PENSION CONSULTING ALLIANCE

1H 2016

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM (CalPERS)

PRIVATE EQUITY PROGRAM SEMI-ANNUAL PERFORMANCE REPORT

INTRODUCTION

Private equity is a long-term asset class with performance results influenced by various factors. This report concentrates on several key exposures that contribute to performance results, including strategy, geography, structure, and vintage year. In addition, the broad industry trends highlighted herein may affect future performance results.

EXECUTIVE SUMMARY

Portfolio Highlights

- **The PE Program outperformed the Policy Benchmark over the latest 1-year period, while underperforming the Policy Benchmark over the 3-, 5- and 10-year periods.** Despite trailing the Policy Benchmark over the latest 10-year period, the PE Program's average annual return as of June 30, 2016 has exceeded CalPERS' expected return for the private equity asset class, the total fund's assumed rate of return and the peer-based State Street Private Equity Index (SSPEI)**.**

- Including a public market index in the PE Program Policy Benchmark continues to result in questions about comparable performance results, particularly over shorter time periods, though most private equity investors use this type of benchmark and PCA believes it to be reasonable in measuring long-term performance. **We generally expect private equity to underperform rising public equity markets and outperform falling ones.**

- Despite generating positive returns overall, the breadth of the decline in performance relative to the prior reporting period (2H 2015) on an absolute basis indicates **macroeconomic factors were the primary contributors, including the struggling energy sector**. In addition to energy exposure, the PE Program's **Credit Related strategies underperformed during the most recent fiscal year, as did certain large Venture Capital holdings**.

- The PE Program has been **net cash flow positive by approximately $24 billion** (i.e., distributions received exceeded capital contributions made) since 2011.

- **The performance of the portfolio is primarily driven by investments** (a) in the **Buyout** strategy, (b) in the **United States** and (c) utilizing **partnership structures**. This is true over nearly all time periods measured.

- The **PE Program's managers have approximately $13 billion of "dry powder"** (i.e., unfunded commitments to active investments), approximately half of which corresponds to commitments to investments in the 2013-2016 vintage years.

- Although the PE Program is in its 26th year, **94% of value and performance are attributable to commitments made during vintages 2006-2016.** Commitments made in the 2006-2008 vintages represent approximately 54% of aggregate net asset value.

- **The PE Program's five largest GP relationships represent 36% of net exposure**, which is defined as cost plus unfunded commitments.

Industry Trends

- **U.S. private equity fundraising had a strong first half of 2016, with an annualized pace in excess of 2015 levels.** The fundraising environment remains robust, as domestic commitments totaled approximately $140 billion. Most top performing firms have been over-subscribed in their latest offerings**.**
- **Commitments to buyout funds exceeded $100 billion,** accounting for 73% of total U.S. fundraising during the first half of 2016.
- **Risk metrics in the U.S. leveraged buyout market demonstrated slight declines in purchase price multiples** (from 10.3x in 2015 to 10.1x in the first half of 2016) and average debt multiples (from 5.7x to 5.5x).
- **U.S. purchase price multiples continue to exceed those in 2007** (i.e., at the peak immediately preceding the financial crisis) while debt multiples remain slightly below 2007 levels**.**
- Industry wide, private equity returns were lower than in previous reporting periods; this is attributable to the **struggling energy sector, declines in public market performance, and a recent slowdown in deal activity**.
- The lower 1-year returns generated by the PE Program are consistent with **declines in the SSPEI and other industry benchmarks**.
- **Venture capital deal volume remained robust, and consistent with 2015 levels**, while venture capital IPO volume modestly decreased relative to the first half of 2015**.**
- **The outlook for distressed debt investment strategies continues to be mixed**, as default rates remain very low but a turn in the cycle could materially increase the opportunity set. Leveraged loan bid levels have returned to 90% of par, after briefly dipping below 90% toward the end of 2015.
- **The S.E.C. has continued its heightened scrutiny on private equity**, particularly with respect to general partners' fee and expense allocation practices and conflicts of interest.
- The issuance of **ILPA Quarterly Reporting Standards and Reporting Template** have been positive steps overall, though the level of adherence by managers to the new guidelines is still being assessed.

OVERALL PRIVATE EQUITY PROGRAM PERFORMANCE

Performance vs. Policy Benchmarks

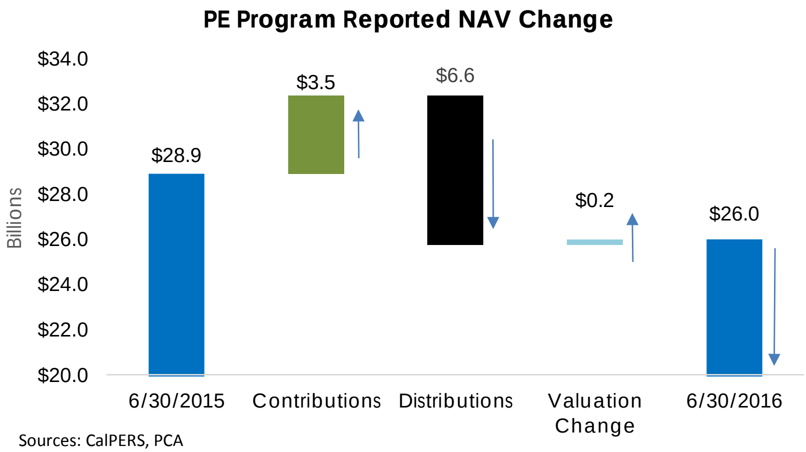
	1-Year	3-Year	5-Year	10-Year
CalPERS' PE Program[1]	**1.7%**	**10.0%**	**9.7%**	**10.2%**
PE Program Policy Benchmark[2]	*(0.8%)*	*10.8%*	*10.6%*	*12.7%*
Pro Forma Current Policy Benchmark	*(0.8%)*	*10.8%*	*10.4%*	*8.5%*
State Street Private Equity Index (SSPEI)[3]	*4.6%*	*10.1%*	*9.3%*	*9.3%*
Excess Return				
v. Policy Benchmark	*2.5%*	*(0.8%)*	*(0.9%)*	*(2.5%)*
v. Pro Forma Current Policy Benchmark	*2.5%*	*(0.8%)*	*(0.7%)*	*1.7%*
v. SSPEI	*(2.9%)*	*(0.1%)*	*0.4%*	*0.9%*

