



## Annual Board Update

For the period ending December 31, 2019

Report Prepared For:



# Table of Contents

I.	Overview .....	1
	Portfolio Performance Assessment .....	1
	Portfolio Performance vs. Benchmarks .....	2
II.	Market Overview .....	3
	Executive Summary .....	3
	Capital Markets Overview .....	5
	Public Equity Markets .....	5
	Debt Markets .....	7
	Private Equity Market Overview .....	8
	All Private Equity .....	8
	Fundraising .....	8
	Investment Activity .....	9
	Deal Environment .....	10
III.	SERS Portfolio Review .....	11
	Summary .....	11
	New Investment Commitments .....	11
	Subsequent Investment Commitments .....	11
	Performance .....	12
	Quarterly Performance .....	12
	Diversification .....	14
	Core Portfolio Periodic Returns vs. Russell 3000® Index .....	14
	Performance by Sector .....	14
	Portfolio Cash Flow Analysis .....	15
	Subsequent Cash Flow Activity .....	18
IV.	End Notes .....	19
V.	Exhibits .....	20
	Exhibit A – Investments by Vintage Year .....	21
	Exhibit B – Investments by Sector .....	31
VI.	Definitions .....	44

**Disclaimer on this Page - Redacted**

## I. Overview

StepStone Group LP (“StepStone”) was engaged by Pennsylvania State Employees’ Retirement System (“SERS”) to provide Private Equity Advisory services for prospective investment opportunities as well as portfolio monitoring and reporting. StepStone monitors new and existing private equity investments for SERS at both the fund level and underlying portfolio company level to provide detailed performance and exposure analysis. The following report represents SERS’ portfolio of Private Investments (the “Portfolio”).

Since inception through December 31, 2019, SERS has committed \$13.6 billion to 319 partnerships, of which 179 are active. This quarterly monitoring report covers the performance of the Portfolio as of December 31, 2019, as well as significant activity that occurred during the first quarter of 2020. Natural Resource partnerships are included in Buyout as of July 1, 2016. SERS consolidated 163 Fund investments under Keystone Legacy Fund as of July 1, 2018.

### Portfolio Performance Assessment

As of December 31, 2019, the Portfolio managed by SERS consisted of the following (all amounts herein \$ millions unless otherwise noted):

SERS PORTFOLIO PERFORMANCE OVERVIEW						
<i>\$ in millions</i>	DECEMBER 31, 2019	SEPTEMBER 30, 2019	DECEMBER 31, 2018	QUARTERLY Δ	ANNUAL Δ	
Number of Managers	114	113	113	1	1	
Number of Investments	319	314	307	5	12	
Number of Active Managers	62	62	62	-	-	
Number of Active Investments	179	174	167	5	12	
Committed Capital <sup>1</sup>	\$13,553.9	\$13,218.9	\$12,697.7	\$335.0	\$856.2	
Contributed Capital <sup>2</sup>	16,661.0	16,468.4	15,999.3	192.6	661.7	
Distributed Capital <sup>3</sup>	22,684.7	22,434.7	21,714.8	250.0	969.9	
Market Value	4,007.0	3,906.1	3,791.1	100.9	215.9	
Total Value	26,691.7	26,340.8	25,505.9	350.9	1,185.8	
Unfunded Commitment	2,653.6	2,513.4	2,403.3	140.2	250.3	
Total Exposure <sup>4</sup>	6,660.6	6,419.5	6,194.4	241.2	466.3	
<b>Total Gain/(Loss)</b>	<b>\$10,030.7</b>	<b>\$9,872.4</b>	<b>\$9,506.6</b>	<b>\$158.3</b>	<b>\$524.1</b>	
DPI <sup>5</sup>	1.36x	1.36x	1.36x	(0.00x)	0.00x	
TVM <sup>6</sup>	1.60x	1.60x	1.59x	0.00x	0.01x	
IRR <sup>7</sup>	12.23%	12.21%	12.20%	+2 bps	+3 bps	

