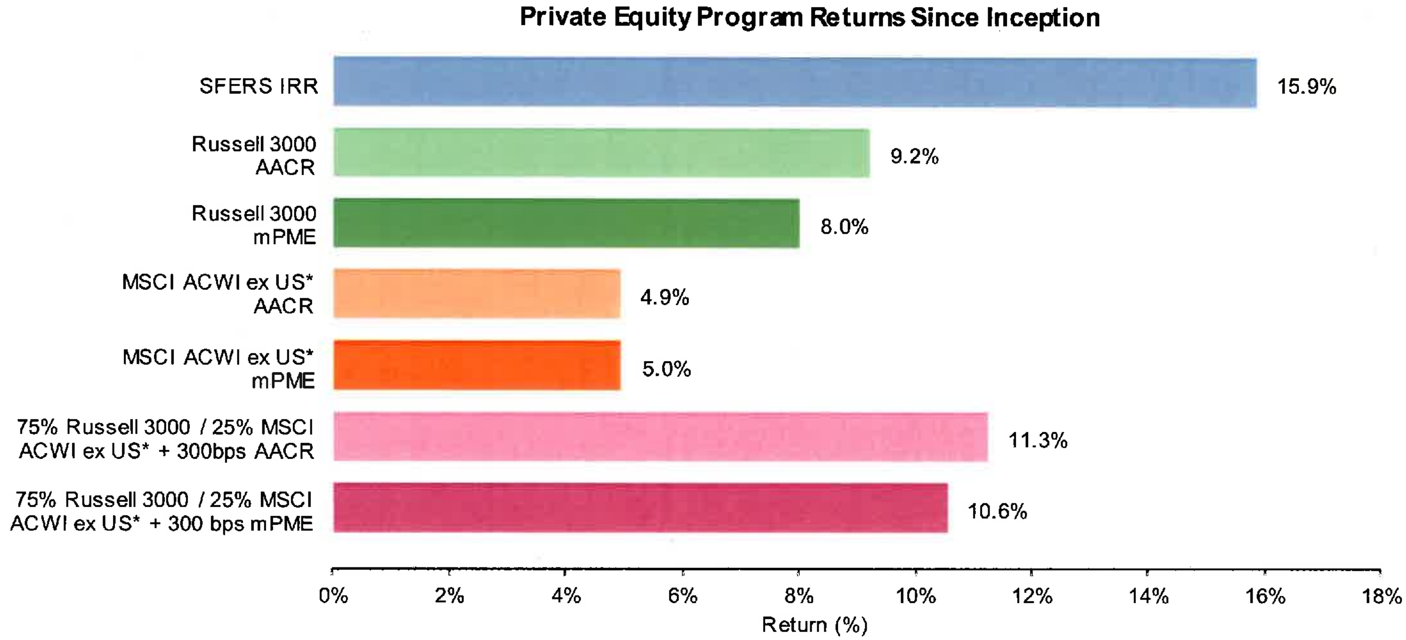


Note: Commitments made subsequent to December 31, 2018 are not included. Figures provided by Torrey Cove. Unfunded commitments do not tie to cumulative commitments minus cumulative paid-in due to recallable distributions and currency conversion.

Program Performance

As of December 31, 2018

- SFERS PE program has performed well in comparison to both public markets and peers.
- PE portfolio has generated a 15.9% net IRR since inception in 1987, outperforming the blended mPME benchmark (75% Russell 3000 / 25% MSCI ACWI ex US + 300 bps) by 530 bps.



SFERS consistently ranks in the top ten of public pension PE returns. According to InvestorForce, **SFERS' ten-year PE return was more than 250 basis points higher than the median and placed SFERS in 8th place amongst public pension plans with greater than $1 billion of assets.**

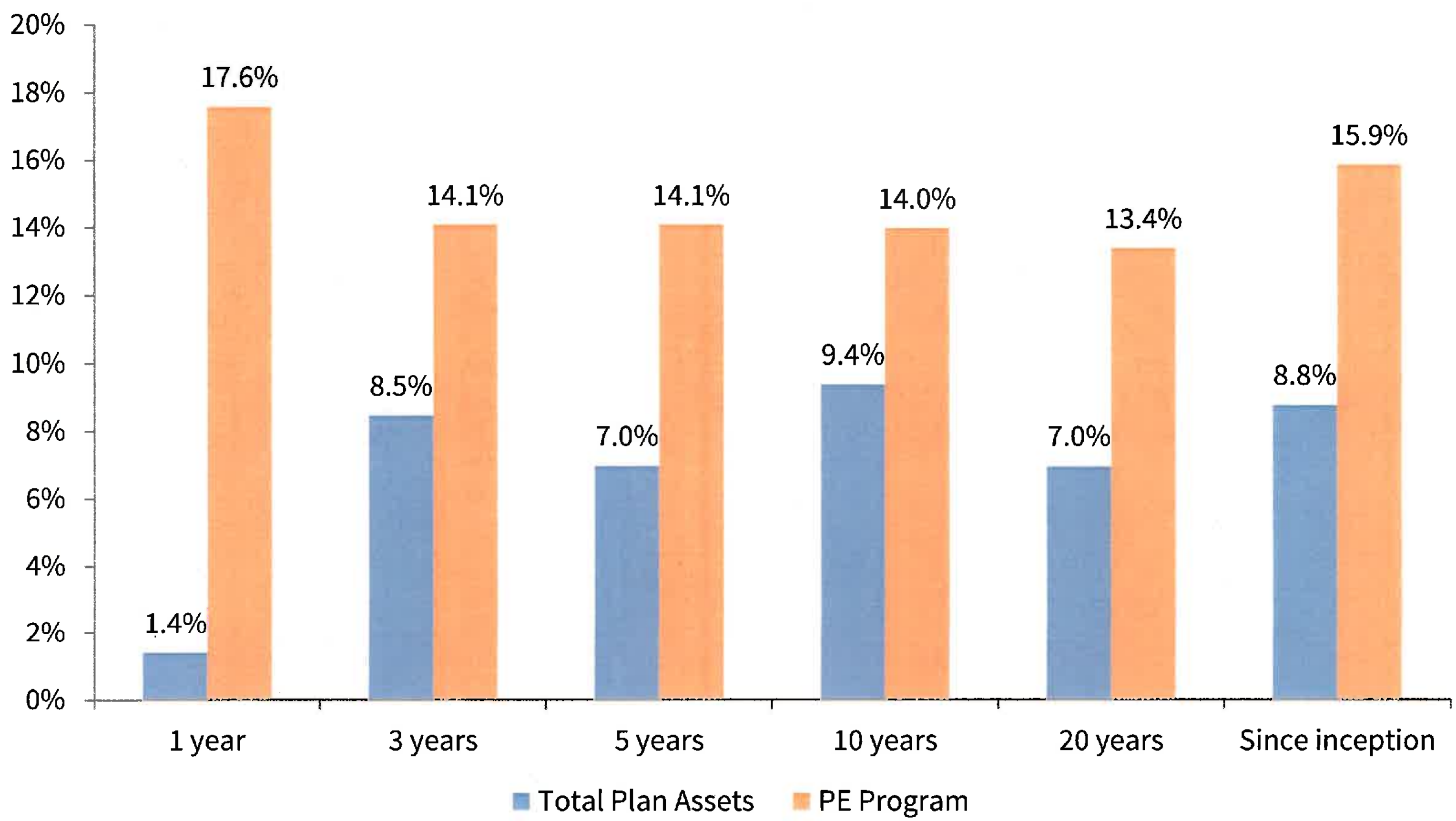
Note: SFERS performance data reported by Torrey Cove and as of 12/31/2018. The mPME methodology attempts to create a dollar-weighted return measure using quarterly returns on public indices for direct comparison to the internal rate of return (IRR) used to measure private investments performance. The methodology assumes that inflows to the modified Public Market Equivalent ("mPME") are equivalent in size and timing to contributions to the private portfolio. Distributions, on the other hand, are assumed to occur at the same time as in the private portfolio, but instead of at the same size, they are assumed to be of the same proportion to the NAV of the PME as the distributions in the private portfolio are to its NAV. NAV, meanwhile is grown at the rate of return of the public index. This figure was calculated using Torrey Cove historical cash flow data. Pension fund PE returns ranking is according to the NEPC performance summary presented at the March 13, 2019 SFERS board meeting. The InvestorForce Public DB > $1 Billion net of fee universe contains 64 observations.

*MSCI ACWI ex US represents MSCI ACWI ex US (net) returns from 12/31/2018 back through 3/31/2001, backfilled with MSCI ACWI ex US (gross) returns through 3/31/1988, and MSCI World ex US (net) returns through 12/31/1987.

Program Performance (cont'd)

As of December 31, 2018

- SFERS PE program continues to add significant value to overall plan returns, achieving a 17.6% IRR during 2018.

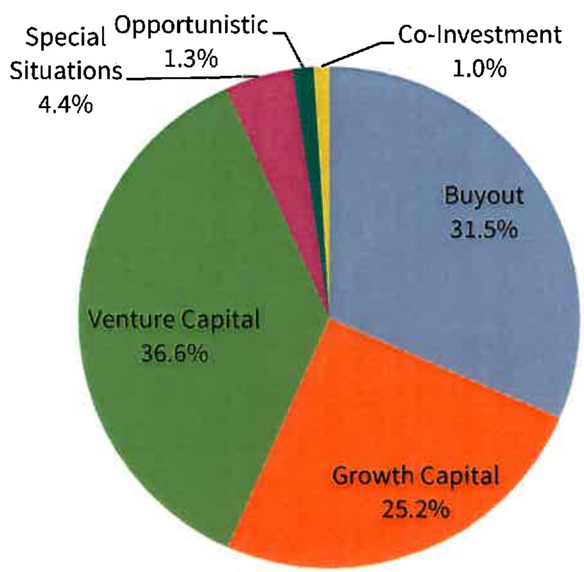


Note(s): All PE program returns are provided by Torrey Cove and are as of 12/31/2018. Total Plan Assets returns are provided by NEPC and are as of 12/31/2018.

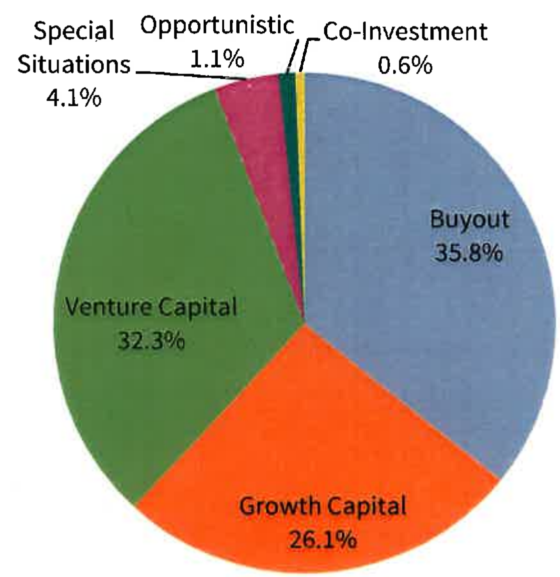
Portfolio Construction

As of December 31, 2018

EXPOSURE BY NAV
$4,872 million



EXPOSURE BY NAV + UNFUNDED
$8,238 million



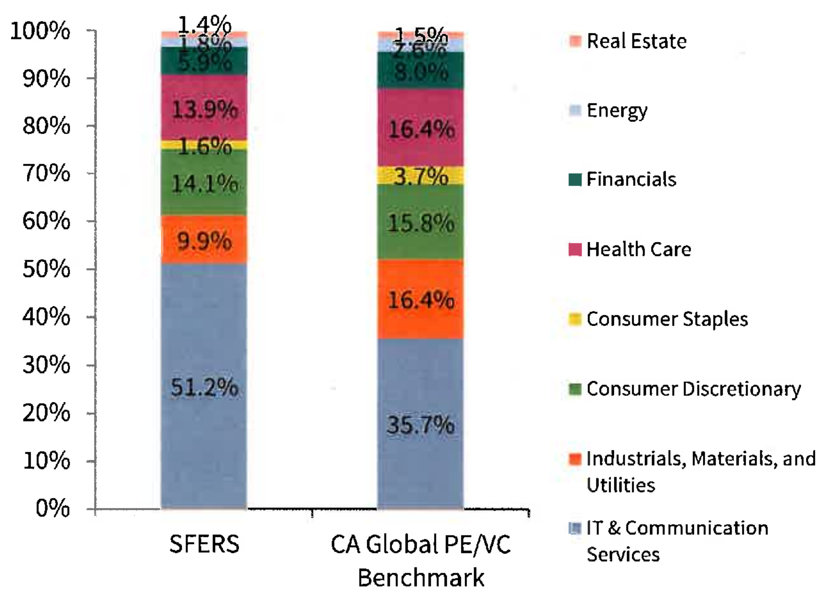
- Disproportional NAV growth within Venture & Growth Capital (along with strong distribution activity in Buyouts) driving increase in exposure.
- "In the ground" exposure likely to tilt toward Buyouts in coming years given uncalled commitments.

Note: Exposure data reported by Torrey Cove and is as of 12/31/2018. Asset class exposures reported at the fund level. Commitments made subsequent to December 31, 2018 are not included.

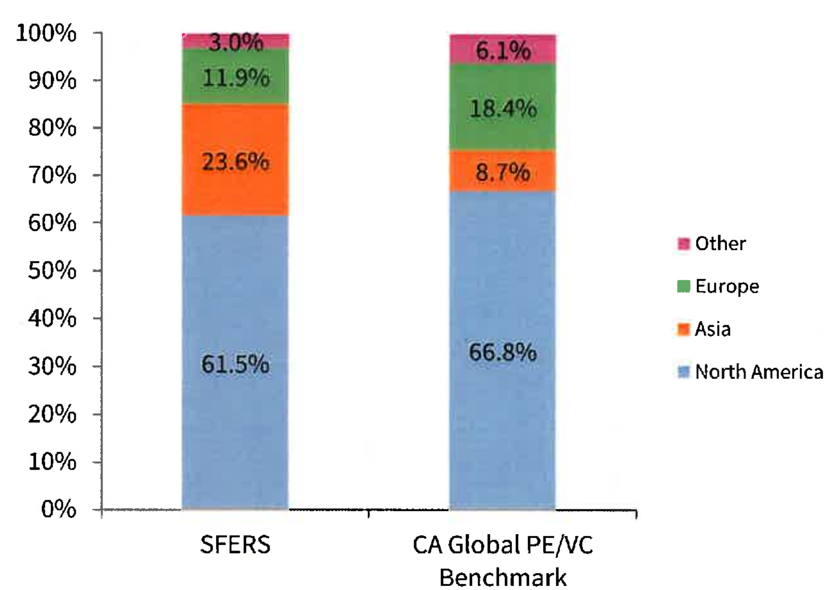
Company Level Exposure

As of December 31, 2018

SECTOR EXPOSURE



GEOGRAPHIC EXPOSURE



- Deliberate overweight to the technology sector.
- Modest underweights to the industrial, consumer, and health care sectors, current areas of focus.
- Intentional overweight to Asia. SFERS' growth in exposure to the region is driven by strong performance within the region and targeted commitments in recent years. Relative underweight to Europe, where SFERS' portfolio is mature; SFERS continues to look for differentiated and complementary exposure in the current competitive market environment.

Note: Exposure based on NAV and reflects all SFERS' PE asset classes excluding fixed income. SFERS exposure data is reported by Torrey Cove and as of 12/31/2018. Analysis excludes some investments in which exposure is unknown or not provided by the General Partner. CA benchmark exposures are based on the aggregate CA Global Private Equity and Venture Capital Benchmark NAV and are as of 12/31/2018. Private Equity Energy Funds were removed from the CA Global Private Equity and Venture Capital Benchmark in the above sector & geographic breakdown analysis. Sector exposures for the benchmark reflect investment level reporting. Approx. 77% of funds included in the CA Benchmark reported investment level data. Geographic exposures for the benchmark reflect fund level reporting. "Other" Geographic exposures for the benchmark include the Middle East, Latin America, Africa, and funds CA categorizes as Global. "Other" geographic exposures for SFERS include the Middle East, Latin America, and Africa.

Market / Portfolio Observations

- Buyouts
  - SFERS buyout program has been the largest driver of value creation for the PE program since inception. Recent performance has been strong as well, with SFERS' 5-year and 3-year net IRRs at 13.1% and 14.6 %, respectively. Distributions from buyout managers totaled $357 million, a peak in the program's history. This represents 44.8% of total PE program distributions in 2018.
  - In 2018, SFERS continued to focus on small- and mid-cap managers, where the landscape is more fragmented and less efficient, and strong sector-focused managers, which have shown a better risk/return profile compared to generalist firms trafficking in their sectors.
    - The portfolio currently has good exposure to the technology sector and continues to add to other sectors, such as last year's commitments to two consumer-focused managers.
  - SFERS continues to make progress in consolidating its large/mega-cap manager line up, selectively re-upping with high-conviction core managers.
  - Within Europe, favor middle-market regionally- and country-focused funds with established sector and operational expertise.
  - Within Asia, small- and mid-cap developed market buyouts continue to be attractive given the limited competition, reasonable valuations, prudent use of leverage, and strong exit markets.
    - In particular, we find the Japanese small-/mid-cap buyout space attractive given an increase in the number of opportunities due to regulatory and social structural changes.
  - Within emerging markets, SFERS established a relationship with a middle-market buyout manager who invests primarily in Brazil. Selectively build out exposure through experienced GPs with sector expertise and the flexibility to invest across geographies and sectors based on relative attractiveness.

Market / Portfolio Observations (Continued)

- Venture Capital
  - SFERS venture capital program has been a strong driver of performance (since inception net IRR of 21.8%). Recent performance has been particularly impressive, delivering a 1-year net IRR of 22.7%. Distributions from venture capital managers totaled $179 million in 2018.
  - In the US, later-stage valuations remain high while earlier-stage companies are more reasonably valued. Annual capital invested into US VC eclipsed $100 billion for the first time since the dot com era. Exit activity in 2018 was robust, though concentrated in a few larger exits such as Spotify, Dropbox, Docusign, and Github.
  - In the last year, SFERS maintained exposure with a number of high-conviction, core US managers and established a relationship with an emerging manager focused on real estate-related technology. SFERS will continue to emphasize enhancing the early-stage portfolio.
  - Within Asia, continue to favor early-stage venture opportunities in China.
    - Look for opportunities over time to upgrade maturing tech VC firms and add complementary sector specialists, such as 2018 commitment to an early-stage healthcare and consumer services focused manager.
  - Look to selectively add European venture where it may be complementary and additive through regional or country-focused managers who can provide differentiated exposure in the current competitive market environment.