Source: Wilshire Associates, State Street, CalPERS, PCA

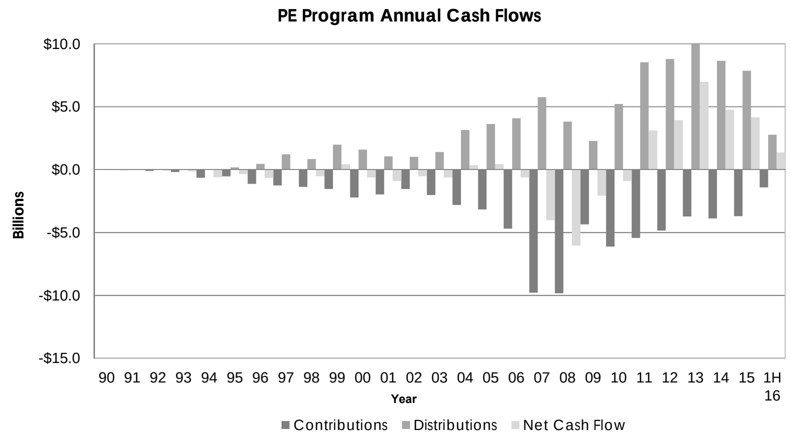
- PE Program represents 8.9% of the total portfolio, 1.1% below the interim target of 10% and 3.6% below the long-term target of 12%.
- The Program outperformed the Policy Benchmark by 2.5% over the latest year, largely attributable to declining public markets.
- The 1-year return of 1.7%, down from 5.5% as of December 31, 2015, is generally reflective of broader market movements as the SSPEI also experienced a decline between September 30, 2015 and March 31, 2016.
- Over the 10-year period, the PE Program underperformed the Policy Benchmark by 2.5% despite generating a 10.2% annual return.
- The PE Program outperformed the State Street Private Equity Index (a peer based, industry benchmark) over the 5- and 10-year time periods, while underperforming the SSPEI over the more recent 1- and 3-year periods.
- If the current public market-linked component of the Policy Benchmark had been used throughout, the PE Program would have generated long-term outperformance of 170 bps over the 10-year period. The "Policy Benchmark" as used herein is comprised of a blend of the three benchmarks that have been in effect at various times throughout the last decade.
- The PE Program has exceeded the expected return for the asset class (9.3%) and the total fund's actuarial rate of return (7.5%) over the 3-, 5- and 10-year periods. Given the long term nature of private equity, the longer term results are more instructive in analyzing overall performance than is the 1-year return.

[1] The net asset value of CalPERS' PE Program portfolio is lagged one quarter with adjustments for current cash flows through the reporting period.
[2] Currently equals (67% FTSE US TMI + 33% FTSE AW x-US TMI) + 3% 1-quarter lagged from and since September 2011; previous benchmark was the Wilshire 2500 ex-tob + 3% between July 2009 and August 2011. Prior to July 2009 the PE Program Policy Index was linked historically to the Custom Young Fund Index.
[3] Time-weighted return calculated by linking quarterly return, 1-quarter lagged.

NET ASSET VALUE CHANGE AND CASH FLOWS



Sources: CalPERS, PCA

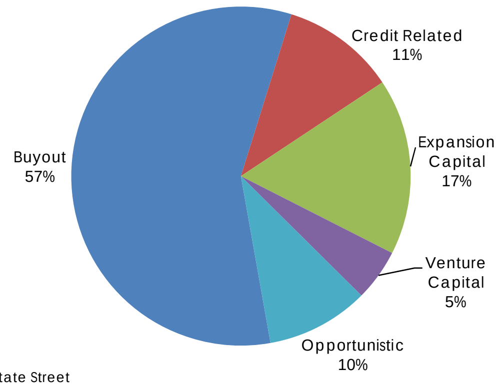


Sources: CalPERS, PCA

- The PE Program's net asset value (NAV) decreased by $2.9 billion in fiscal 2016 due to $6.6 billion of distributions of capital from managers, which in total exceeded contributions of $3.5 billion. Net cash flow was $3.1 billion for fiscal 2016.
- Net cash flow in the first half of 2016 was $1.4 billion; the PE Program has been cash flow positive every year since 2011.
- Over the three fiscal year period ending June 30, 2016, the PE Program received $24.8 billion in distributions while contributing $11.0 billion, resulting in a positive net cash flow of $13.8 billion.
- Distributions from managers have been high due to an attractive exit market as demonstrated by the persistence of elevated purchase price multiples and availability of credit, particularly in the large buyout sector.
- CalPERS executed secondary sales during the fiscal year resulting in the disposition of 46 fund positions with 24 managers, representing over $2.0 billion in capital commitments. This transaction generated gross sale proceeds of approximately $450 million.

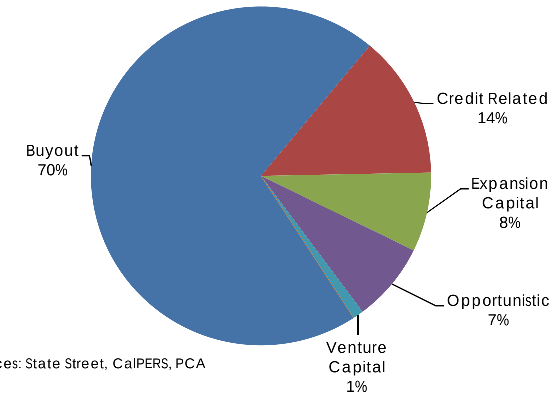
PORTFOLIO STRATEGY COMPOSITION

PE Program NAV by Strategy: $26.0 B



Source: State Street

PE Program Unfunded Commitments by Strategy: $13.2 B



Sources: State Street, CalPERS, PCA

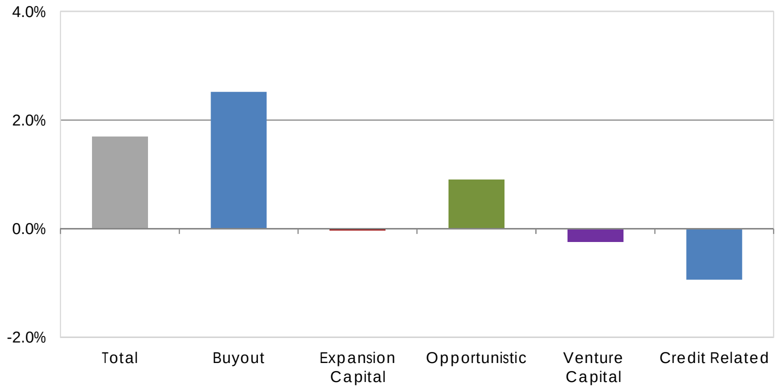
Target Strategy Allocations

Strategy	Target	Range	Actual
Buyout	60%	50%-70%	57%
Credit Related	15%	10%-25%	11%
Venture Capital	1%	0%-7%	5%
Growth/Expansion	15%	5%-20%	17%
Opportunistic	10%	0%-15%	10%

- All strategy allocations are within target ranges.
- The Buyout strategy represents the greatest proportion of the PE Program's unfunded commitments and will therefore continue to be its largest exposure prospectively, which is consistent with the overall private equity opportunity set.
- Venture Capital, which comprises 5% of the PE Program's overall NAV, represents 1% of unfunded commitments, demonstrating the PE Program's pivot from this strategy in recent years.
- The PE Program currently owns interests in over 6,000 portfolio companies, led by investments in the consumer discretionary, financials, information technology, healthcare, industrials, and energy sectors.