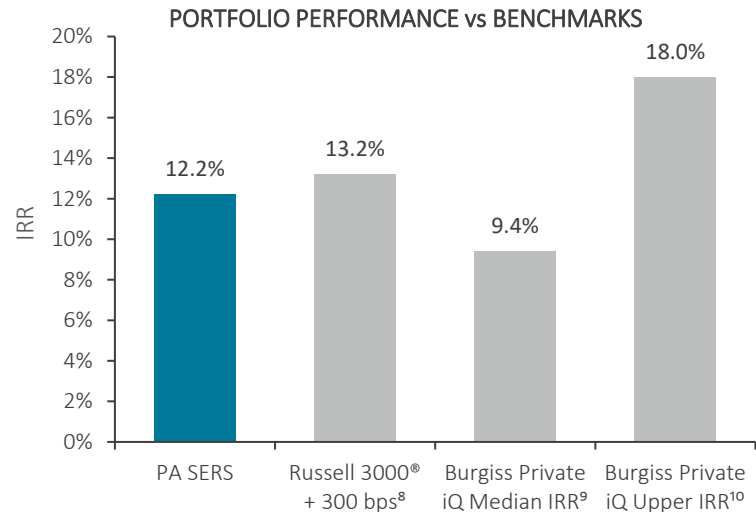
Note: Portfolio excludes T.Rowe Price Stock Distribution Account. **Past performance is not necessarily indicative of future results** and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

## Portfolio Performance vs. Benchmarks

The Portfolio's performance is measured against two benchmarks, the Russell 3000® and Burgiss Private Private iQ.

The following graph illustrates Portfolio IRR performance versus benchmarks as of December 31, 2019.

StepStone believes the Russell 3000® Index plus 300 bps from inception appropriately reflects the opportunity cost of investing in Buyout, Venture Capital, and Special Situations investments versus publicly traded common stocks and therefore is an appropriate benchmark for SERS.



SERS' returns include Buyout, Venture Capital, and Special Situations investments from vintage years 1980 to 2019.

SERS' Core Buyout, Venture Capital, and Special Situations investments have a since inception IRR of 14.9%, 16.2%, and 14.0% respectively.

	1 YEAR RETURN	3 YEAR RETURN	5 YEAR RETURN	10 YEAR RETURN
<b>SERS Combined Portfolio (IRR)</b>	<b>14.3%</b>	<b>12.5%</b>	<b>9.1%</b>	<b>11.9%</b>
Burgiss Private iQ Pooled PE Benchmark <sup>11</sup>	14.6%	14.6%	12.0%	13.2%
Burgiss Private iQ All PE Top-Quartile <sup>12</sup>	19.8%	20.6%	17.6%	18.7%
Russell 3000® <sup>8</sup>	31.0%	14.6%	11.2%	13.4%
Russell 3000® + 300 bps <sup>8</sup>	34.0%	17.6%	14.2%	16.4%
<b>SERS Core Buyout (IRR)</b>	<b>14.2%</b>	<b>14.4%</b>	<b>12.0%</b>	<b>14.6%</b>
Burgiss Private iQ Pooled Buyout Benchmark <sup>11</sup>	14.2%	14.7%	12.5%	13.3%
Burgiss Private iQ Buyout Top-Quartile <sup>12</sup>	20.1%	22.4%	19.2%	19.8%
<b>SERS Core Venture Capital (IRR)</b>	<b>26.9%</b>	<b>24.4%</b>	<b>16.4%</b>	<b>20.3%</b>
Burgiss Private iQ Pooled VC Benchmark <sup>11</sup>	18.7%	18.2%	13.8%	15.3%
Burgiss Private iQ VC Top-Quartile <sup>12</sup>	22.8%	22.3%	18.8%	20.0%
<b>SERS Core Special Situations (IRR)</b>	<b>21.6%</b>	<b>14.5%</b>	<b>8.5%</b>	<b>12.2%</b>
Burgiss Private iQ Pooled SS Benchmark <sup>11</sup>	6.8%	7.6%	6.8%	9.5%
Burgiss Private iQ SS Top-Quartile <sup>12</sup>	12.2%	13.0%	11.7%	12.8%
<b>SERS Keystone Legacy Fund (IRR)</b>	<b>1.2%</b>	<b>3.7%</b>	<b>4.0%</b>	<b>8.2%</b>
Burgiss Private iQ Pooled PE Benchmark <sup>11</sup>	14.6%	14.6%	12.0%	13.2%
Burgiss Private iQ All PE Top-Quartile <sup>12</sup>	19.8%	20.6%	17.6%	18.7%