Market / Portfolio Observations (Continued)

- Growth Capital
  - SFERS remains relatively underweight in growth capital, but has made good progress in establishing new growth capital manager relationships globally in the last several years.
  - SFERS' since inception returns for growth capital (11.9% net IRR) have not been as strong as other sub-strategies, but recent momentum has picked up and growth capital generated strong 3- and 5-year returns (20.0% and 16.9% net IRRs, respectively). Distributions reached a peak of $179 million in 2018.
  - In 2018, SFERS committed $320 million to five US and China–focused growth equity managers that can take advantage of growth opportunities around the world.
    - Includes commitments to two new managers.
  - Valuations and competition remain high for most growth-stage companies, especially those that do not need capital.
  - The growth capital sector is bifurcated – many established managers have moved upmarket while new groups, with limited track records are popping up. Additionally, venture capital managers are raising "opportunity" funds to avoid ownership dilution and capture more of the economics by investing during the later stages of a company's life cycle.
  - Look to add high conviction emerging groups targeting the less competitive lower end of the market, and those with differentiated sector and operating expertise, sourcing capabilities, and networks.

Market / Portfolio Observations (Continued)

- Special Situations
  - SFERS has benefitted from managers that take advantage of market dislocations and should continue to look for these opportunities.
  - Should be prepared to increase commitments to this sector should a serious dislocation occur.
- Emerging Markets
  - SFERS has made meaningful strides over the years in increasing its exposure to emerging markets, specifically emerging Asia and Latin America.
  - The landscape for institutional quality managers continues to improve, and the long-term growth potential of emerging markets remains attractive.
  - In the medium-term, general weakness in EM currencies and public markets volatility could dampen returns, especially in Dollar terms.
  - Continue to pursue managers who have a local presence and sector expertise, and who focus on operational value-add and structure downside protection.
  - Remain focused on team stability when assessing emerging markets managers.

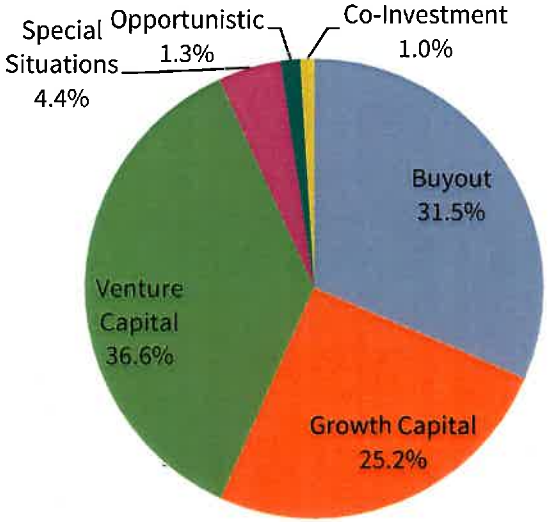
Market / Portfolio Observations (Continued)

- Co-Investments
  - Co-investments continue to offer SFERS the opportunity to enhance returns, reduce economic leakage to GPs, and target select sector and geographic exposure.
  - SFERS PE program has committed $189 million across twelve co-investments from 2014 through YTD 2019.
  - Exposure is diversified by manager, investment type and geography.
  - The Private Equity co-investments were marked at a net 1.3 MOIC and 15.9% IRR as of 12/31/2018.
  - All co-investments have been with managers SFERS has an established relationship with and have met the criteria and standards established by SFERS.
  - SFERS is seeing robust Private Equity co-investment deal flow and reviewed a number of opportunities in 2018. However, it remains highly disciplined and selective in the opportunities it pursues.

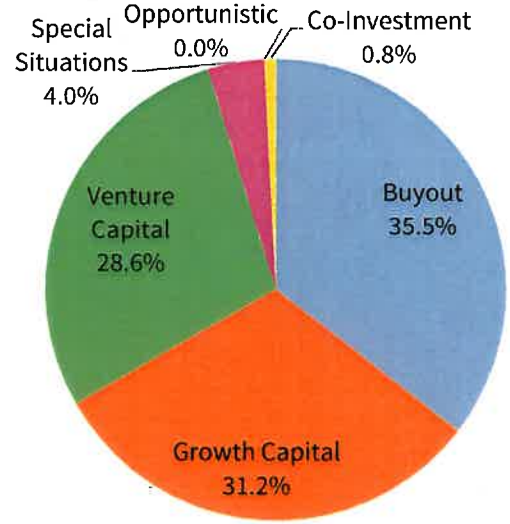
Five-Year Commitment Snapshot

Continued balance within buyout, growth, and venture exposure with an increased emphasis on Asia over the last five years

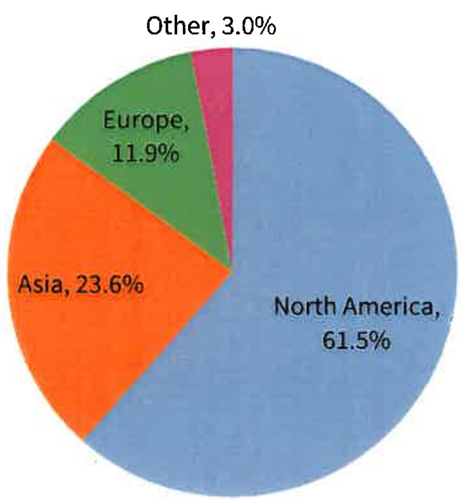
CURRENT NAV BY SUB-STRATEGY



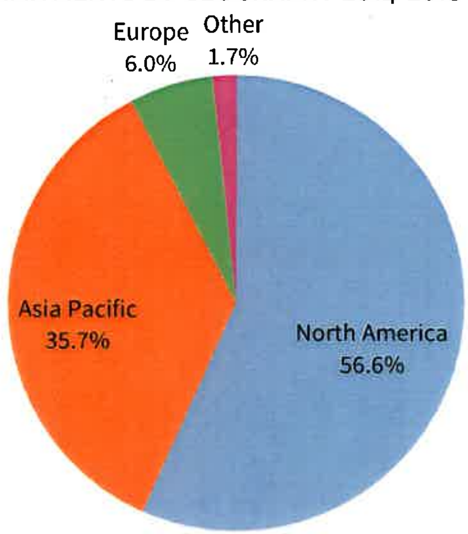
COMMITMENTS BY SUB-STRATEGY 2014-2018



CURRENT NAV BY GEOGRAPHY



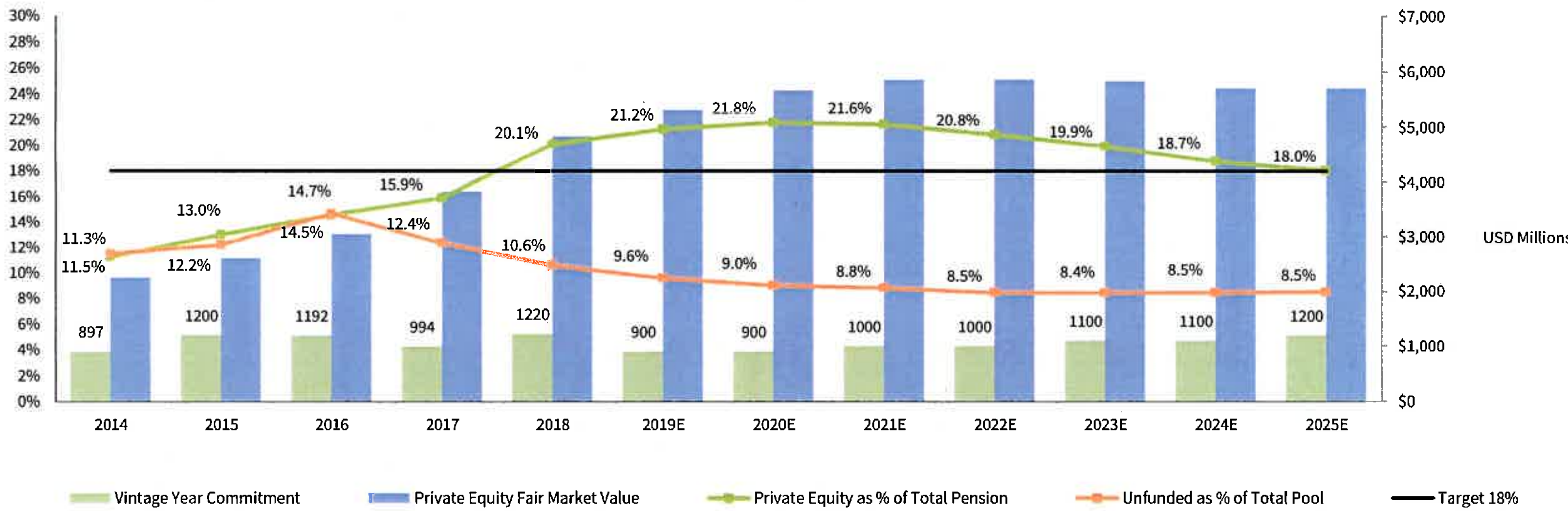
COMMITMENTS BY GEOGRAPHY 2014-2018

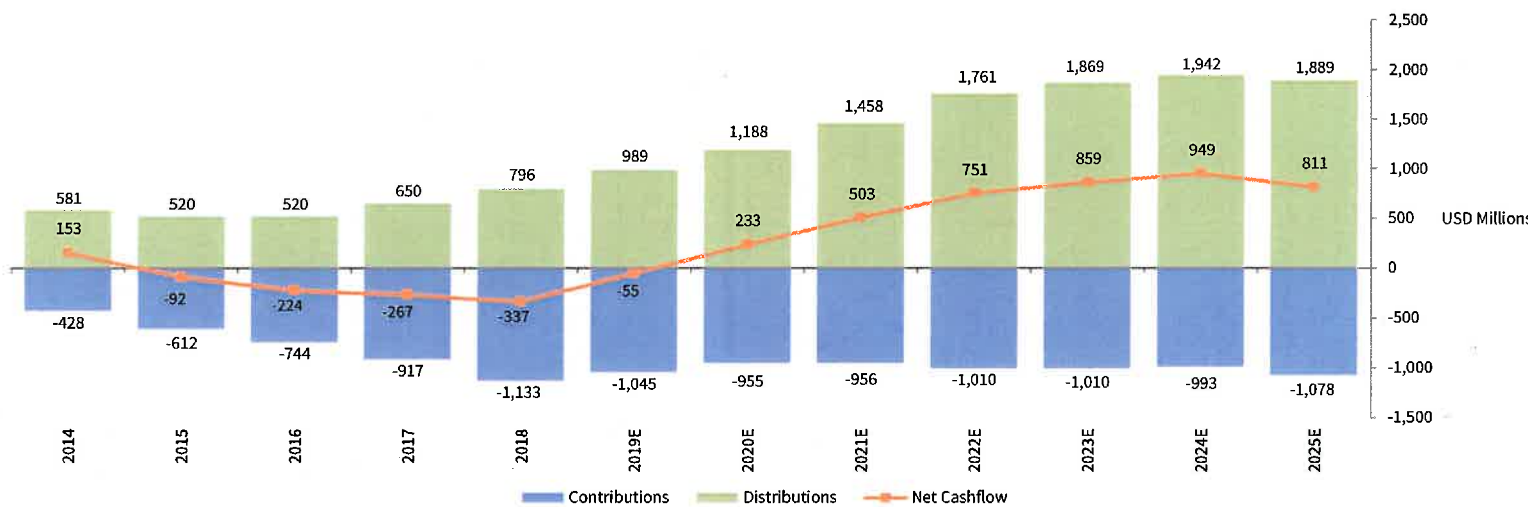


Note: NAV strategy exposure data is provided by Torrey Cove, reported at the fund-level as of 12/31/2018. NAV geographic exposure data is provided by Torrey Cove, reported at the investment level as of 12/31/2018. Both 2014-2018 commitment pie charts use data provided by SFERS and Cambridge Associates, and are bucketed according to Cambridge Associates classifications. Commitments made subsequent to December 31, 2018 are not included. "Other" Geographic exposures include Middle East , Latin America and Africa.

C|A Commitment Pacing and Portfolio Allocation Estimate

For Illustrative Purposes





Note: Graph estimates future allocations and cash flows based on C|A models. These models are intended to be used as guidelines; actual capital calls, distributions, and exposure may differ from projections based off of macroeconomic and fun-specific variables. Model uses 12/31/18 pool value of $24.1B and assumed annual overall pool growth of 4%.

APPENDIX

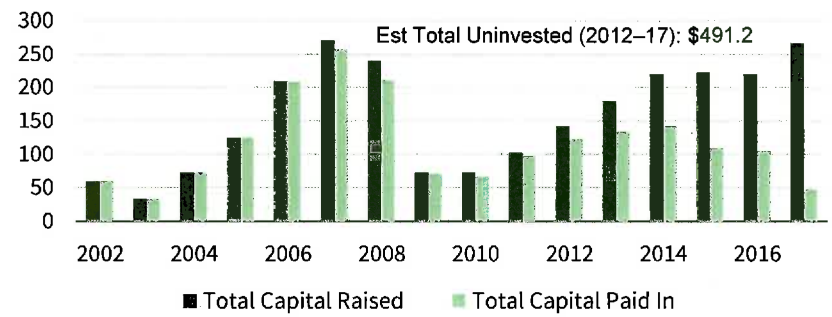
US Private Equity

Facts & Figures

- Following a year of near-record fundraising, boosted by funds of all sizes, 2018 has seen its fair share of mega and large funds close, but mid-market funds appear to be behind their 2017 level (*Buyouts* magazine). Significant fundraising in the mega-cap space will add to the already sizable capital overhang, but could represent exit opportunities for smaller-sized companies.
- Amid an active market, average purchase price multiples for mid-sized companies (enterprise values between $250 mm and $499 mm), during first half 2018, were at similar levels to 2017 (8.3x EBITDA), which were lower than those in 2016 (9.0x).
- After hitting historic heights in 2017 (with an average of 10.9x EBITDA), large company valuations fell slightly during first half 2018 (10.2x).
- In first half 2018, leverage multiples for middle-market (< $50 mm EBITDA) and large companies remained at roughly the same level as in 2017, reaching 5.4x EBITDA and 5.7x EBITDA, respectively.
- In 2017, average equity contributions for middle-market companies were at their highest levels since 2009 at 47.3%; in the first six months of 2018, contributions were closer to 41%.
- PE-backed exits in first half 2018 appear to put the year on track to be behind the previous four years. It is likely that markets have been and will continue to be impacted by geopolitical factors, including regulatory and general market uncertainty.
- As of June 30, 2018, on an mPME basis, US private equity (as defined by the buyout and growth equity managers in the Cambridge Associates LLC US Private Equity Index®) outperformed the indexes tracking both large and small public companies over short-, medium-, and long-term time periods.

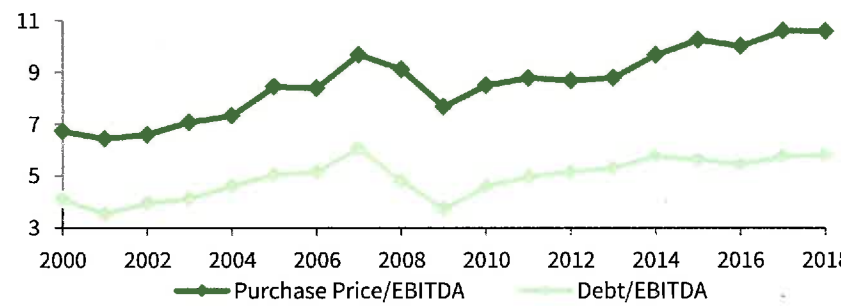
US PRIVATE EQUITY ESTIMATED OVERHANG

2002–17 • US$B



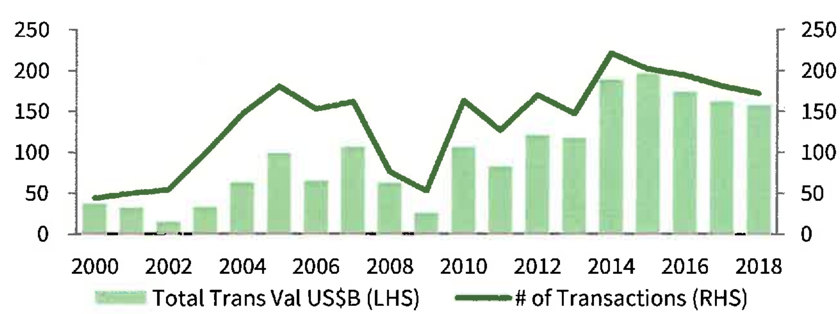
AVERAGE PURCHASE PRICE AND DEBT MULTIPLES: US PE

2000–18 (Dec 31)



EXIT ENVIRONMENT: US PE-BACKED M&A

2000–18 (Dec 31)



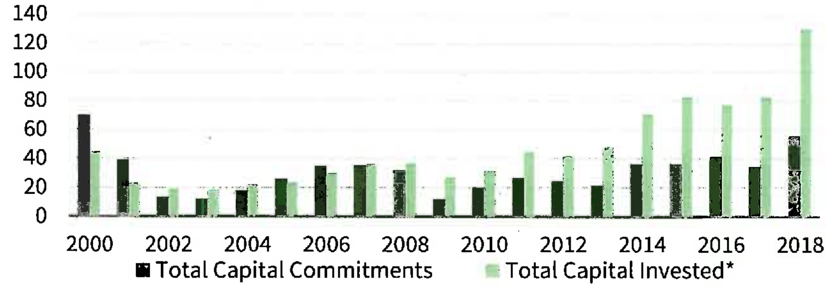
Sources: Cambridge Associates LLC, Dealogic, *The Private Equity Analyst*, and Standard & Poor's LCD.

Updated June 2019

US Venture Capital
Facts & Figures

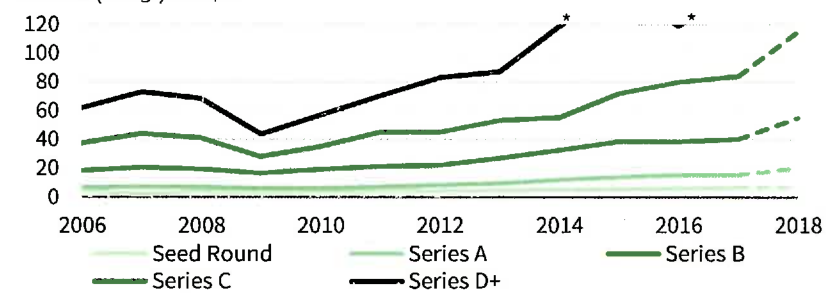
- First half 2018 was an active period for both fundraising and investing, putting the year on pace to match 2016 in fundraising and potentially hit historic highs in the amount of capital invested (not the number of deals). "Unicorn" transactions helped boost the value of deals. For context, fundraising in 2016 hit its highest level since 2000.
- Pre-money valuations continued to rise across the board in first half 2018 and most notably for companies raising series C and later rounds of financing. For late-stage companies (series D and beyond), valuations averaged about $142 million in 2013–16 and jumped to $225 million in 2017 and to $278 million in the first six months of 2018.
- Elevated pricing is at least in part due to the choice to remain private (as opposed to going public or seeking an M&A transaction) and to raise capital from new sources of late-stage financing both in and outside the United States. Further, according to the NVCA and PitchBook, companies are "older" at all financing rounds than they have been since 2010. The most extreme example of this trend is those companies receiving seed-stage financing, whose average age (3.1 years) has doubled since 2012.
- In 2017, combined exits via M&A/IPO/LBO hit their lowest level since 2011, driven largely by the decline in M&A (a trend that started in 2014 and continued into 2018). With 43 IPOs in the first six months of 2018, the year is on track to be the most active since 2014. Of the ten largest IPOs for the year, eight were "unicorn" companies and six were IT companies (among them DocuSign, Mercari, and Carbon Black). Private equity buyouts (154) of venture-backed companies hit their highest number ever in 2017 and are on track to meet or exceed that number in 2018 (79 in the first half).