PORTFOLIO STRATEGY PERFORMANCE

PE Program One-Year Return Contribution* by Strategy



* Sector return weighted by proportion of NAV.
Source: State Street, PCA

Performance Summary: by strategy

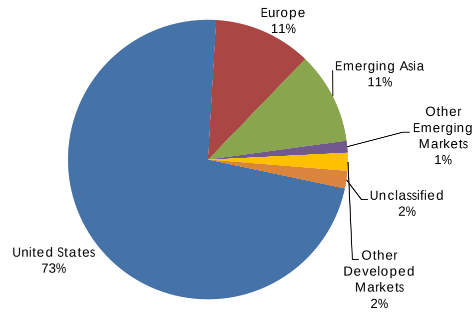
	1 Year	3 Year	5 Year	10 Year
PE Program	**1.7%**	**10.0%**	**9.7%**	**10.2%**
Buyout	*4.4%*	*11.0%*	*10.6%*	*11.2%*
Credit Related	*(8.6%)*	*3.7%*	*7.7%*	*10.7%*
Expansion Capital	*(0.2%)*	*10.4%*	*9.0%*	*8.3%*
Venture Capital	*(4.9%)*	*8.9%*	*7.0%*	*5.6%*
Opportunistic	*9.3%*	*12.3%*	*8.7%*	*6.1%*

Sources: Wilshire, State Street

- Three strategies (Credit Related, Venture Capital and Expansion Capital) produced negative returns for the 1-year period ending June 30, 2016. None of the five strategies have produced negative returns over the 3-, 5- or 10-year time periods.
- Eleven of the PE Program's 15 largest Credit Related investments posted negative 1-year returns, eight of which declined by more than 10%.
- Within the Credit Related strategy, control and non-control distressed sub-strategies have underperformed.
- The Expansion Capital portfolio lagged due to energy exposure (natural resources and clean/renewable) and the underperformance of certain large investments in the financial services sector.
- All strategies have demonstrated volatility over the time periods measured, with Credit Related and Venture Capital having the largest ranges of performance, while Opportunistic and Buyout have generated more consistent long term performance.
- The largest contributor to overall performance was the Buyout strategy, which represents 57% of the PE Program's NAV. The Buyout strategy has generated attractive results over the longer 10-year period, posting an average annual return of 11.2%.
- The PE Program's two largest strategies, Buyout and Credit Related, have also been the best performing over the 10-year period. These two strategies, in aggregate, represent more than two-thirds of the PE Program's net asset value.
- Venture Capital, the PE Program's smallest strategy, has also been its lowest performing over the 5- and 10-year periods.

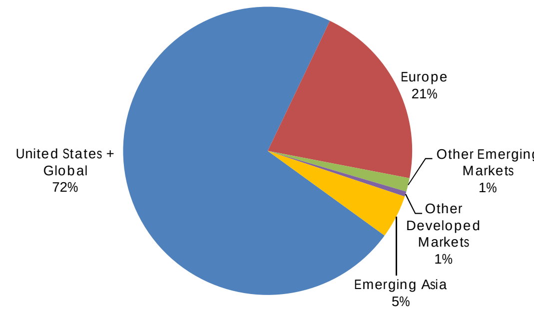
PORTFOLIO GEOGRAPHIC COMPOSITION AND PERFORMANCE

PE Program NAV by Geography: $26.0 B



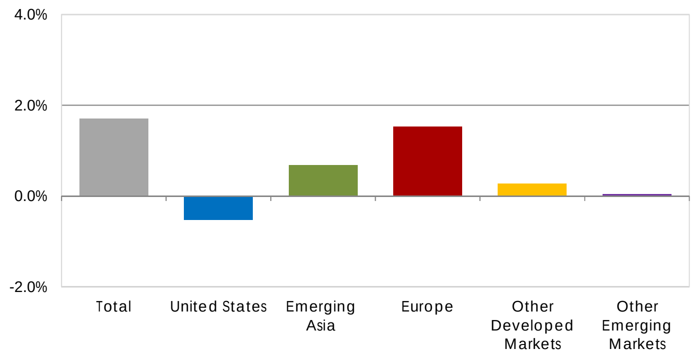
Source: State Street, PCA

PE Program Unfunded Commitments by Geography: $13.2 B



Sources: State Street, CalPERS, PCA

PE Program One-Year Return Contribution* by Geography



* Geographic return weighted by proportion of NAV.
Source: State Street, PCA

Performance Summary: by geography

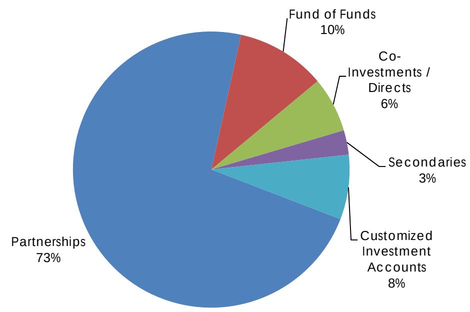
	1 Year	3 Year	5 Year	10 Year
PE Program	1.7%	10.0%	9.7%	10.2%
United States	*(0.7%)*	*9.0%*	*9.7%*	*9.8%*
International-Developed World	*13.0%*	*14.4%*	*10.9%*	*11.7%*
International-Emerging Markets	*6.1%*	*12.3%*	*9.6%*	*12.2%*

Sources: Wilshire, State Street

- Performance results were positive in all geographic sectors (based on each underlying investment's geographic mandate) over all time periods, except the 1-year performance of the PE Program's domestic holdings.
- The predominance of domestic investments in the portfolio closely links the overall PE Program's performance to its U.S. holdings; over the most recent 1-year period, several large U.S. positions declined in value.
- The decline in the U.S. holdings is largely attributable to the underperformance of domestic energy investments.
- Over the longer 3-, 5- and 10-year time periods, performance across geographic regions has been generally consistent, although investments in the Developed World, a majority of which is attributable to the PE Program's European holdings, have generated the strongest overall performance.
- The PE Program's only meaningful non-U.S. dollar exposure is in the Euro, which currently represents 9% of NAV.

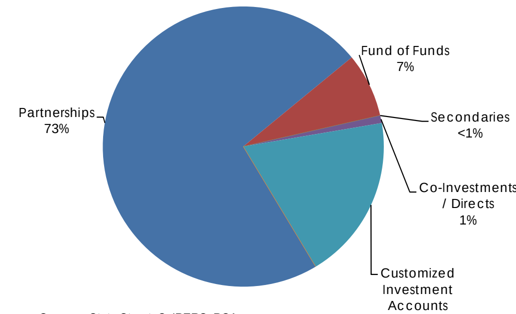
PORTFOLIO STRUCTURE COMPOSITION AND PERFORMANCE

PE Program NAV by Structure: $26.0 B



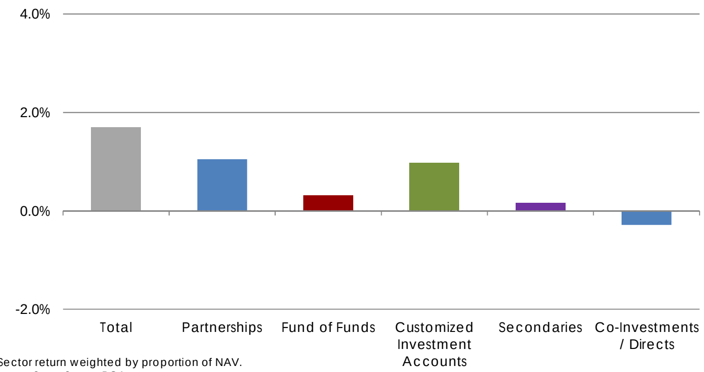
Source: State Street

PE Program Unfunded Commitments by Structure: $13.2 B



Sources: State Street, CalPERS, PCA

PE Program One-Year Return Contribution* by Structure



* Sector return weighted by proportion of NAV.
Source: State Street, PCA

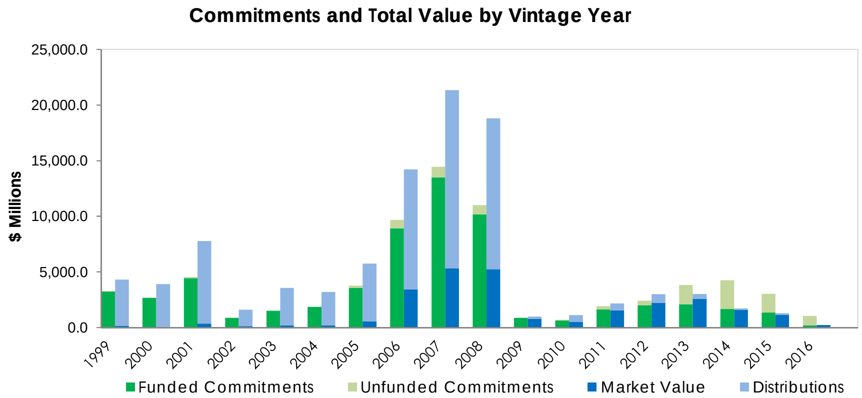
Performance Summary: by structure

	1 Year	3 Year	5 Year	10 Year
PE Program	**1.7%**	**10.0%**	**9.7%**	**10.2%**
Partnerships	*1.4%*	*9.5%*	*9.9%*	*10.2%*
Customized Investment Accounts	*12.9%*	*14.2%*	*8.4%*	*4.1%*
Fund of Funds	*3.0%*	*13.5%*	*10.4%*	*7.6%*
Co-Investments/Directs	*(4.4%)*	*3.3%*	*(4.1%)*	*1.8%*
Secondaries	*5.6%*	*39.6%*	*24.4%*	*10.9%*

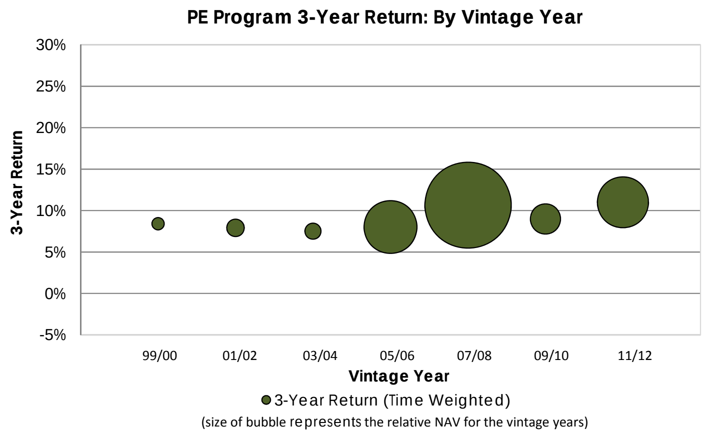
Sources: Wilshire, State Street

- Customized Investment Accounts, an area of focus for the PE Program in recent years, have performed well over the 1- and 3-year time periods. Co-investments and direct investments have lagged the overall portfolio over all time periods.
- Performance results are net positive across all structures over the latest year with the exception of Co-Investments/Directs, which declined by 4.4% over the 1-year period, primarily attributed to the continued underperformance of large direct investments.
- Over 90% of all unfunded commitments have been attributed to Partnerships or Customized Investment Accounts, demonstrating the PE Program’s emphasis on these structures in recent years.
- Co-investments and Secondaries, though representing approximately 9% of the PE Program’s NAV, comprise only 1% of unfunded commitments, due to the fact that transactions in these segments are frequently funded (or substantially funded) upon closing.
- Funds of funds underperformed over the latest year relative to the prior period, primarily due to emerging market exposure.
- Partnership investments have been and will continue to be the largest contributor to performance over all time periods.