CAPITAL COMMITMENTS AND INVESTMENTS: US VC
2000–18 (Dec 31) • US$B



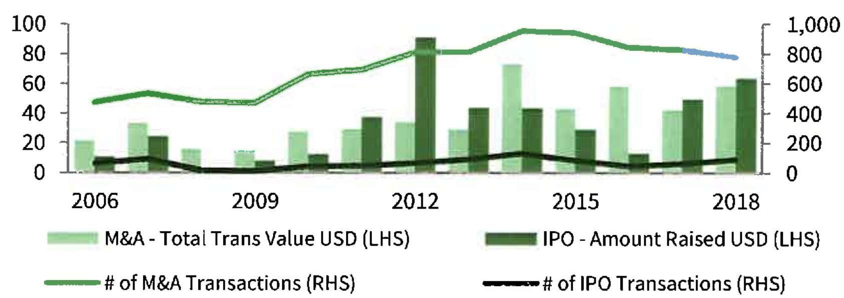
*Includes capital invested by funds, crossover investors, and corporate venture arms.

MEDIAN PRE-MONEY VALUATIONS BY STAGE, ALL SECTORS
2006–18 (Dec 31) • US$M



* Scale capped at 120. The median pre-money valuation for Series D+ deals in 2018 was $275.

EXIT ENVIRONMENT: US VC-BACKED IPOS AND M&A
2006–18 (Dec 31) • LHS in Billions



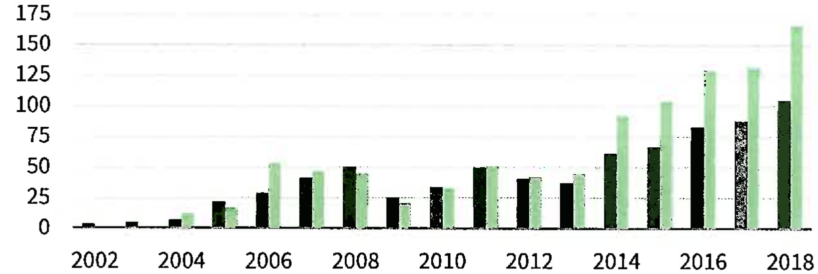
Sources: National Venture Capital Association and PitchBook.

Updated June 2019

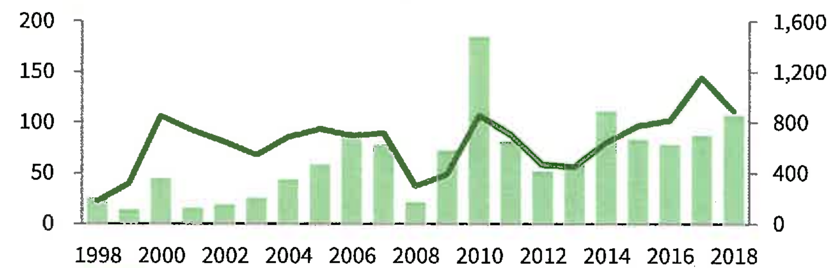
Asian Private Equity
Facts & Figures

- Fundraising has climbed steadily since 2013, hitting roughly $83 billion in both 2016 and 2017. The first half of 2018 was also a strong period of fundraising, putting the year on pace to eclipse the previous two.
- Pan-Asian private equity funds are among those successfully raising capital and "dry powder" should increase throughout 2018. This could exacerbate entry valuations, which have been climbing for the larger deals for which these funds compete.
- PE managers in China have been focusing on consumer, healthcare, and advanced manufacturing. While control deals are growing more prevalent, many continue to pursue late-stage technology venture deals, as well. Valuations could elevate further as fund sizes rise and there is more RMB capital competing for deals.
- Amid rising purchase prices, Asian PE and VC investment activity remains brisk, with 2018 on track to exceed the peaks hit in 2016 and 2017.
- Venture capital activity and valuations in Asia—particularly in China—peaked in 2015, fell in 2016, and reached new peaks in 2017. Companies perceived as having good prospects are attracting strong and fast follow-on financing rounds, bringing growth equity players into the fray.
- According to Dealogic, M&A activity in 2017 was modestly higher than 2016 in terms of number and value of transactions in USD terms; if the first half of 2018 is any indication, this year could end with a similar pace and a considerably higher value. IPOs dramatically increased in number in 2017 with the trend seemingly continuing in 2018. With respect to total value of IPOs, the first half of 2018 puts it on pace to exceed 2014, which is second only to 2010.

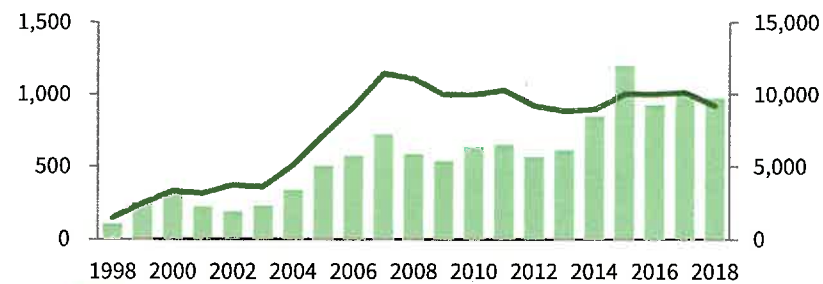
CAPITAL RAISED AND INVESTED IN ASIAN PRIVATE EQUITY
2002–18 (Dec 31) • US$B



EXIT ENVIRONMENT: ASIA PACIFIC IPOS
1998–2018 (Dec 31)



EXIT ENVIRONMENT: ASIA PACIFIC M&A
1998–2018 (Dec 31)



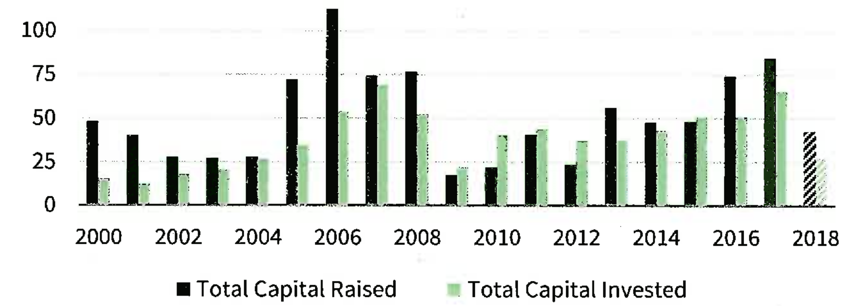
Sources: Asia Private Equity Review and Dealogic.

Updated June 2019

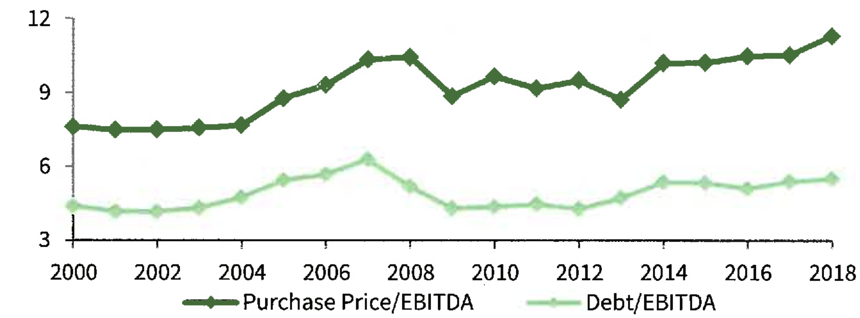
European Private Equity
Facts & Figures

- Fundraising activity has steadily increased since 2014 and in 2017 hit the highest level since 2008. We expect fundraising to drop slightly in 2018 and pick back up in 2019.
- According to Invest Europe, investment activity in 2017 accelerated quite a bit (nearly 30% higher than in 2016), making it the most active year since 2007. Indications are that 2018 will be an equally, if not more, active year.
- The pricing environment observed since 2014 has remained intact, with accessible credit and elevated leverage multiples (average debt/EBITDA levels into 2018 have been north of 5.0 times). Equity contributions to leveraged buyouts (LBOs) were about 44% in 2017, in line with the five-year average. Through April 2018, the equity contribution averaged 48%.
- Across the deal size spectrum, purchase price multiples have been climbing steadily since 2013. Large transactions, those worth more than €1 billion, transacted at 11.6 times EBITDA in 2017; over the first five months of 2018, similarly sized companies have transacted at 10.9x.
- Since 2014, the average trailing 12-month purchase price multiple for transactions of €500 million and above has been north of 10 times EBITDA. Prices in 2018 have been holding steady at 10.4x.
- PPMs for small companies have continued to increase, reaching 10 times EBITDA in 2018.
- While valuations remain high, investors are encouraged to seek opportunities with middle-market and regional specialists, where valuations are less elevated and interesting opportunities are available.

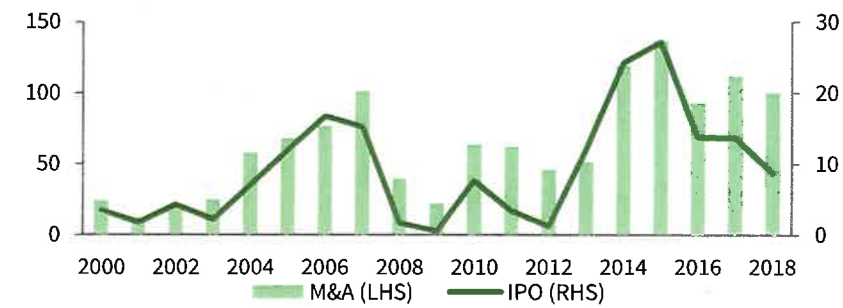
CAPITAL RAISED AND INVESTED IN EUROPEAN PE FUNDS
2000–18 (Jun 30) • €B



AVERAGE PURCHASE PRICE AND DEBT MULTIPLES: EUROPEAN PE
2000–18 (Dec 31)



EXIT ENVIRONMENT: EUROPEAN PE-BACKED IPOS AND M&A
2000–18 (Dec 31) • €B



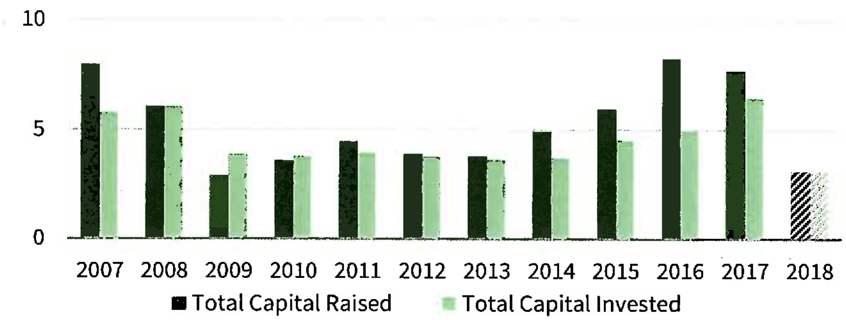
Sources: Dealogic, Invest Europe, and Standard & Poor's LCD.

Updated June 2019

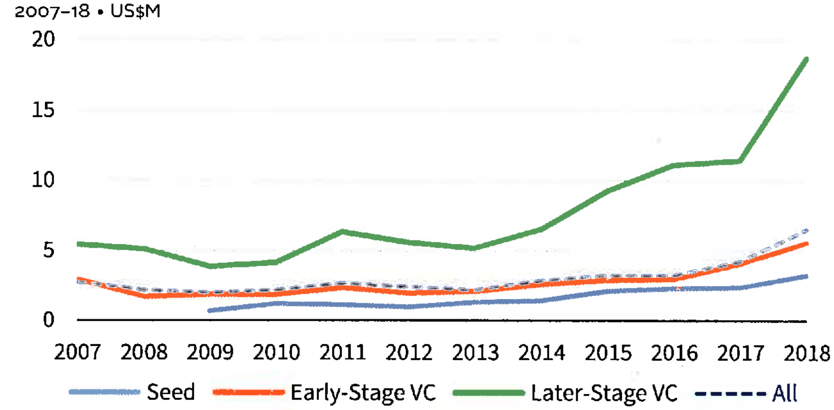
European Venture Capital
Facts & Figures

- According to Pitchbook, late-stage valuations declined slightly in 2017 after hitting their highest level since 2003 in the previous year (2016).
- Early-stage valuations have grown steadily since 2012, and in 2017, they reached their highest point since 2005.
- According to both Invest Europe (€7.7 billion) and Pitchbook (€8.8 billion), fundraising activity slowed somewhat in 2017 compared to both data sources amounts for 2016 (over €8 billion and €10 billion for Invest Europe and Pitchbook, respectively). While the data indicate the total number of funds being raised has decreased over time, in our experience the number of institutional quality European VC funds has increased.
- Investment activity has continued to grow. According to Invest Europe, the nearly €6.5 billion invested by European VCs was 30% higher than the amount invested in 2016 and the highest investment total since 2008. These fund-led investments reflect only a portion of the capital invested in European companies by global, corporate, and financial venture investors. Pitchbook, which captures a broader set of investments than does Invest Europe (including fund, global, corporate, and cross-over investments), estimates that investment levels were more than €8 billion and noted that in 2017 US venture investors alone accounted for 17% of all capital invested in European deals. PitchBook's data suggest that first quarter 2018 was also an active period that would put 2018 in position to nearly match 2017 with respect to investments in venture capital.
- In the recent and current market, larger and later deals are more prominent in investments being made and exited in Europe and fund sizes have also increased.

CAPITAL RAISED AND INVESTED IN EUROPEAN VENTURE FUNDS
2007–18 (Jun 30) • €B



MEDIAN PRE-MONEY VALUATIONS BY ROUND
2007–18 • US$M



Sources: Pitchbook and Invest Europe.

Updated June 2019

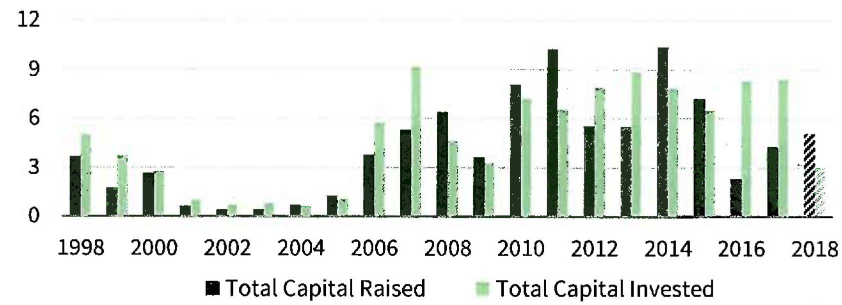
Latin American Private Equity

Facts & Figures

- After a slow 2016 and 2017, fundraising activity picked up in first half 2018. According to the Latin American Venture Capital and Private Equity Association, Latin American–focused funds raised $5.1 billion in the first half of the year, an 18% increase over total-year fundraising activity in 2017; 63% of the capital was raised by funds with pan-regional strategies.
- Investment activity, on the other hand, has slowed down compared to the prior two years, in terms of capital invested. In first half 2018, $3.0 billion was deployed, representing a 33% decrease relative to the first half of 2017. However, the number of transactions increased by 23% in the same period, indicating that venture capital and mid-market activity continued to be strong.
- In fact, in first half 2018, 145 venture capital transactions were completed across the region, representing $722 million of invested capital. This represents an increase of 58% and 51% versus first half 2017, respectively.
- Brazil continues to be Latin America's most active country in terms of capital invested and number of deals. Additionally, due to the growing venture capital industry, technology now represents the most active sector in Latin America in terms of number of deals and capital invested.
- The M&A and IPO environment picked up across Latin America in 2017, though it remains below peak years. IPO activity, historically driven by Brazil, continued to improve significantly after a very slow 2014–16.
- The economic recession of 2015–16 in Brazil resulted in a record number of distressed credit situations, offering investors a set of new, differentiated, and potentially attractive investment opportunities. Fundraising and investment activity in the space, though harder to quantify, has been growing strongly in the last year.

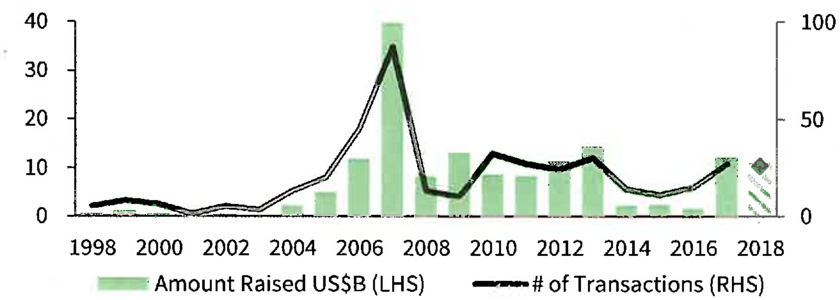
CAPITAL RAISED AND INVESTED IN LAT AM/CARIBBEAN PE FUNDS

1998–2018 (Jun 30) • US$B



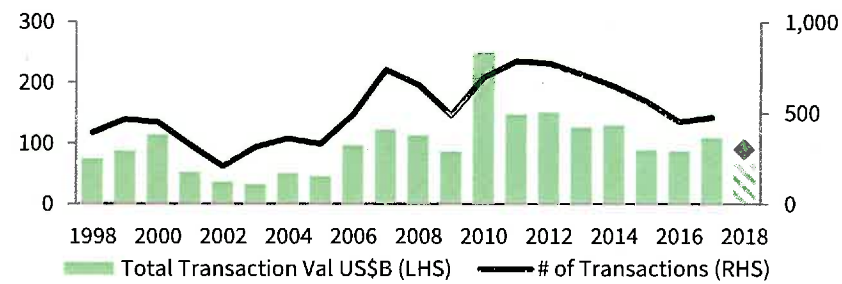
EXIT ENVIRONMENT: LATIN AMERICA/CARIBBEAN IPOS

1998–2018 (Oct 31)



EXIT ENVIRONMENT: LATIN AMERICA/CARIBBEAN M&A

1998–2017 (Oct 31)



Sources: Dealogic and Latin American Private Equity & Venture Capital Association.