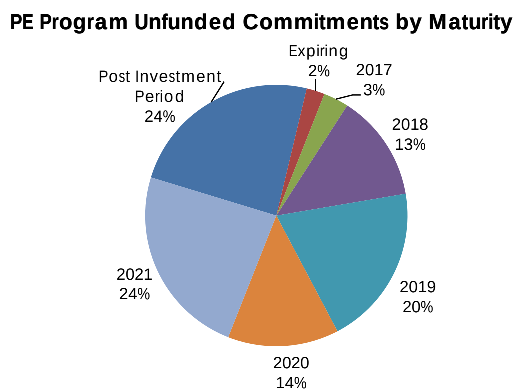
PORTFOLIO VINTAGE YEAR COMPOSITION AND PERFORMANCE



Sources: CalPERS, PCA



Sources: CalPERS, State Street, PCA



Source: State Street, CalPERS, PCA

- The Program currently has $59.4 billion in active commitments[4], $13.2 billion of active and authorized unfunded commitments, $26.0 billion in NAV and $40.5 billion in net exposure (cost + unfunded commitments).
- Approximately 50% of active commitments and 53% of NAV are currently represented by the 2006-2008 vintage years at $30.1 billion and $14.0 billion, respectively. Over this period, the PE Program invested in 174 opportunities, of which 126 remain active.
- Near-term expirations are smaller due to slower commitment activity between 2009 and 2011. Recent commitment activity has increased the longer-dated expirations. Post-financial crisis commitments are increasingly contributing to the PE Program's performance, as the bubble chart above demonstrates.

[4] Active commitments only include commitments that have drawn capital as of the reporting date.

ANNUAL COMMITMENT ACTIVITY AND MANAGER CONCENTRATION

PE Program Commitment Activity: fiscal year 2015/2016

Partnership/Firm	Commitment ($M)	Sector	Relationship
Advent International GPE VIII	500	Buyout	Existing
Ares Corporate Opportunities Fund V	425	Buyout	Existing
Blackstone Capital Partners Co-Investment	76	Buyout	Existing
Blackstone Tactical Opportunities Kensington Add-on Co-Investment	54	Buyout	Existing
Blackstone Tactical Opportunities Rothesay Co-Investment	25	Opportunistic	Existing
Bridgepoint Development Capital III and Co-Investments	173	Buyout	Existing
Bridgepoint Secondary Purchases	100	Buyout	Existing
Carlyle Havasu Co-Investment	75	Buyout	Existing
Carlyle U.S. Equity Opportunities II	200	Buyout	Existing
Cerberus Avon Co-Investment	50	Opportunistic	Existing
Cerberus Call II Partners	500	Buyout	Existing
Clearlake Capital Partners IV	57	Buyout	Existing
Clearlake Opportunities Partners I	57	Opportunistic	Existing
CVC Compounding Capital	1,000	Buyout	Existing
GSO Energy Partners II	250	Credit Related	Existing
PAG Cushman Co-Investment	61	Buyout	Existing
Stonepoint/Trident Alliant Co-Investment	63	Buyout	Existing
Towerbrook Structured Opportunities Fund	250	Opportunistic	Existing
Total	**$3,916**		

Source: CalPERS, PCA

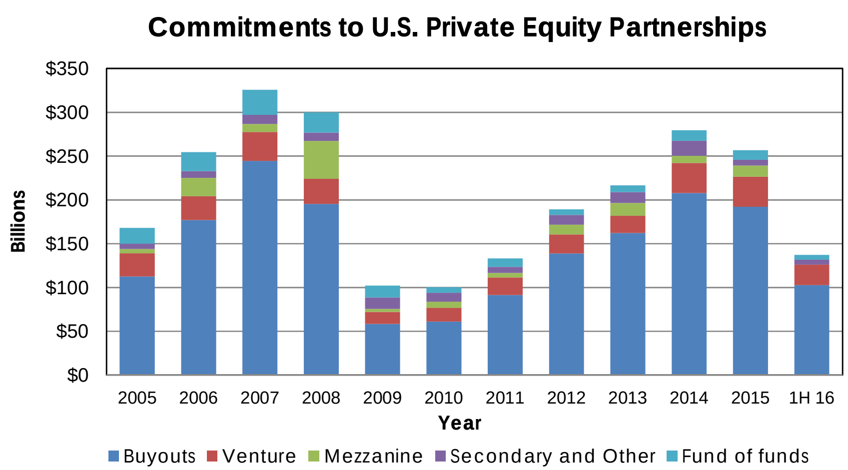
Largest PE Program Relationships by Net Exposure

Firm	Active Investments	Net Exposure ($M)	% of Program
The Blackstone Group	21	$4,633	12%
The Carlyle Group	27	$3,107	8%
CVC Capital Partners	9	$2,472	6%
Apollo Global Management	12	$2,217	6%
TPG Capital	12	$1,746	4%

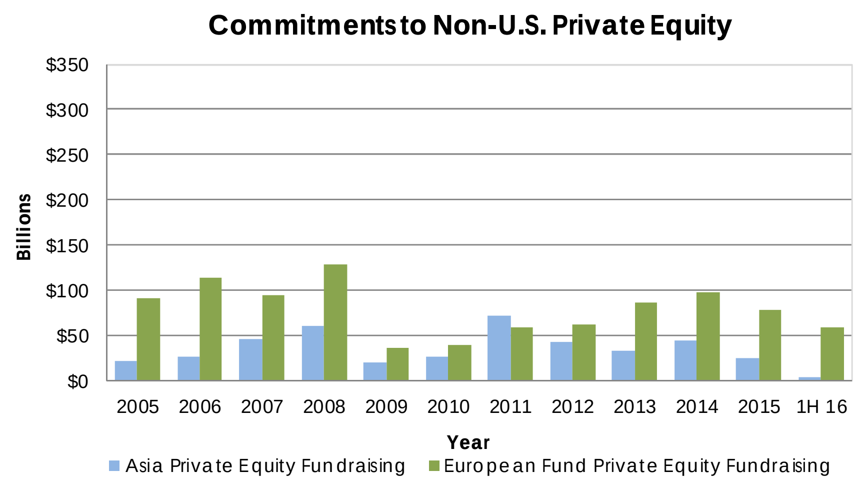
Source: CalPERS, PCA

- The PE Program authorized capital commitments totaling approximately $3.9 billion across 18 opportunities with 12 different managers during the 2015-2016 fiscal year.
- Each of the investments made during the fiscal year was with an existing manager in the portfolio.
- The PE Program's five largest relationships, based on net exposure (defined as cost plus unfunded commitments), represent, in aggregate, approximately 36% of the program's overall net exposure, across over 80 active investments, with capital allocated to multiple strategies, structures and geographies.

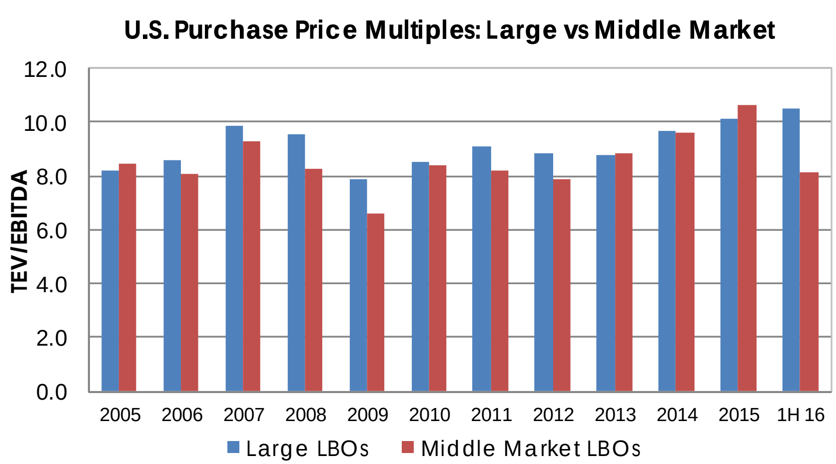
PRIVATE EQUITY MARKET OVERVIEW



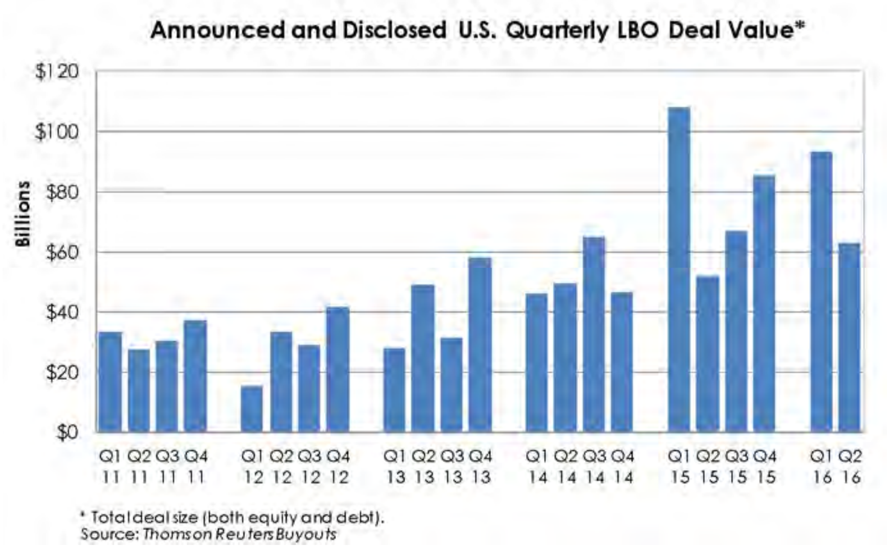
Source: *Private Equity Analyst* through June 2016