Updated June 2019

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San Diego, CA 92121

MASSACHUSETTS
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3rd Floor
Danvers, MA 01923

City and County of San Francisco Employees' Retirement System

Annual Private Equity Performance Update

July 2019

TorreyCove Capital Partners

ANNUAL PRIVATE EQUITY PERFORMANCE UPDATE

Portfolio Overview

As of December 31, 2018

- Since inception (1987) SFERS has committed $11.59 B to 379 investments.
- SFERS has received $8.55 B or 99.6% of contributed capital.
- The private equity portfolio has generated a since inception net IRR of 15.9% and a TVPI[1] of 1.60x.
- The current market value of the portfolio is $4.87 B.
- There are 121 active managers overseeing 291 funds holding at least 2,823 underlying portfolio companies.

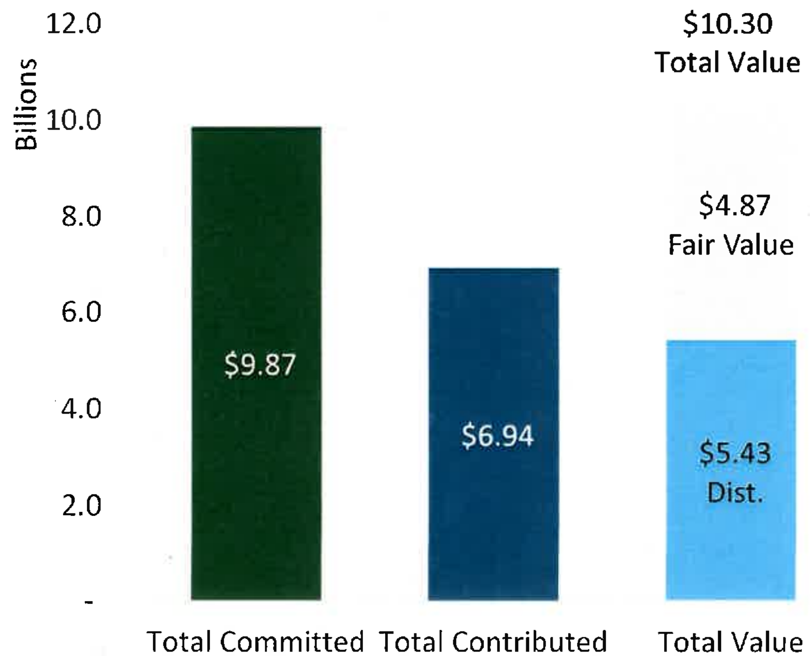
1 TVPI is calculated using contribution and distribution amounts net of recallable capital. Contributions and distributions above are gross of recallable capital.

Portfolio Overview

As of December 31, 2018

Active Portfolio:
Net IRR 10.8%; TVPI[1] 1.52x; 8.3 Years WAA[2]; 291 Investments

Exited Portfolio:
Net IRR 20.9%; TVPI[1] 1.91x; 16.2 Years WAA[2]; 88 Investments



1 TVPI is calculated using contribution and distribution amounts net of recallable capital. Contributions and distributions above are gross of recallable capital.
2 WAA = Weighted Average Age; weighting based on contributions through December 31, 2018.

2018 Year in Review

- SFERS' Private Equity program has placed in the top ten of every American Investment Council ranking of U.S. public pension funds' ten-year PE returns since the inaugural study in 2012.[1]
- As of December 31, 2018, the private equity allocation relative to the total pension assets was 20.3% versus a target of 18.0%. This represents a 450 basis point increase compared to 2017 year end allocation of 15.8%.
  - Approximately 68% of the 450 basis point increase can be attributed to appreciation, with the other 32% attributed to net cash flows
- The weighted age of the portfolio decreased by 3.0% declining to 9.8 years from 10.1 years at year-end 2017; the program's investment pace continues to exceed the aging of the portfolio.
- A total of 30 investments were authorized in 2018 for a total of $1,437.5 M in commitments.
- During 2018, the portfolio closed on 33 funds for a total of $1,369.5 M in commitments.
  - Commitments to Buyout and Venture Capital strategies accounted for 76.6% at $665.0 M and $384.3 M, respectively.
  - Commitments were primarily focused on North America and Asia Pacific at 42% and 42%; Global 12%, and Latin America 4%.

1 American Investment Council Public Pension Studies years 2012 – 2016 & 2018. Ranking based on an annualized 10-year return. No report was issued in 2017.

TorreyCove
CAPITAL PARTNERS

ANNUAL PRIVATE EQUITY PERFORMANCE UPDATE

Performance - Portfolio

- Relative to the blended benchmark of the Russell 3000 and MSCI ASWI +300 bps, the portfolio exceeds returns every period except 10 year.
- The portfolio has performed in line with or exceeded the Cambridge Associates Index in all periods across all performance metrics except DPI.
- Growth Capital, Venture Capital, and Buyout Strategies contributed to annual returns appreciating by 25.3%, 24.2%, and 9.9%, respectively, over year end 2017 fair values.
- Funds focused on the Asia Pacific region appreciated 28.1% over the year while North America funds appreciated by 18.0%.
- The largest ten managers (40.4% of total exposure) contributed to portfolio returns with an aggregate ITD net IRR of 23.1%.
- Of the 327 investments with vintage years 2016 and older, 251 are valued at 1.25x invested capital or greater; 88 are valued at 2.0x or greater.

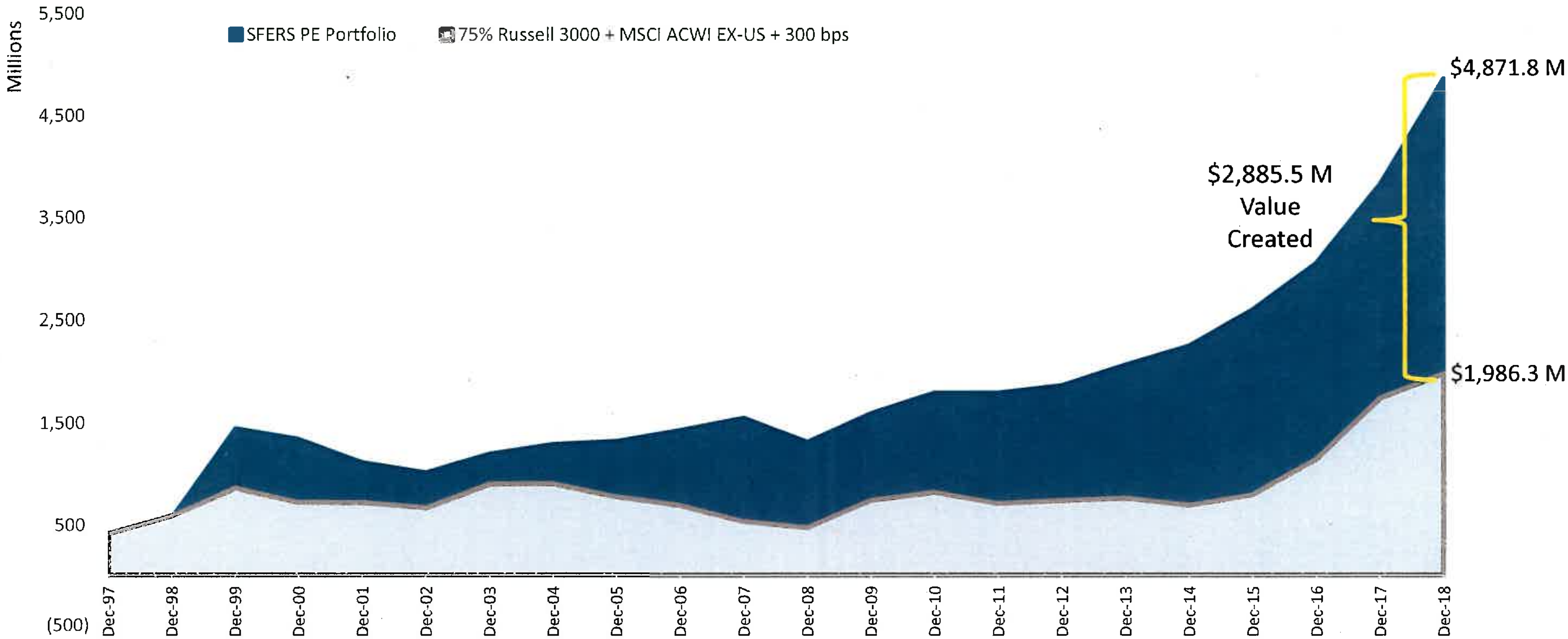
	Net IRR						Multiples	
12/31/2018	1 YEAR	3 YEAR	5 YEAR	10 YEAR	20 YEAR	ITD	DPI	TVPI
Program Totals	**17.6%**	**14.1%**	**14.1%**	**14.0%**	**13.4%**	**15.9%**	**1.00x**	**1.60x**
Custom Benchmark[1]	-4.4%	10.8%	9.1%	14.6%	8.5%	11.6%	NA	NA
Difference	*22.0%*	*3.3%*	*5.0%*	*-0.6%*	*4.9%*	*4.3%*	*NA*	*NA*
Cambridge Associates[2]	10.6%	12.7%	11.7%	13.7%	12.3%	13.4%	**1.11x**	**1.60x**
Difference	*7.0%*	*1.4%*	*2.4%*	*0.3%*	*1.1%*	*2.5%*	*-0.10x*	*0.00x*

1 Represents a 75% weighting of Russell 3000 + 25% weighting of MSCI ASWI ex-US + 300 bps. Index returns are time weighted rates of return.
2 Cambridge Associates pooled IRR and TVPI: All private equity funds (excluding timber, real estate, private equity energy, upstream energy & royalties, and infrastructure) inclusive of vintage years through 2018 in the U.S., Canada, Europe, Global and Asia/Pacific markets as of December 31, 2018. Cambridge Associate's data is continually updated and is subject to change. The portfolio does not have commitments to vintage years 1988 and 1989.

Performance – Portfolio PME[1]

SFERS Portfolio vs 75% Russell 3000 + 25% MSCI ACWI EX-US (+ 300 bps)

As of December 31, 2018

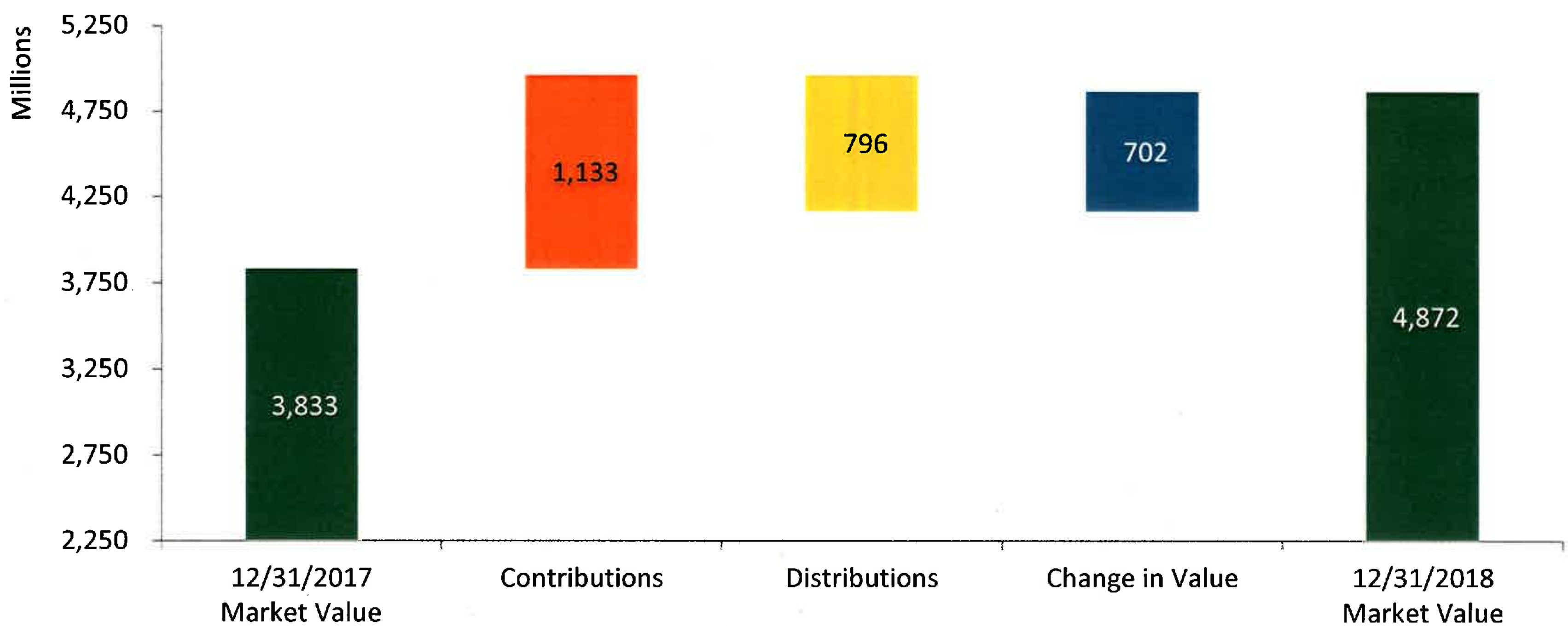


1 The portfolio PME is a dollar-weighted Long-Nickels calculation of quarterly changes in blended benchmark of 75% Russell 3000 total return index + 25% MSCI ACWI ex-US total return index + 300 basis point

2 Custom Index is based on 100% weighting of Russell 3000 + 300 basis points through 1998 (prior to inception date of MSCI ACWI ex-US) and 75% Russell 3000 + 25% MSCI ACWI ex-US + 300 basis points thereafter.

Portfolio Value Bridge

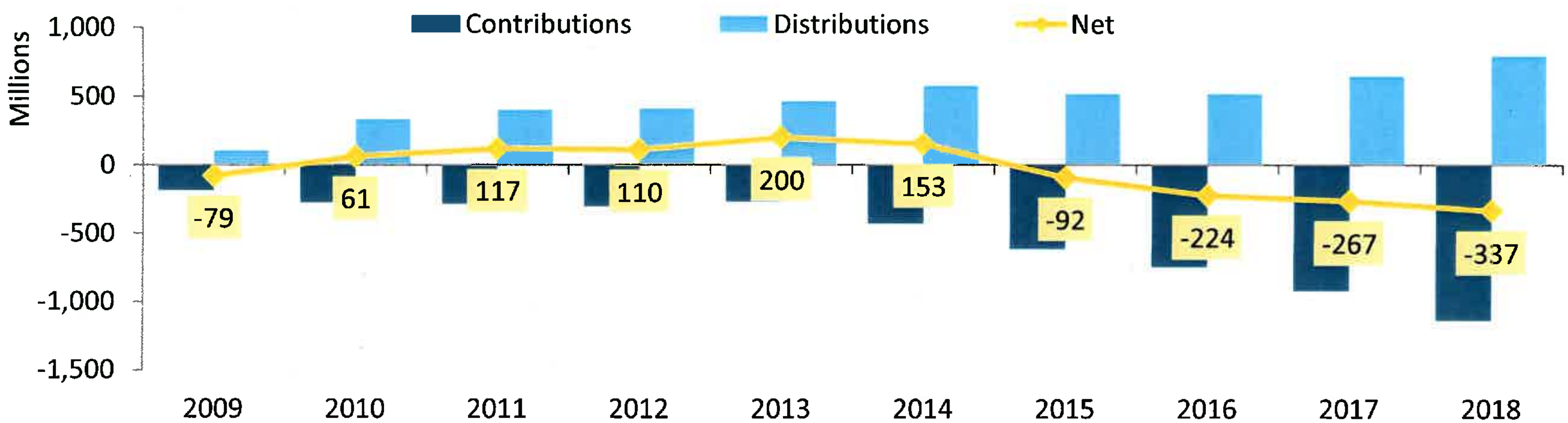
December 31, 2017 through December 31, 2018



Annual Cash Flows

As of December 31, 2018

- Contributions continued to exceed distributions over 2018; the increased pace in commitments over 2014 and 2015 resulted in contributions outpacing distributions in Q1 2015 for the first time since Q4 2011.
- Relative to 2017 fair value, Special Situations distributed the largest amount of capital at $59.0 M (31.5% of fair value); on an absolute basis, the Buyout strategy distributed the greatest amount at $356.7 M (44.8% of total distributions).
- Venture Capital contributed the largest amount of capital relative to unfunded amounts at 41.8% ($349.6 M). On an absolute basis, the Growth strategy contributed the most capital at $356.9 M (31.5% of total contributions).
- All strategies across the portfolio saw a continued increase in absolute amounts of both contributions and distributions over prior years.