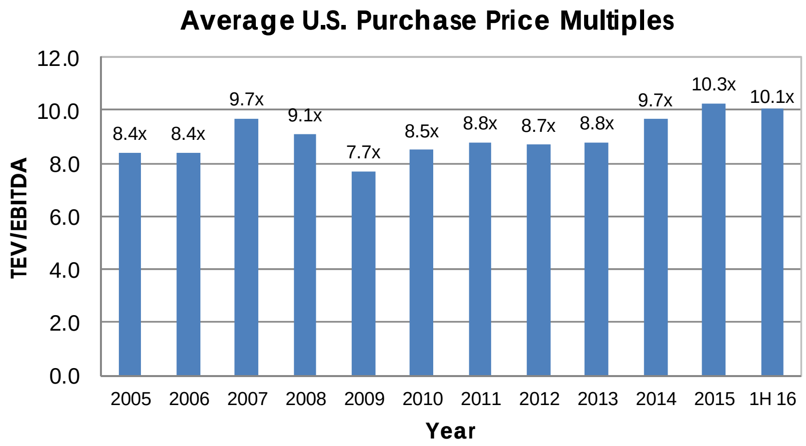


Source: Thomson Reuters, through March 2016

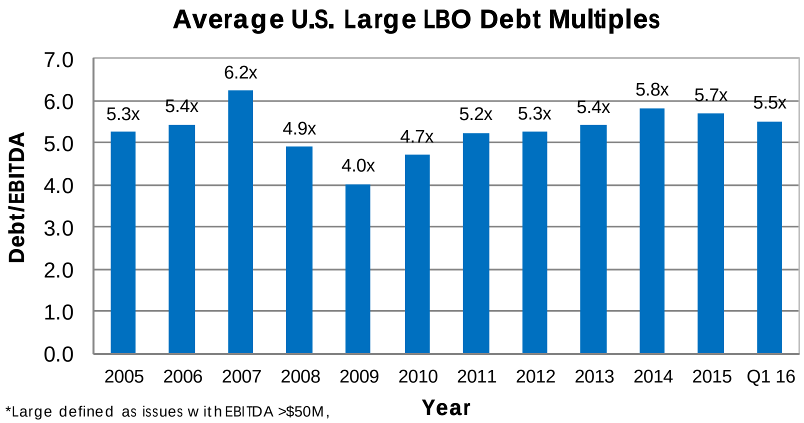


Source: S&P Capital IQ

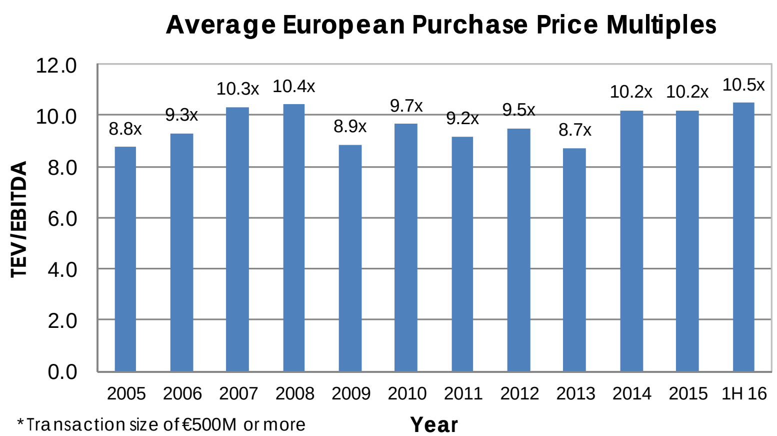




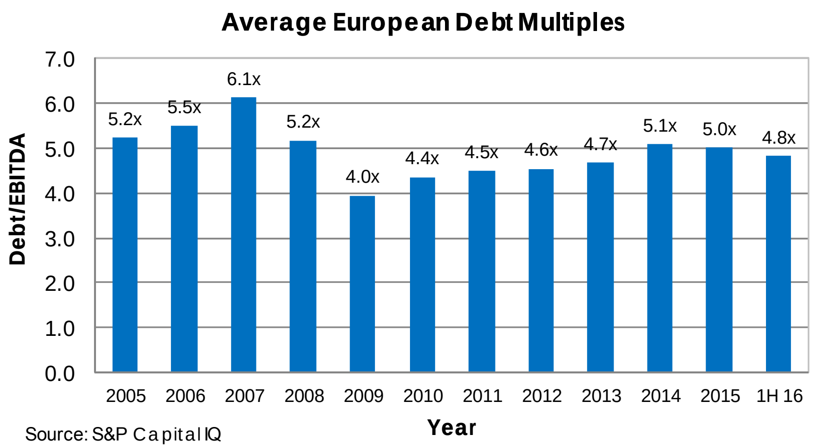
Source: S&P Capital IQ



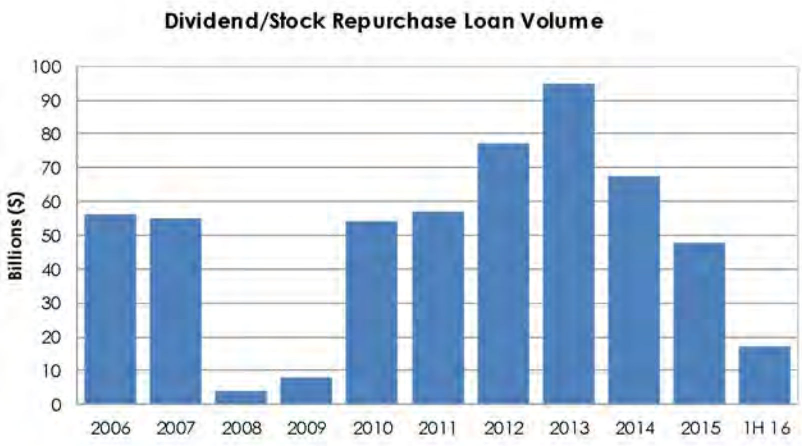
*Large defined as issues with EBITDA >$50M,
Source: S&P Capital IQ



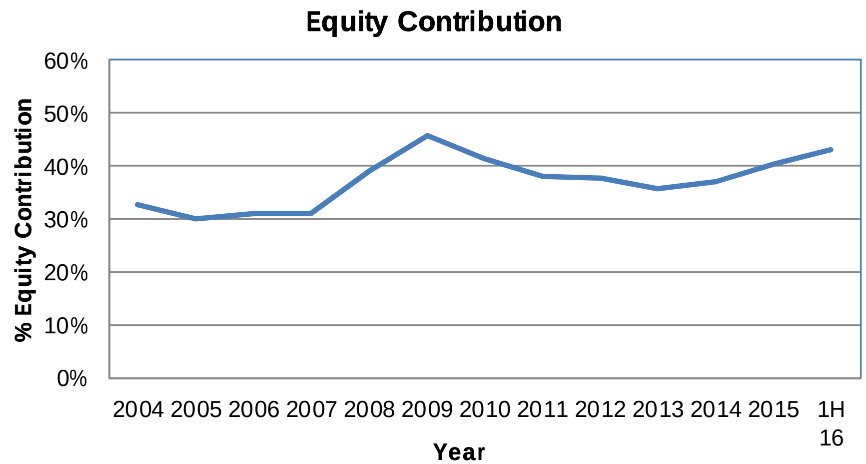
*Transaction size of €500M or more
Source: S&P Capital IQ



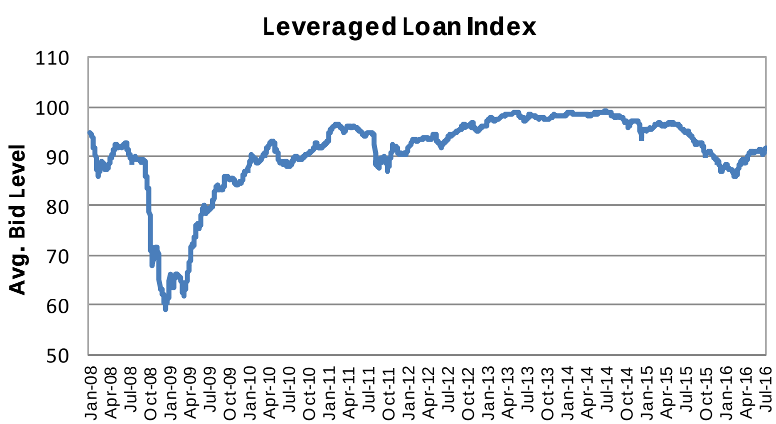
Source: S&P Capital IQ



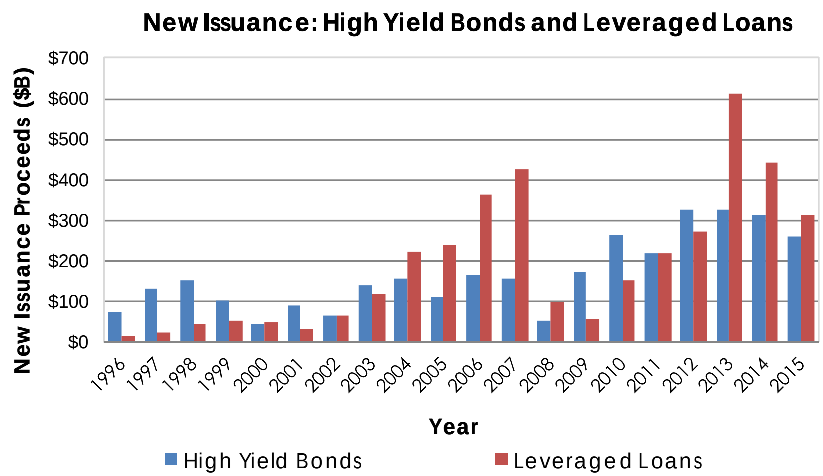
Source: S&P CapitalIQ LCD, Bank of America Merrill Lynch