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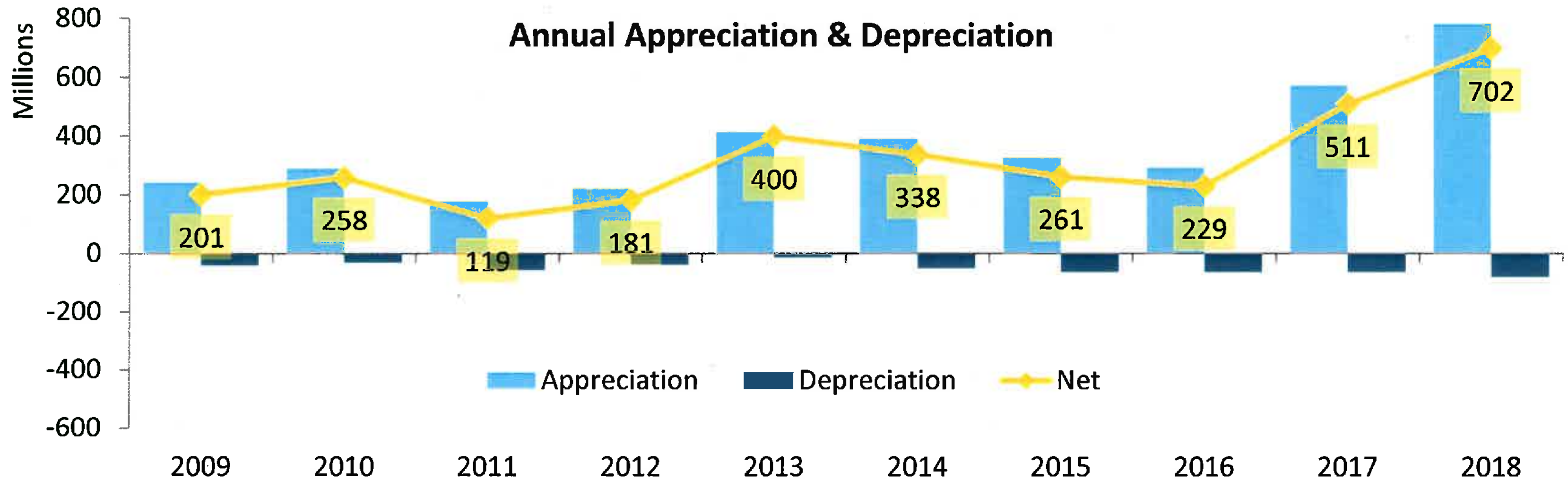
Annual Appreciation & Depreciation

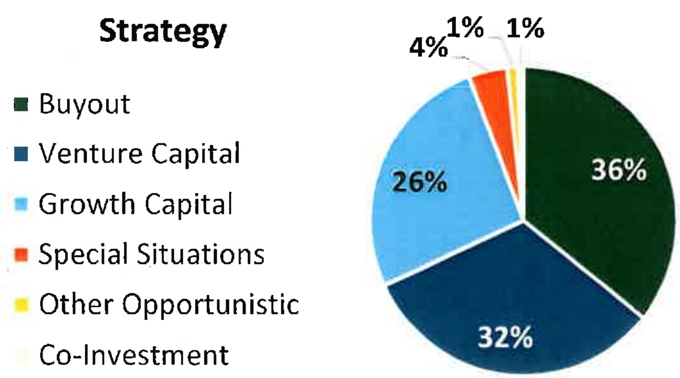
As of December 31, 2018

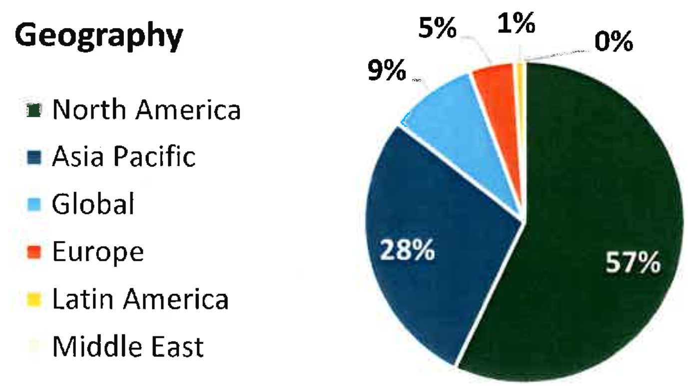
- Over 2018, a total of 180 funds appreciated and 107 funds depreciated for a total net appreciation of $701.9 M.
- Venture Capital strategy funds drove the appreciation for the year accounting for 44.7% of net appreciation; Growth Capital followed at 30.2%.
- Appreciation for 2018 was concentrated in funds with vintage years between 2014 and 2016 which account for 74.4% of net annual appreciation. These 2014 through 2016 funds have made up 22.2% of contributions inception-to-date.

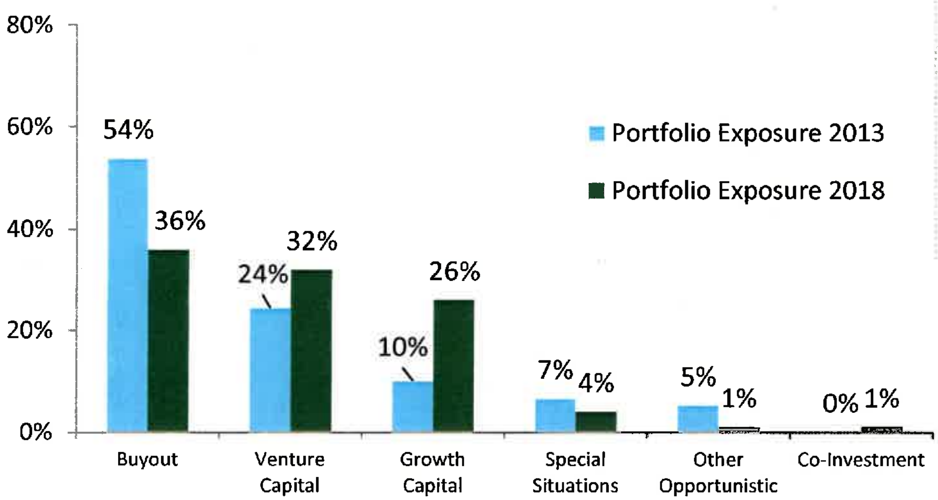


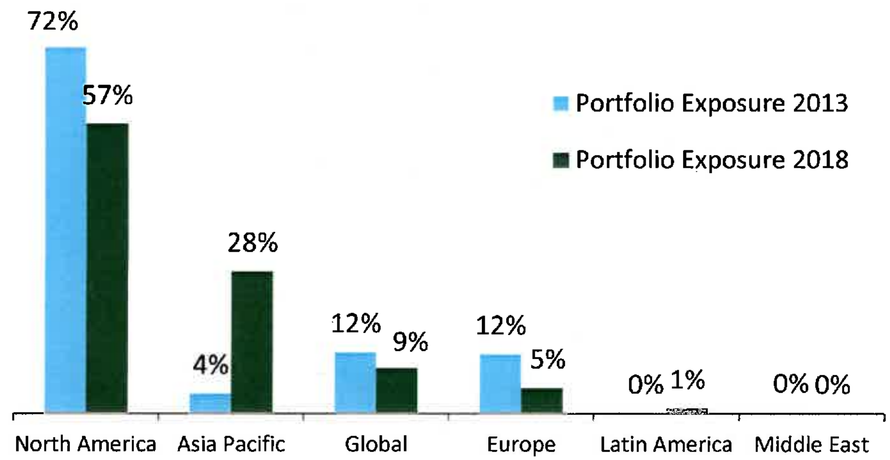
Exposure* – Fund Level

As of December 31, 2018









*Exposure = FMV + Unfunded

Appendix A

Performance – Strategy Net IRR

Cambridge Associates Index[1]

As of December 31, 2018

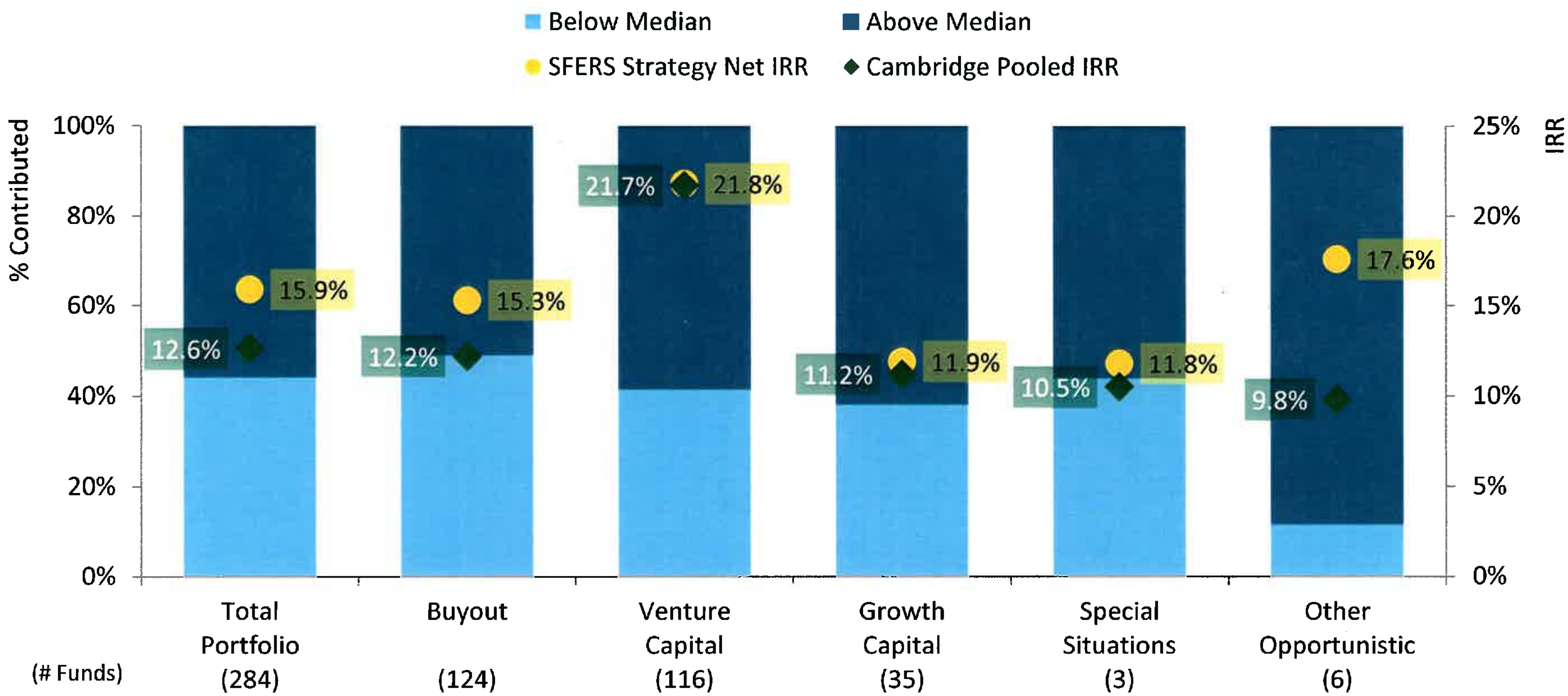
	Net IRR						Multiples	
	1 YEAR	3 YEAR	5 YEAR	10 YEAR	20 YEAR	ITD	DPI	TVPI
Buyout	**9.9%**	**14.6%**	**13.1%**	**14.4%**	**14.0%**	**15.3%**	**1.23x**	**1.67x**
Cambridge Associates	9.1%	14.2%	12.1%	14.0%	11.9%	12.2%	1.19x	1.62x
	0.8%	*0.4%*	*1.0%*	*0.4%*	*2.1%*	*3.1%*	0.04x	0.05x
Venture Capital	**22.7%**	**10.7%**	**15.5%**	**13.4%**	**14.3%**	**21.8%**	**0.83x**	**1.61x**
Cambridge Associates	17.4%	9.9%	12.9%	12.6%	16.3%	21.7%	1.12x	1.72x
	5.3%	*0.8%*	*2.6%*	*0.8%*	*-2.0%*	*0.1%*	*-0.29x*	*-0.11x*
Growth Capital	**22.9%**	**20.0%**	**16.9%**	**15.8%**	**10.9%**	**11.9%**	**0.60x**	**1.45x**
Cambridge Associates	15.1%	13.2%	12.8%	13.3%	10.9%	11.2%	0.91x	1.60x
	7.8%	*6.8%*	*4.1%*	*2.5%*	*0.0%*	*0.7%*	-0.31x	-0.15x
Special Situations	**11.9%**	**13.1%**	**7.3%**	**12.4%**	**10.1%**	**11.8%**	**1.11x**	**1.50x**
Cambridge Associates	-2.2%	9.5%	7.1%	12.9%	10.6%	10.5%	1.05x	1.53x
	14.1%	*3.6%*	*0.2%*	*-0.5%*	*-0.5%*	*1.3%*	*0.06x*	*-0.03x*
Other Opportunistic	**17.3%**	**15.8%**	**12.3%**	**11.9%**	**15.5%**	**17.6%**	**1.37x**	**1.57x**
Cambridge Associates	6.2%	8.0%	7.5%	14.6%	9.6%	9.8%	1.28x	1.43x
	11.1%	*7.8%*	*4.8%*	*-2.7%*	*5.9%*	*7.8%*	0.09x	0.14x
Co-Investment	**11.1%**	**N/A**	**N/A**	**N/A**	**N/A**	**12.5%**	**0.10x**	**1.15x**
Total	**17.5%**	**14.1%**	**14.1%**	**14.0%**	**13.4%**	**15.9%**	**1.00x**	**1.60x**

1 Cambridge Associates pooled IRRs as of December 31, 2018. Cambridge Associates strategy benchmarks are comprised of similar regions and vintage years for each respective strategy in the SFERS portfolio. No comparable benchmark data is available for the co-investment strategy.

Performance – Strategy

Cambridge Associates Index[1]

As a % of Contributed Capital | December 31, 2018



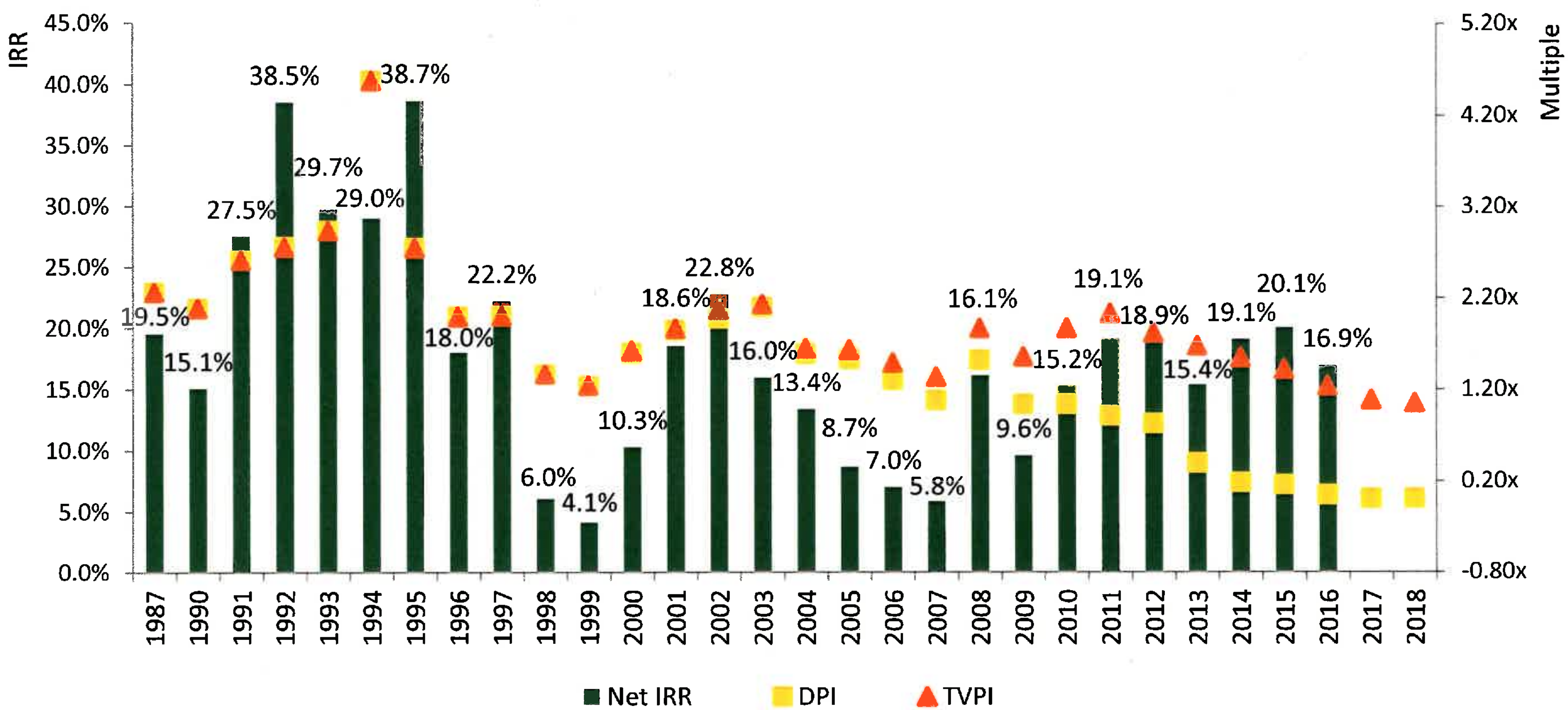
1 Cambridge Associates pooled IRRs as of December 31, 2018. Cambridge Associates pooled IRR comprised of similar regions and vintage years for the portfolio and each respective strategy in the SFERS portfolio. Above and below median data excludes funds that could not be benchmarked due to age (younger than two years) or lack of available Cambridge Associates data.

TorreyCove Capital Partners

ANNUAL PRIVATE EQUITY PERFORMANCE UPDATE

Performance – Vintage Year[1]

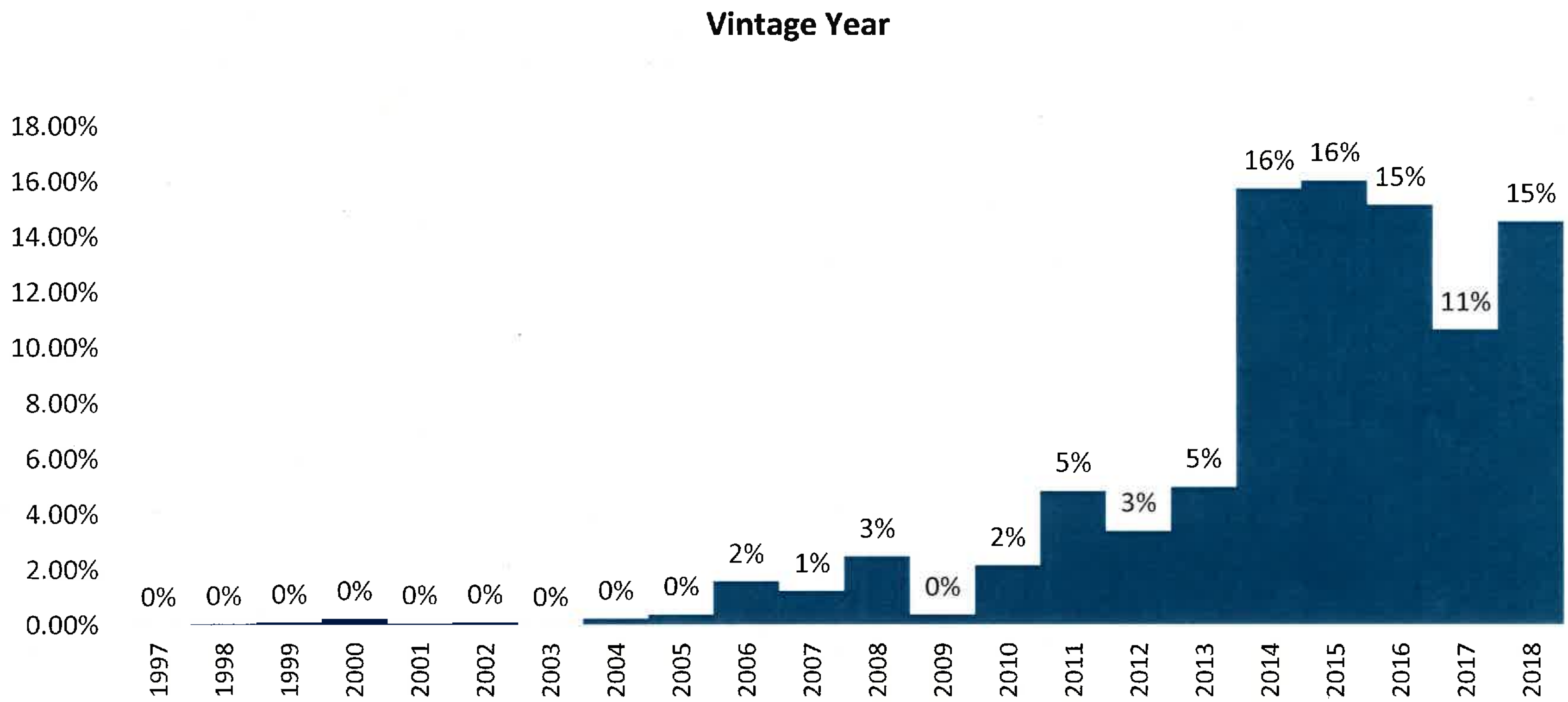
As of December 31, 2018



1 Performance of investments held less than two years is generally not meaningful and therefore the IRRs have been excluded.

Exposure* – Fund Level

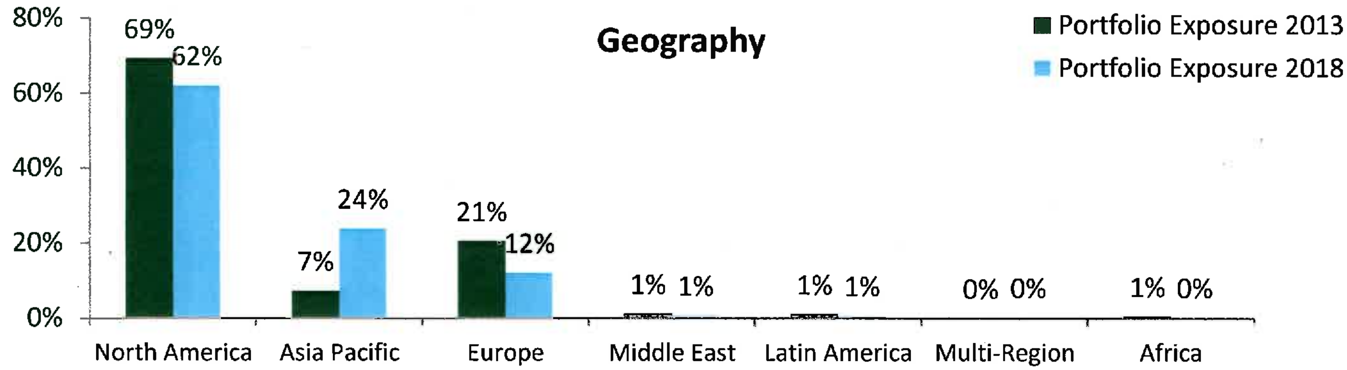
As of December 31, 2018

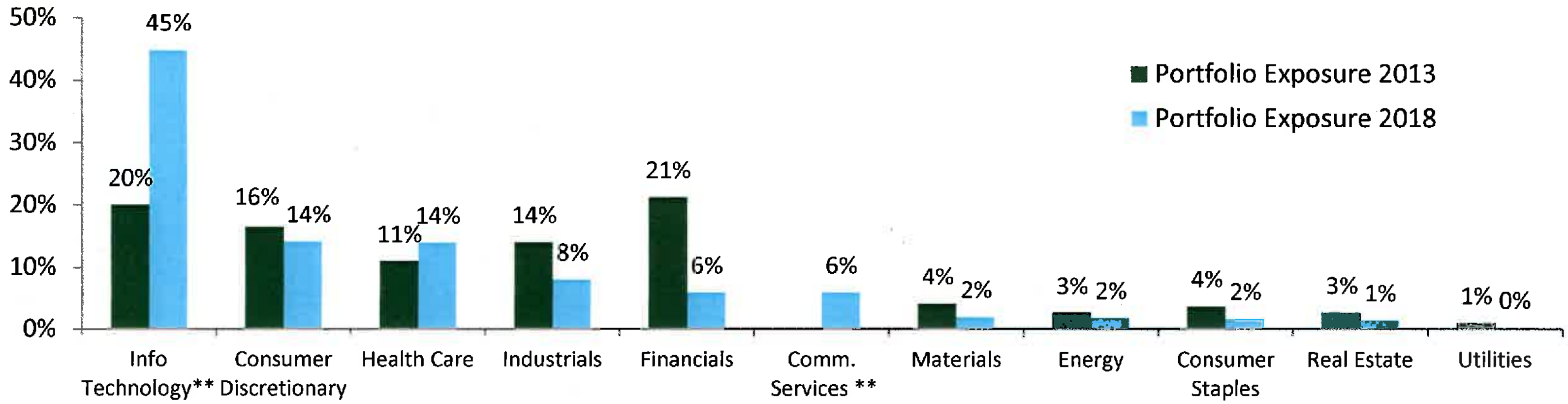


*Exposure = FMV + Unfunded

Exposure* – Portfolio Company Level Historical

December 31, 2013 vs December 31, 2018



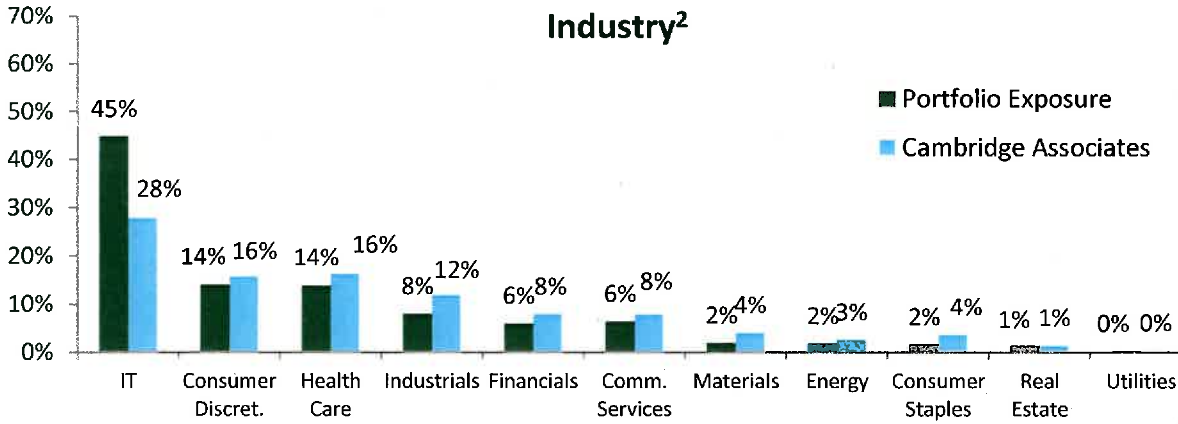


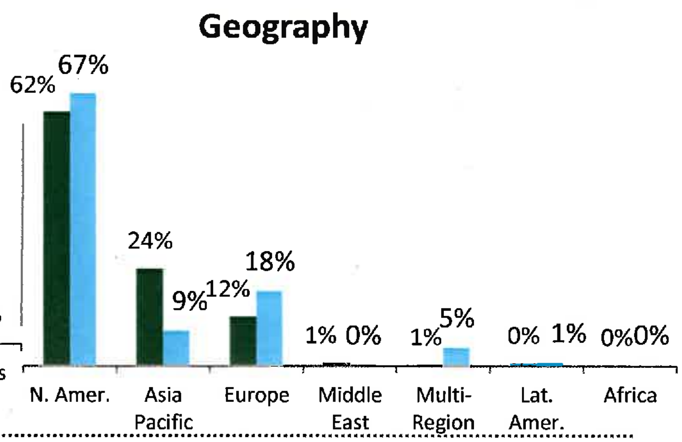
*Exposure = FMV

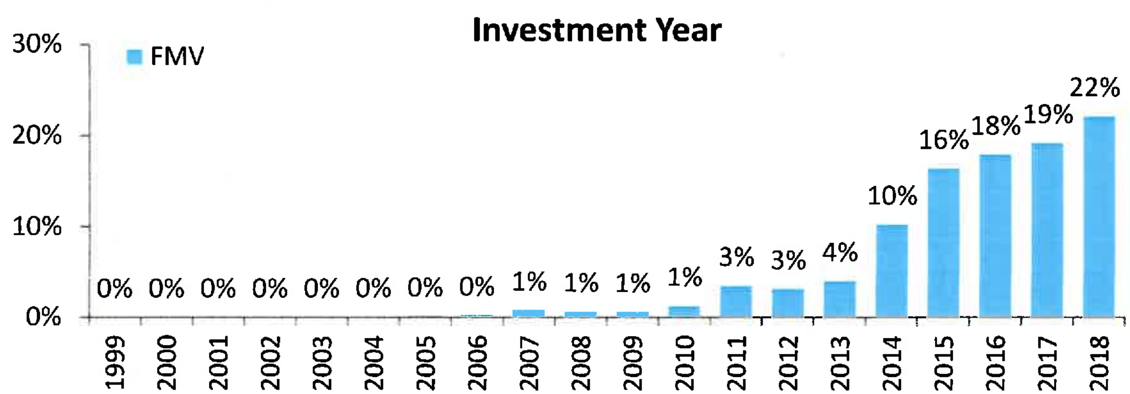
** Communication Services GICS added in 2018. Companies previously categorized as Information Technology or Telecommunication Services may now be categorized as Communication Services.

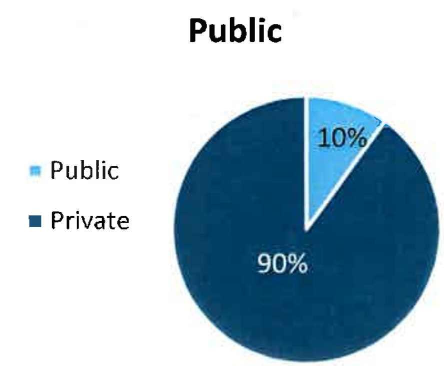
Exposure* – Portfolio Company Level[1]

As of December 31, 2018









*Exposure = FMV

1 Portfolio company data excluded where industry, geography, or investment year is not provided.

2 Benchmark used provided by Cambridge Associates and includes all vintage years, all industries, all geographies, and the following asset classes: Buyout, Growth Equity, Private Equity Energy, Subordinated Capital, and Venture Capital

TORREYCOVE
CAPITAL PARTNERS

Co-Investment Performance

As of December 31, 2018

(in millions USD)

Number of Co-investments	Total Invested	Market Value	TVPI	IRR	DPI	WAA
9	**130.4**	**114.2**	**1.32x**	**15.9%**	**0.44x**	**2.52**

- Of the nine co-investments, six are valued above cost, one is valued at cost, and two are valued below cost.
- One of the co-investments has been fully realized with a DPI of 1.53x.
- To date, $48.1 M has been committed in 2019 across three co-investments.

Transparency Report (AB 2833)[1]

- In 2018, a total of $70.1 M in net management fees were paid across $9.9 B in active commitments; since inception, the portfolio has resulted in $4.8 B of gains. Net management fees for the year were 0.8% relative to commitments.

	2018 Annual				Since Inception				
	Net MF	Realized Carry	Portfolio Company Fees	Other Exp.	Total Gains[3]	Total Commits	1 Year Gross IRR[5]	1 Year Net IRR	ITD Net IRR
$ Millions[2]	70.1	57.4	2.5	18.9	4,836.1	11,590.4	22.0%	17.6%	15.9%
% of Commitments[4]	*0.8%*	*0.7%*	*0.0%*	*0.3%*					

1 In aggregate, 89.7% of funds reported net management fee data, 76.2% of funds reported realized carry data, 56.9% of funds reported portfolio company fee data, and 75.5% reported other expense data.
2 Foreign currency values converted at the 12/31/2018 spot rate.
3 Total gains = fair market values + distributions – contributions. Gains reported are net of fees.
4 Commitment denominator includes commitments related to funds that provided data for each respective category.
5 Gross IRR is calculated by reversing the impact of reported realized and unrealized carry amounts, organization expenses, and net management fees.

Appendix B

Market Overview & Commentary

TorreyCove Capital Partners

MARKET OVERVIEW 4Q18
FUNDRAISING ACTIVITY NORTH AMERICA

BUYOUTS

- **4Q commitments:** $108.8 billion across buyout and mezzanine firms, a 63.1% increase from 4Q17 ($66.7 billion), and a 120.7% increase from 3Q18 ($49.3 billion). (Buyouts)
- As of January 14, 2019, funds targeting $5.0 billion or more had received 46.4% of capital, followed by funds targeting $1.0 billion to $5.0 billion with 37.9%. (Buyouts)
- With the surge in 4Q18 fundraising, the total funds raised in 2018 ($244.6 billion) slightly outpaced 2017 ($241.6 billion), representing an increase of 1.2%. (Buyouts)
- According to Buyouts, three funds broke $10.0 billion in funds raised during 2018, including the Carlyle Group, Hellman & Friedman, and Warburg Pincus. (Data as of December 5, 2018)
- According to Buyouts, considering only industry focused funds, consumer products/services funds raised the most capital during 2018, with $9.5 billion raised, followed by energy and power funds, which raised $8.6 billion. (Data as of December 5, 2018)

VENTURE CAPITAL

- **4Q commitments:** $23.1 billion, an 89.3% increase from 3Q18 ($12.2 billion). Funds raised in 2018 reached $55.5 billion, an increase of 62.8%. (Pitchbook)
- The number of fund closings totaled 256 during 2018, representing a 0.8% increase from 2017 when 254 funds closed fundraisings. (Pitchbook)
- First-time-funds raised $5.3 billion across 52 funds in 2018, an increase of 51.4% in value and 30.0% in count compared to 2017 ($3.5 billion raised across 40 funds). (Pitchbook)
- The 2018 median fund size increased by 64.0% year-over-year (from $50.0 million to $82.0 million). This represents the highest level in since 2008, when median fund size was $86.3 billion. (Pitchbook)

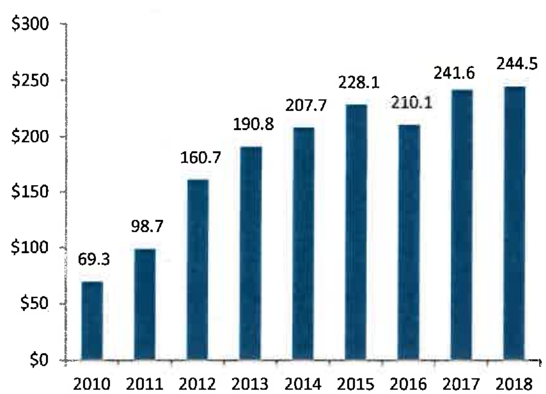
SPECIAL SITUATIONS

- **Distressed / Turnaround Debt:** $0.7 billion, a 84.1% decrease from 3Q18 ($4.6 billion) and a 3.5% increase from 4Q17 ($0.7 billion). (Thomson Reuters)
- GSO Capital Partners raised the fourth largest fund at $7.1 billion during 2018 with a distressed/turnaround strategy.
- **Mezzanine:** $5.3 billion, a 573.5% increase from 3Q18 ($0.8 billion) and a 12.7% increase from 4Q17 ($4.7 billion). (Thomson Reuters)
- **Fund of Funds / Secondary Funds:** $2.1 billion, a 63.5% decrease from 3Q18 ($5.8 billion) and a 67.2% decrease from 4Q17 ($6.5 billion). (Thomson Reuters)

	Largest Active U.S. Fundraisers in 2018	Fund Size
Buyout	Carlyle Partners VII	$18.5 billion
	Hellman & Friedman Capital Partners IX	$16.0 billion
Venture Capital	Warburg Pincus Global Growth Fund	$14.0 billion
	Tiger Global Private Investment Partners XI	$3.8 billion
Mezzanine	KKR Private Credit Opportunities Partners III	$2.2 billion
Distressed/Turnaround	GSO Capital Solutions Fund III	$7.1 billion
Fund of Funds	Landmark Equity Partners XVI	$7.0 billion

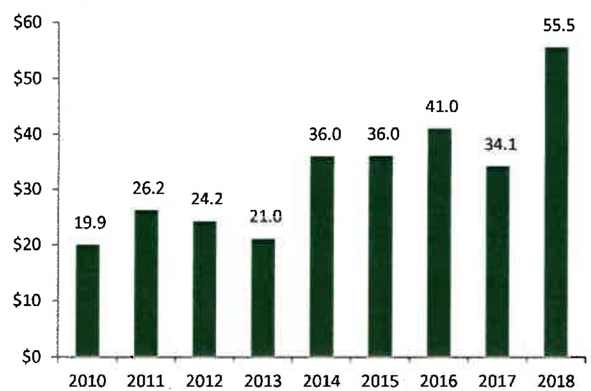
Source: Thomson Reuters

Buyout and Mezzanine Fundraising | $ Billion



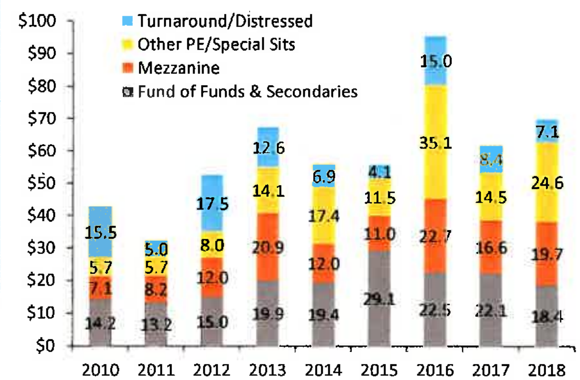
Source: Buyouts, as of January 14, 2019

Venture Capital Fundraising | $ Billion



Source: Pitchbook & National Venture Capital Association

Special Situations Fundraising | $ Billion



Source: Thomson Reuters

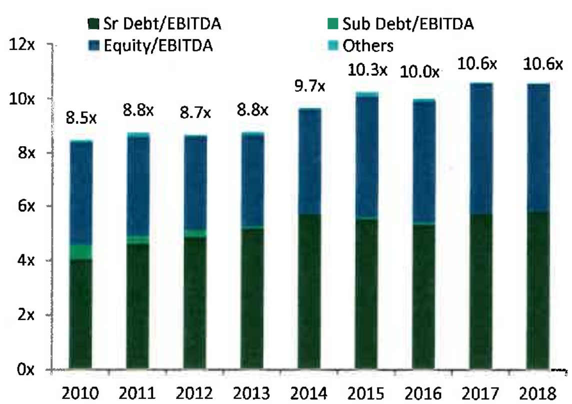
TORREYCOVE
CAPITAL PARTNERS

MARKET OVERVIEW 4Q18
INVESTMENT ACTIVITY NORTH AMERICA

BUYOUTS

- According to Thomson Reuters, disclosed deal value totaled roughly $109.0 billion in 4Q18, up 95.0% compared to 3Q18, when disclosed deal value totaled $55.9 billion.
- The largest U.S.-sponsored deal to close in 4Q18 was the $17.0 billion carve-out of Refinitiv, executed by a consortium led by Blackstone Group. (Buyouts) The consortium included Canada Pension Plan Investment Board and GIC. Refinitiv is a financial and risk business, based in the U.K., a carve-out from Thomson Reuters. (Blackstone)
- Blackstone Group's carve-out of Refinitiv accounted for 22.8% of the top 10 U.S.-sponsored deals closed in 4Q18. (Buyouts)
- Of 590 disclosed deals that closed during the period October 1, 2018 through December 31, 2018, high technology, industrials, and consumer products and services led with 132, 92, and 81 closed deals, respectively. (Buyouts)
- LBO purchase price multiples were 10.6x EBITDA by the end of 4Q18, flat when compared to 10.6x EBITDA at the end of 2017. (S&P Global)