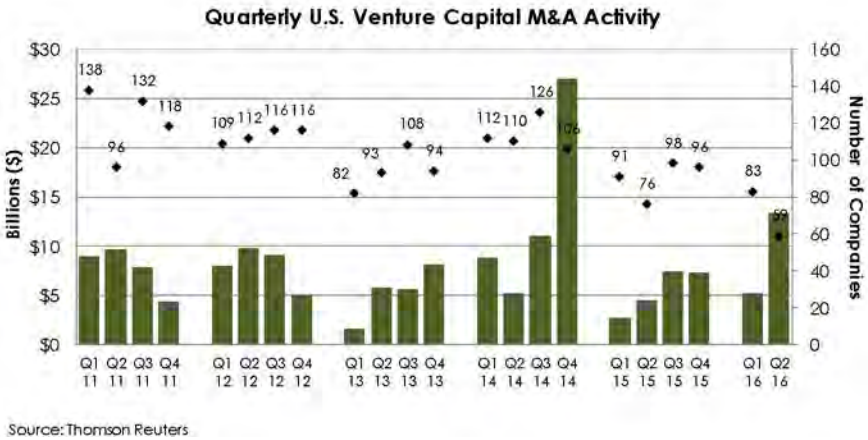
Source: S&P CapitalIQ



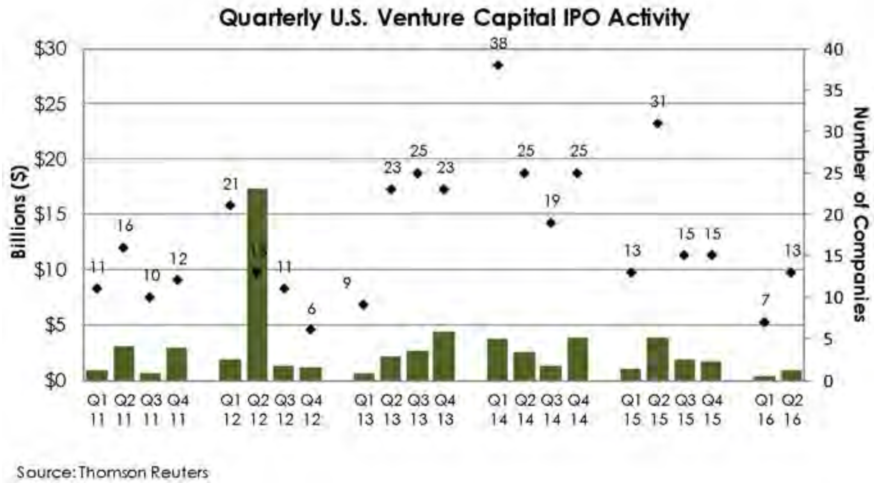
Source: Loan Syndications and Trading Association (LSTA)



Source: UBS Capital Markets, Credit Suisse Leveraged Finane Strategy, GLC



Quarterly U.S. Venture Capital M&A Activity
Billions ($)
Number of Companies
Source: Thomson Reuters



Quarterly U.S. Venture Capital IPO Activity
Billions ($)
Number of Companies
Source: Thomson Reuters

Quarterly U.S. Venture Capital Deal Volume*
Billions ($)
Number of Companies
* Only includes equity portion of deal value.
Source: Thomson Reuters

Appendix 1: PE Program Relationships by Net Exposure (Cost plus Unfunded Commitments)

Firm	Net Exposure ($M)	% of Program	Firm (continued)	Net Exposure ($M)	% of Program
Blackstone Group	4,633	12%	Birch Hill Equity Partners	208	1%
The Carlyle Group	3,107	8%	CDH Ventures Partners	196	<1%
CVC Capital Partners	2,472	6%	Green Equity Investors	190	<1%
Apollo Global Management LLC	2,217	6%	Madison Dearborn Partners	187	<1%
TPG Capital	1,746	4%	Wellspring Capital Management	182	<1%
Grove Street	1,699	4%	Jasper Ridge Partners	175	<1%
KKR & Co.	1,563	4%	Levine Leichtman Capital Partners	172	<1%
Riverstone Holdings	1,291	3%	SAIF Partners	166	<1%
First Reserve	1,125	3%	Clearlake Capital Group	163	<1%
Cerberus Capital Management	1,032	3%	Arclight Capital Partners	157	<1%
GCM Grosvenor	1,027	3%	Centerbridge Partners	151	<1%
Bridgepoint Capital	992	3%	Patria Investimentos S.A.	150	<1%
Hellman & Friedman Capital Partners	955	2%	Palladium Equity Partners	150	<1%
TowerBrook Capital Partners	936	2%	Polish Enterprise	145	<1%
Silver Lake Partners	904	2%	The Jordon Company	139	<1%
Advent International	897	2%	Aisling Capital	139	<1%
Yucaipa Companies	683	2%	THL Equity Advisors	137	<1%
57 Stars	659	2%	PAG	132	<1%
Welsh, Carson, Anderson & Stowe	594	2%	KPS Capital Partners	129	<1%
Insight Capital	575	1%	Lion Capital	126	<1%
Sankaty Advisors	500	1%	Oaktree Capital Management	121	<1%
Standard Life	470	1%	Lime Rock Partners	120	<1%
Capital Dynamics	434	1%	VantagePoint Venture Partners	117	<1%
Onex Corporation	397	1%	Coller Capital	113	<1%
Permira	383	1%	Essex Woodlands Health Ventures	102	<1%
Hamilton Lane Advisors, L.L.C.	362	1%	W Capital Partners	99	<1%
KMCP	351	1%	Riverwood Capital, LLC	91	<1%
Ares Management LLC	331	1%	Affinity Equity Partners	88	<1%
MHR Fund Management	319	1%	Triton Managers	86	<1%
Stonepoint Capital	319	1%	Avenue Capital Group	86	<1%
New Mountain Capital, LLC	288	1%	EM Alternatives	82	<1%
Asia Alternative Assets	278	1%	Rhone Partners	81	<1%
Providence Equity Partners	272	1%	Baring	81	<1%
WL Ross & Co	269	1%	Vicente Capital	76	<1%
Tailwind Capital	251	1%	Clarus Ventures	76	<1%
Goldberg Lindsay & Co. LLC	250	1%	Siris Capital Group	75	<1%
Oak Hill Capital Partners	241	1%	Sageview Capital, LLC	73	<1%
GSO Capital Partners	216	1%	Aberdare	63	<1%
Khosla Ventures	212	1%	Richardson Financial Group	58	<1%
Francisco Partners	210	1%	OTHER	512	1%

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