LBO Purchase Price Multiples

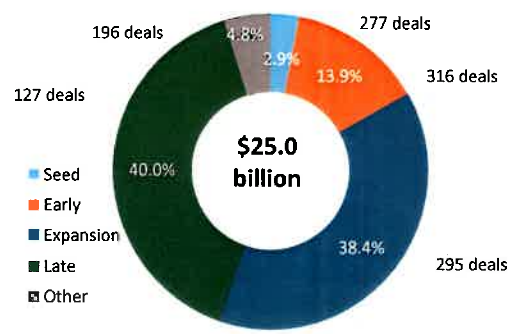


Source: S&P M&A Stats – December 2018

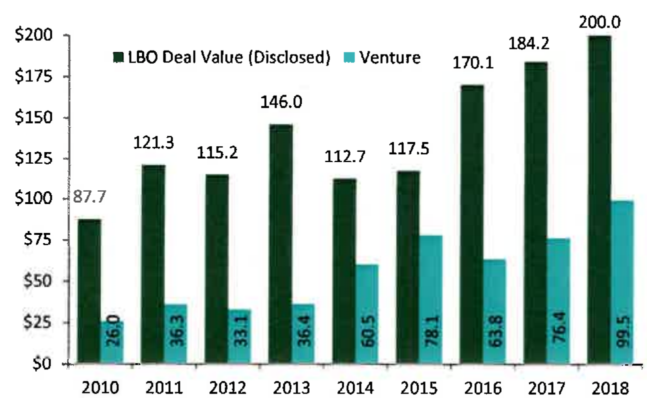
VENTURE CAPITAL

- Venture capitalists invested $25.0 billion in 1,211 deals in 4Q18, down 10.8% in value compared to 3Q18, when $28.0 billion went into 1,325 deals. (Pitchbook)
- The internet industry led all sectors during the quarter, garnering $9.1 billion through 540 deals. Internet deals were followed by healthcare and mobile and telecommunications, with $4.0 billion and $3.5 billion of capital invested through 162 and 150 deals, respectively. (PWC & CBI Insights)

U.S. 4Q Venture Investment by Stage



U.S. LBO & VC Investment Activity | $ Billion

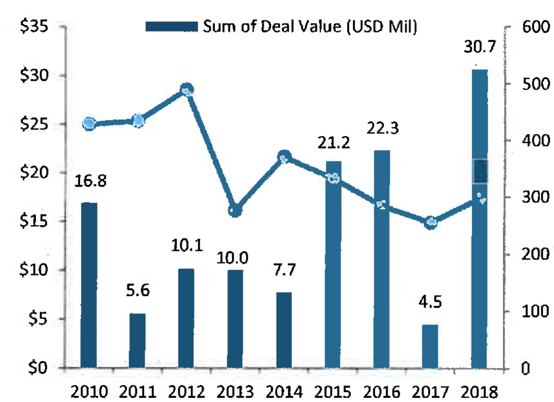


Source: Buyouts & National Venture Capital Association
Note: 4Q LBO figures through January 15, 2019

SPECIAL SITUATIONS

- **Distressed / Turnaround Debt:** There were 38 distressed / turnaround investments during 4Q18 for a total value of $11.4 billion, representing an increase of 46.2% in deal count and an increase of 1,233.1% in value compared to 3Q18 (26 deals for $858.3 million). (Thomson Reuters)
- **Mezzanine:** There were 30 mezzanine investments during 4Q18 for a total value of $59.1 million, representing an increase of 50.0% in deal count and 414.1% in value compared to 3Q18 (20 deals for $11.5 million). (Thomson Reuters)
- **Fund of Funds / Secondary Funds:** There were 20 fund-of-funds and secondaries fund investments during 4Q18 for a total value of $7.1 billion, representing an increase of 5.3% in deal count and 4,427.5% in value compared to 3Q18 (19 deals for $156.8 million). (Thomson Reuters)

Special Situations Investment Activity | $ Billion



Source: Thomson Reuters

TORREYCOVE
CAPITAL PARTNERS

MARKET OVERVIEW 4Q18
INVESTMENT ACTIVITY + EXITS NORTH AMERICA

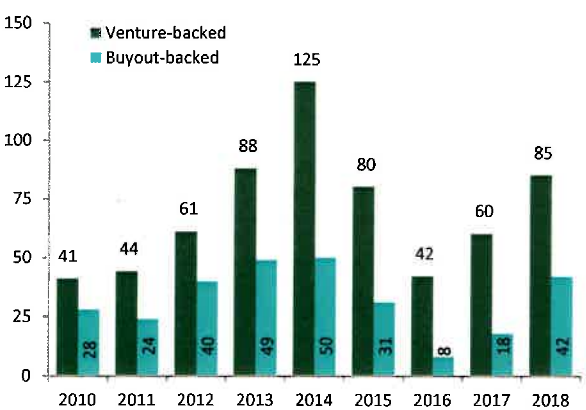
EXITS

- According to Buyouts, there were five buyout-backed IPOs in the U.S. during 4Q18 totaling $0.6 billion in value.
- There were 123 buyout-backed M&A exits in 4Q18. The deals with disclosed financial terms had a total valuation of approximately $34.6 billion. Of the deals with disclosed value, 13 crossed the billion-dollar mark. (Buyouts)
- High technology accounted for 26 buyout-backed M&A exits during 4Q18, which represents 21.1% of the total exits. Consumer products were the second largest by deal count with 18 deals, while the financials and energy and power industries closely followed with 13 and 12 exits each, respectively. (Buyouts)
- 4Q18 saw the weakest PE-backed IPO activity during the year, but 2018 overall saw the strongest PE-backed IPO activity since 2014. (Buyouts)
- According to Pitchbook, U.S. venture-backed M&A exits totaled 864 during 2018 with total disclosed value of $122.0 billion. This represents a significant increase in value compared with 2017 ($92.0), despite deal count being relatively flat (885).
- There were 85 venture-backed IPOs in 2018 valued at $63.6 billion, representing a 46.5% increase in count and 28.0% increase in value from 2017 where 58 IPOs were valued at $49.7 billion. (Pitchbook)

Largest U.S. Liquidity Events in 4Q 2018

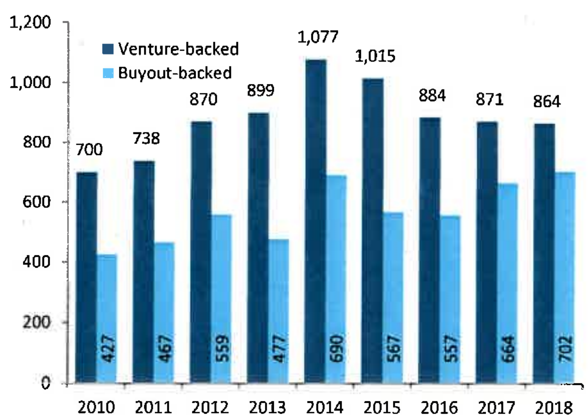
	Sponsors	Company	Value
PE-backed IPO	Cortec Group	YETI Coolers LLC (NYSE:YETI)	$0.3 billion
VC-backed IPO	Sequoia Capital	Moderna Therapeutics (NASDAQ:MRNA)	$0.6 billion
PE-backed M&A	Vista Equity Partners	Marketo	$4.8 billion
VC-backed M&A	Andreessen Horowitz and Sequoia Capital	GitHub	$7.5 billion

Number of U.S.-based IPOs



Source: Buyouts, Pitchbook & National Venture Capital Association

Number of U.S.-based M&A

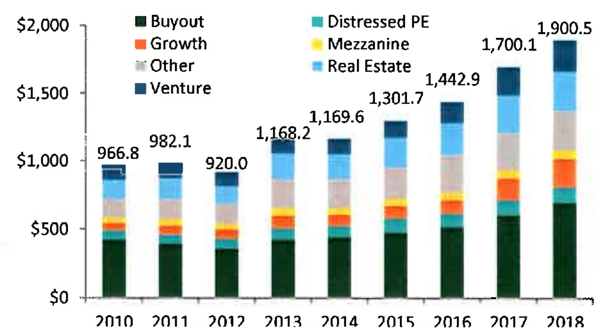


Source: Buyouts, Pitchbook & National Venture Capital Association

DRY POWDER

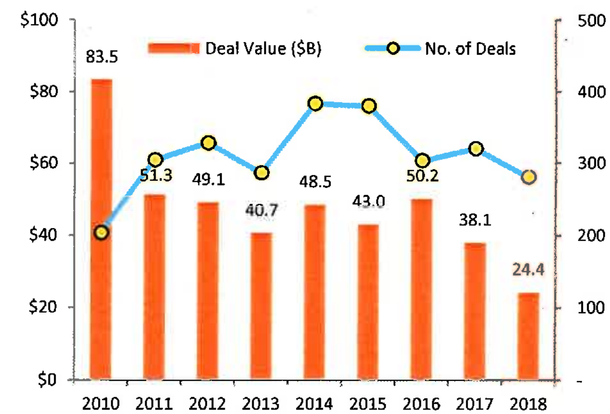
- According to *Preqin*, SoftBank Investment Advisors currently has the largest amount of dry powder at $67.0 billion, followed by the Carlyle Group with $34.6 billion and KKR with $32.2 billion as of 4Q18.
- 17 of the top 25 fund managers by dry powder are based in the U.S. (Preqin)

Global Dry Powder by Strategy | $ Billion



SECONDARY BUYOUTS

- 280 secondary buyout transactions were completed during 2018 for an aggregate deal value of $24.4 billion.



Source: Thomson Reuters, Preqin

MARKET OVERVIEW 4Q18

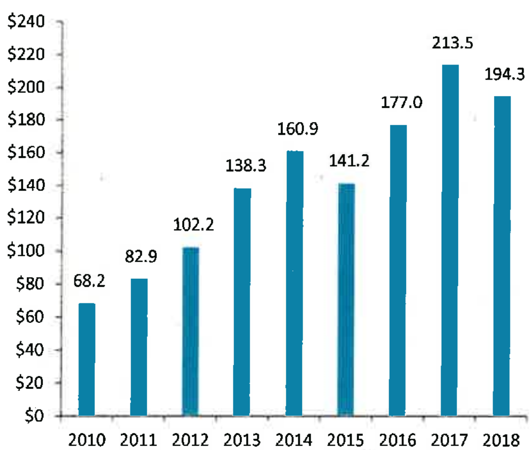
EUROPE

TorreyCove Capital Partners

FUNDRAISING

- 4Q18 commitments: $18.6 billion, representing a 3.1% increase from 3Q18 ($18.0 billion) and a 74.1% increase from 4Q17 ($10.7 billion). (Thomson Reuters)
- According to Thomson Reuters, the United Kingdom accounted for 59.3% of funds raised in Europe during 4Q18, followed by Germany (31.4%), and France (8.0%).
- The increase in funds raised during the quarter stems from an increase in fundraising in the United Kingdom, $11.0 billion compared to $10.7 billion raised in 3Q18, and Germany, $5.8 billion compared to $0.3 billion in 3Q18, offset by a decrease in Switzerland, from $4.9 billion in 3Q18 to $0.0 billion this quarter. Additionally, Italy, Belgium, and Estonia saw increased fundraising activity of $86.8 million, $112.9 million, and $24.1 million, respectively. (Thomson Reuters)
- The largest fund to achieve a final closing was Triton Fund V ($5.7 billion), a London based fund focused on the European mid-market sector, followed by ICG Europe Fund VII ($5.1 billion) and Fondi Italiani Per Le Infrastructure Fund III ($4.1 billion). (Preqin)

Europe Fundraising Activity | $ Billion

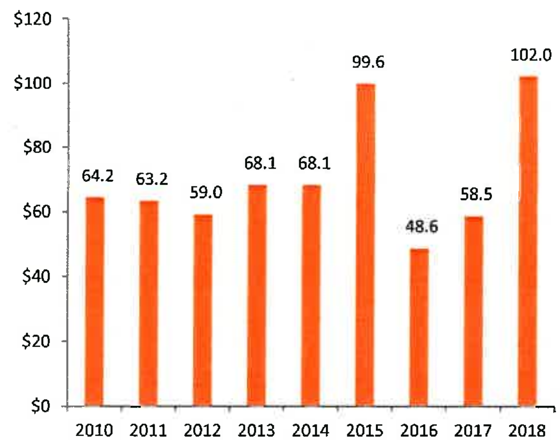


Source: Preqin

INVESTING

- Disclosed deal value totaled $25.4 billion across 420 deals in 4Q18, up 30.8% in value and down 15.5% in deal count from 3Q18. (Thomson Reuters)
- The United Kingdom accounted for 93.2% of total disclosed invested capital in Europe during 4Q18, followed by Germany and Finland with 5.9% and 0.4%, respectively. (Thomson Reuters)
- According to Thomson Reuters, the largest PE deal disclosed in Europe was Refinitiv, a U.K.-based financial markets data and infrastructure holdings company, which was acquired by Blackstone Group for $17.0 billion.
- Other notable transactions include Travelport Worldwide, a U.K. based travel commerce company, acquired by Elliot Management Corp. and Siris Capital Group ($4.4 billion) and Midlothian Capital Partners, a U.K. based provider of financial investment services, acquired by Ares Management for ($0.6 billion). (Thomson Reuters)
- The computer software industry garnered $21.5 billion of new investment in 4Q18, followed by financial services with $2.3 billion. (Thomson Reuters)

Europe Investment Activity | $ Billion

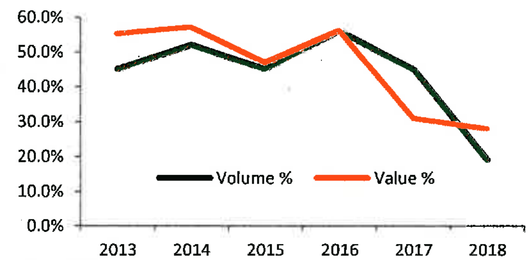


Source: Thomson Reuters

EXITS

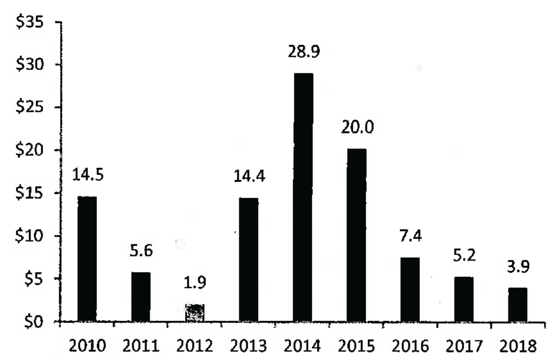
- There were three PE-backed IPOs in 4Q18 valued at $1.7 billion, up 162.4% in value and down 25.0% in count from 3Q18. The largest IPO was Aston Martin Lagonda (LON: AML), sponsored by Investidustrial Services which raised $1.4 billion from the listing. (Thomson Reuters)
- Volume of European PE-backed IPOs as a percentage of total European IPOs was 19.1% through the year, down 57.6% from 2017. Additionally, value of European PE-backed IPOs as a percentage of total value of European IPOs was 28.0%, down 9.7% from 2017. According to PWC, the slow-down in PE-backed IPO activity across Europe was due to uncertainty around the ongoing Brexit negotiations and trade between the U.S. and China. (PWC)

Europe | PE Backed IPOs as % of Total IPOs



Source: PWC

Europe IPO Exits | $ Billion



Source: Thomson Reuters

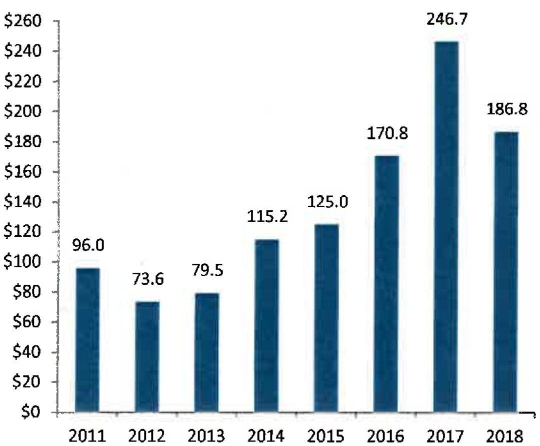
MARKET OVERVIEW 4Q18

ASIA

FUNDRAISING

- **4Q 2018 commitments:** $59.2 billion, representing a 14.9% decrease from 3Q18 ($69.5 billion) and a 30.7% increase from 4Q17 ($45.3 billion).
- China accounted for 45.5% of funds raised in Asia during 4Q18, followed by Japan (6.1%) and India (5.0%).
- The decrease in funds raised during the quarter was largely due to China, which decreased from $49.6 billion to $26.9 billion in a quarter-on-quarter basis.
- The largest PE fund to reach a final closing was PAG Asia III ($6.0 billion in total), a Hong Kong-based buyout fund sponsored by PAG Asia Capital, followed by Bain Capital Asia Fund IV ($4.0 billion) and Tiger Global Private Investment Partners XI ($3.8 billion).
- In 4Q18, Buyout/Growth was the most popular strategy in Asia accounting for 53.7% of the total, followed by Venture Capital (29.2%) and Fund of Funds (9.6%).

Asian Fundraising Activity | $ Billion

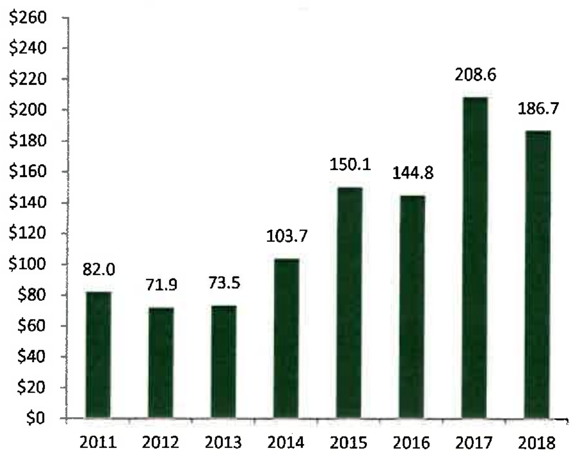


Source: AVCJ

INVESTING

- Disclosed deal value totaled $42.2 billion across 692 deals in 4Q18, down 9.2% in value, but up 0.4% in deal count compared to 3Q18.
- China accounted for 32.8% of the total investments in Asia during 4Q18, followed by South Korea and India with 29.2% and 11.0%, respectively.
- The largest disclosed PE deal in Asia was SK Shipping ($3.7 billion), a marine transport services provider in Korea, acquired by Hahn & Company. The other major deals were Beijing Byte Beating Technology, a Chinese data analysis service, acquired by a consortium including KKR Asia ($3.0 billion) and Trade Me, a New Zealand-based E-commerce platform developer acquired by Apax Partners ($1.8 billion).
- The information technology industry garnered $21.6 billion of new investment value in 4Q18, followed by the transportation and distribution industry with $5.6 billion in value.

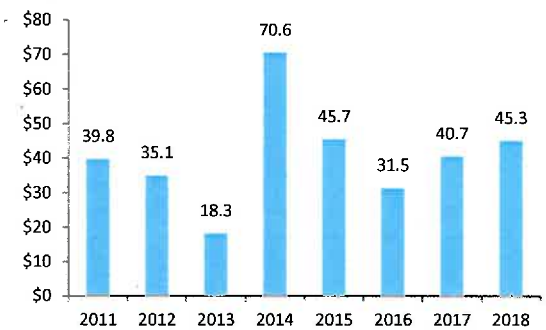
Asian Investment Activity | $ Billion



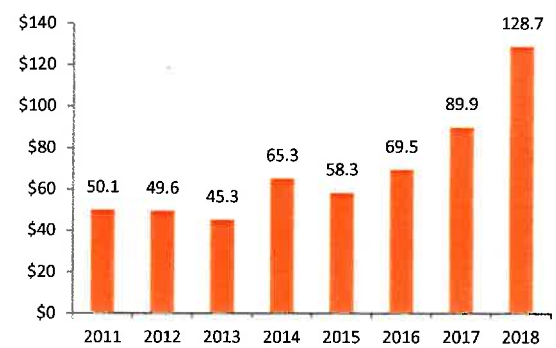
EXITS

- In Asia, there were 34 PE-backed IPOs in 4Q18 valued at $3.1 billion, down 79.6% in value and down 10.5% in count from 3Q18. The largest IPO was Shanghai Junshi Biosciences Co. (listed in Hong Kong Stock Exchange) sponsored by a consortium including Hillhouse Capital Management (raising $0.4 billion).
- There were 54 disclosed Asian PE M&A (ex-IPO) exits in 4Q18 valued at $17.8 billion, down 27.2% in value and 34.9% in count from 3Q18. South Korea was the largest market (45.5% of the total).

Asian IPO Exits | $ Billion



Asian M+A Exits | $ Billion



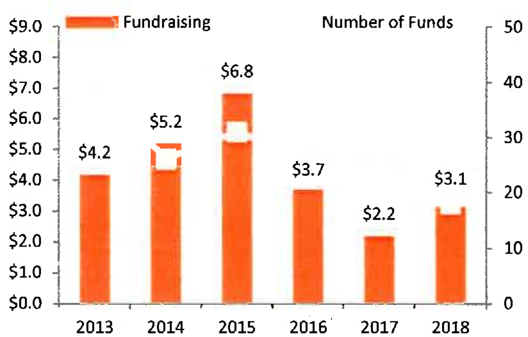
TorreyCove
CAPITAL PARTNERS

MARKET OVERVIEW 4Q18
EMERGING MARKETS: AFRICA

FUNDRAISING

- Investor enthusiasm in Sub-Saharan Africa dampened again in 2018 as the region fell to the fifth most attractive emerging market in *EMPEA's 2018 LP Survey*, down from fourth in the prior year. The survey cites currency risk and macroeconomic headwinds as the main drivers of this decline.
- According to *Preqin*, the largest African fund closed in 2018 was AP Møller Africa Infrastructure Fund I, an infrastructure fund with $1.0 billion in commitments. Out of the 18 total funds that closed in 2018, 72.2% fall under three predominant strategies: growth, venture, and infrastructure.
- African funds raised $3.1 billion in 2018, and only 36.4% of funds met their target. Fundraising increased 44.4%, up from $2.2 billion in 2017, however, the total number of funds raised decreased by 30.8% from 26 in 2017 to 18 in 2018.

African Fundraising Activity | $ Billion

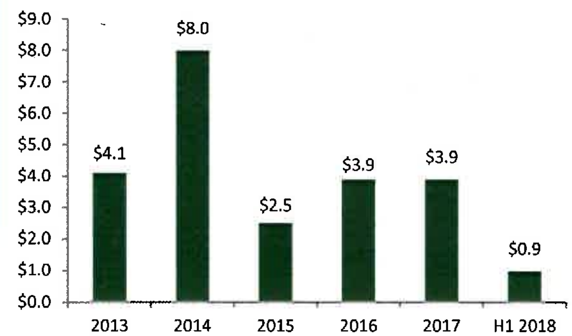


Source: Preqin

INVESTING

- According to *AVCA*, disclosed deal value in Africa totaled $0.9 billion in H1 2018 with a median deal size of $8.0 million.
- Consumer-focused sectors and financials accounted for the highest number of deals in H1 2018, while utilities was the largest sector by deal values accounting for approximately 37%, up from 3% in H1 2017. In terms of geography, West Africa and multi-region deals attracted around 46% of the total number of deals.
- According to *Preqin*, the largest disclosed PE deal in 2018 was Milost Global's $0.3 billion acquisition of Japaul Oil & Maritime Services, a Nigerian upstream service company. Another notable deal was Developmental Partners' acquisition of CMGP, an irrigation services provider based in Morocco, for $0.1 billion.

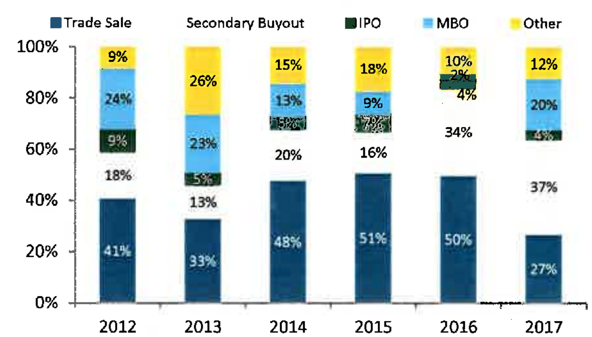
African Investment Activity | $ Billion



EXITS

- According to *EY*, exit activity remained resilient despite challenging exit conditions with 49 disclosed exits in 2017 down one from 50 exits in 2016.
- South Africa had the highest number of exits between 2016 and 2017, accounting for approximately 45% of the total number of exits, followed by North Africa and West Africa, at approximately 22% and 16%, respectively. Industrials attracted the highest number of PE exits during that same period, accounting for about 22% of total exits, followed by consumer staples at about 15% and materials at 13%.
- According to *Preqin*, the largest disclosed exit in 2018 was Isilo Capital and Milost Global's sale of Nigerian commercial real estate developer, Primewaterview, to Williamsville Sears for $1.1 billion, followed by the Carlyle Groups' $147.0 million sale of Nigerian Diamond Bank to Access Bank.

African Exit Route



SPOTLIGHT: Infrastructure

The "Africa Rising" movement created investor enthusiasm and brought large amounts of capital to Africa from 2013-2015. However, 2016 saw fundraising and enthusiasm decline as a result of currency volatility and commodity downturn in what *EMPEA's 2018 Africa* Brief refers to as the "The Aftermath of 'Africa Rising.'" *EMPEA* notes that many sectors, particularly commodities, were hurt by the economic slowdown, yet infrastructure remained resilient across both fundraising and deal flow. Approximately 50% of fundraising value from 2015-2017 had been committed to infrastructure funds, and in 2016, infrastructure investments, particularly grid-scale power generation, drove deal value to increase from prior years. According to *AVCA*, the number of private equity infrastructure deals increased 20.5% from the period between 2012-2014 to the period between 2015-2017. Investments in utilities accounted for around 53% of all deal values, while telecommunications and industrials accounted for about 24% and 13%, respectively. West and South Africa accounted for almost half of all infrastructure deals between 2012 and 2017, but *Private Equity International* notes that East Africa is also a key region for infrastructure growth, particularly in Kenya, due to the emerging middle class. According to AVCA, closing the sub-Saharan infrastructure gap would increase GDP per capita by 2.6% per year. Long-term opportunities for private capital in the sector and region will continue as Africa's governments have neither the financial resources nor experience required to close the gap themselves.

Source: AVCA

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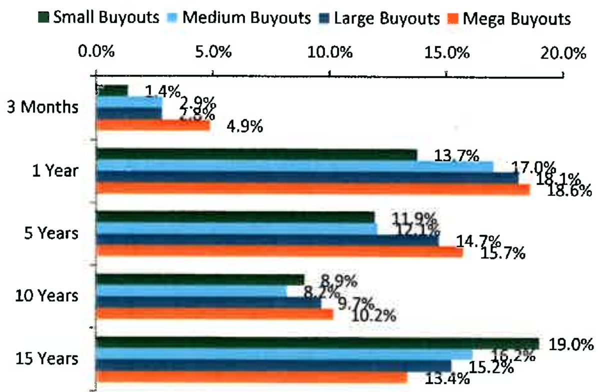
MARKET OVERVIEW 4Q18
PERFORMANCE*

*PERFORMANCE DATA MAY LAG CURRENT QUARTER DUE TO THE COMPLEX PROCESS OF DATA COLLECTION.

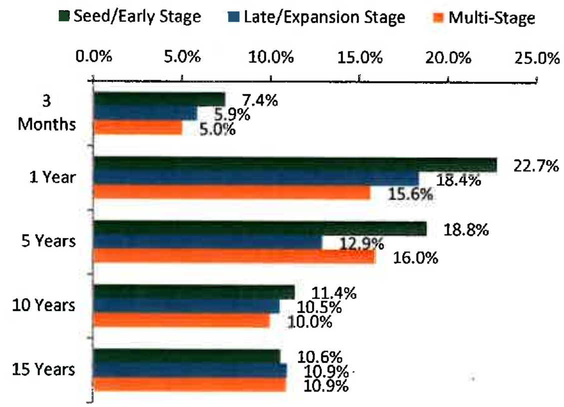
Private Equity Returns by Asset Class	5 Year	10 Year	15 Year	20 Year
Venture Capital	17.4%	10.8%	10.7%	17.8%
Growth Equity	15.0%	11.6%	13.6%	13.8%
Buyout	14.8%	9.7%	14.5%	12.2%
Subordinated Capital	10.3%	9.2%	9.8%	8.6%
Control-Oriented Distressed	10.1%	9.5%	11.1%	10.8%
Private Equity Energy	3.5%	4.8%	10.0%	9.9%
Total	13.8%	9.7%	13.2%	12.7%

Buyout Returns



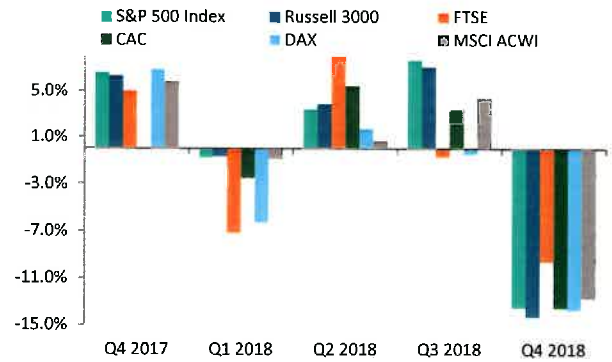
Source: Cambridge Associates as of June 30, 2018

Venture Capital Returns



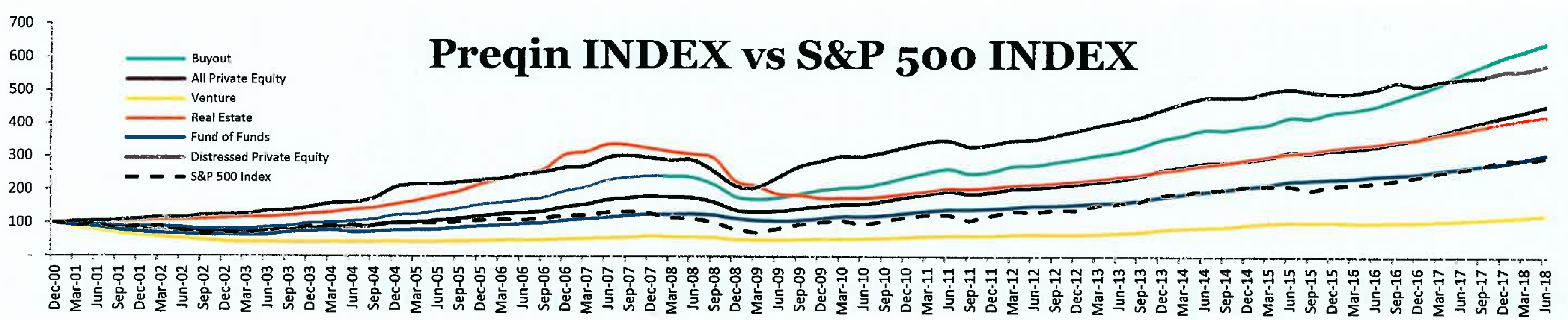
Source: Cambridge Associates as of June 30, 2018

MARKET RETURNS



Index	4Q 2017	1Q 2018	2Q 2018	3Q 2018	4Q 2018
S&P 500	6.6%	-0.8%	3.4%	7.7%	-13.5%
Russell 3000	6.3%	-0.6%	3.9%	7.1%	-14.3%
FTSE	5.0%	-7.2%	9.5%	-0.7%	-9.6%
CAC	0.0%	-2.5%	5.5%	3.4%	-13.6%
DAX	6.9%	-6.4%	1.7%	-0.5%	-13.8%
MSCI ACWI	5.8%	-0.9%	0.7%	4.4%	-12.7%

Source: Bloomberg



Source: Preqin, Cambridge Associates, Bloomberg; Russell Investment Group is the source and owner of the trademarks, service marks and copyrights related to the Russell Indexes.

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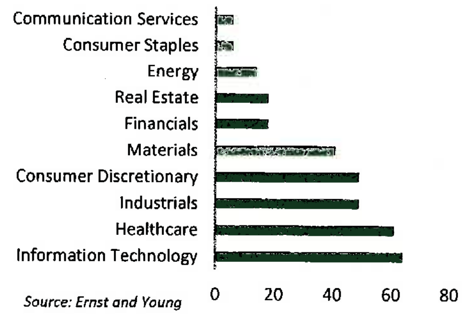
Market Overview 4Q18
Sector in Focus: HEALTH CARE

SECTOR OVERVIEW

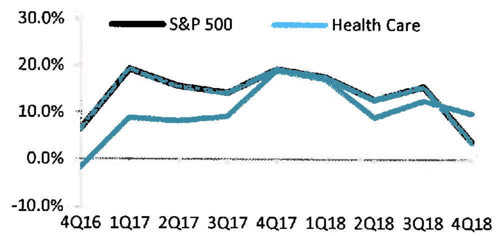
- The health care sector of the S&P 500 decreased 9.1% during 4Q18, 487 bps higher than the S&P 500 during the same period (-14.0%). The sector recorded its highest quarterly price of $1,107.3 on October 1, 2018. The sector withstood market volatility in 2018, outperforming all ten sectors represented in the S&P 500. 2018 has been favorable to the sector as health care returned 4.7%, outperforming the S&P 500 return (-6.2%) by 1,093 bps on a one-year percentage return basic. (S&P 500 Dow Jones)
- 1,420 global M&A deals were completed during 4Q18, 225 (15.8%) of which were companies within the health care sector, up 11.4% when compared to the prior-year period. Additionally, the sector accounted for 14.7% of exits during the period, up 7.2% when compared to the prior-year period. The average life of exited investments related to the sector was 4.1 years. (Preqin)
- The health care sector accounted for 61 out of 326 IPOs (18.7%) during 4Q18, which ranked 2nd across all sectors globally. Sector IPO proceeds for the quarter were $5.1 billion or 9.5% of total proceeds. *(Ernst & Young)*
- The health care sector led all sectors in beating its estimated revenue growth for 4Q18, posting 7.3% growth versus 5.8% estimate. Revenue exposure during the period was 64.0% in the United States and 36.0% internationally. Additionally, year-over-year earnings growth for the sector was 11.1%. (FactSet)

4Q18 Global IPO Activity



Source: Ernst and Young

Sector Performance | TTM Price Return

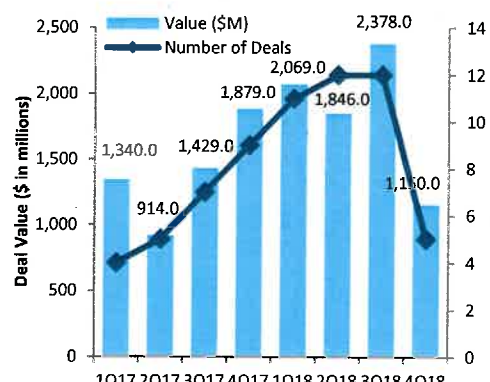


Source: S&P 500 Dow Jones

SECTOR OUTLOOK

- Medical costs are expected to grow by about 6.0% in 2019, inflated by three major factors: the increasing amount of access points for medical care, the recent megamergers of health care providers, and growing consolidation and employment of physicians. *(PwC's Health Research Institute)*
- U.S. tax reform and funds gained from divestitures increased cash available for M&A deals, but the health care sector is cautious heading into 2019 due to increasing trade tensions. *(Ernst & Young)*
- Positive factors that may affect the health care sector are increased need for services among an aging population and strong financials allowing for higher dividends, stock buybacks, and M&A deals. However, the sector is expected to face challenges from regulatory uncertainty and fiscal policy concerns. *(Charles Schwab)*
- The health care sector is expected to post revenue and earnings growth of 8.4% and 9.3%, respectively, through the first quarter of 2019. *(FactSet)*

U.S. Health Care Mega-Rounds | $100+ million



Source: PwC & CB Insights

MARKET ANALYSIS

- Digital Health Care
  - Companies in the digital health industry raised $8.6 billion in 2018, a 21.2% increase compared to the $7.1 billion raised in 2017. Deal volume saw minimal change, as 477 deals were made in 2018 compared to 476 in 2017. However, digital health funding saw a substantial drop in 4Q18, as there were only 83 deals worth $1.9 billion compared to 123 deals worth $3.1 billion closed in 3Q18. (PwC & CB Insights)
  - As clinical staffing make up the largest proportion of hospital costs, up to 70.0%, the digital health industry is automating and augmenting many tasks. The industry is expected to reach $280.0 billion by 2021, a compounded annual growth rate of 15.9% between 2016 and 2021. (Deloitte)
  - Four mega-round deals worth $1.1 billion were closed for digital health companies in 4Q18, although mega-round activity declined in the health care sector overall. U.S. health care mega-round financing raised $1.2 billion in 4Q18, down from $2.4 billion raised in 3Q18 for a 51.6% decrease. The average size of a mega-round deal was $184.0 million in 4Q18, which is 7.0% less than the $200.0 million average mega-round deal size in the past eight quarters. (PwC & CB Insights)