Note: Burgiss Private iQ data is continuously updated and is therefore subject to change. The referenced indices are shown for general market comparisons and are not meant to represent any specific fund. An investor cannot directly invest in an index. Moreover, indices do not reflect commissions or fees that may be charged to an investment product based on the index, which may materially affect the performance data presented.

Past performance is not necessarily indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

## II. Market Overview

### Executive Summary

The ongoing COVID-19 pandemic is causing significant disruption in nearly every aspect of the world economy. Equity markets are experiencing corrections not seen since the Global Financial Crisis, the Chicago Board Option Exchange's Volatility Index ("VIX") has reached an all-time high and countries around the world are approving large stimulus packages to combat the economic effects of the virus. Given the current volatility and dislocation in the markets due to COVID-19, StepStone has prepared white papers and analysis detailing the potential impact on the private markets with respect to asset classes, sectors, geographies, investment/exit activity, liquidity concerns, etc., which have been shared with our clients.

The remainder of this overview is based on year-end 2019 data and follows StepStone's standard quarter-over-quarter format.

Global equity markets moved higher in the fourth quarter of 2019, as the geopolitical risks and trade uncertainty that dominated markets for much of 2019 faded. The MSCI Emerging Markets Index was the top performer during the quarter, rallying 11.4%, as the planned suspension of tariffs on \$160 billion of Chinese imports drove returns. The MSCI Europe Index increased 8.5% on encouraging economic data from Germany as well as optimism surrounding the UK's withdrawal from the European Union. The S&P 500 Total Return Index achieved a new record high during the quarter, returning 9.1%, following the announcement of the phase one trade deal and stable economic data. The strong fourth quarter performance pushed global equities to finish the year with its biggest annual gain since 2013, as the S&P 500 outperformed the rest of the world, with an annualized return of 31.5%, while emerging markets and Europe lagged, returning 16.1% and 15.4%, respectively.

In private markets, U.S. leveraged buyout ("LBO") debt volume decreased 14.3% quarter-over-quarter and 8.5% year-over-year to \$23.7 billion but was still 17.3% higher than the 10-year quarterly average of \$20.2 billion. According to data from S&P, purchase price multiples for U.S. LBOs decreased to 11.3x EBITDA in the fourth quarter, down 12.1% from 12.9x EBITDA in the prior quarter, but above the 10-year average of 9.7x EBITDA. Average debt multiples of large corporate U.S. LBO loans decreased to 5.9x from 6.3x over the quarter, but still remained above the 10-year average of 5.5x. Equity contributions for U.S. LBOs increased to near record highs set in 2009 to 50.6%, a 2.6% increase quarter-over-quarter and above the 10-year average of 41.7%.<sup>13</sup>

Global private equity fundraising remained strong in the fourth quarter with totals dollars raised equaling \$176.5 billion, an increase of 19.5% compared to the fourth quarter of 2018, bringing aggregate amounts raised in 2019 to \$667.1 billion, a record annual high for the industry. U.S.-focused funds represented 70.0% of total dollar amount raised during the quarter, above the 10-year average of 60.3%. Funds raised in Europe, Asia, and the Rest of World made up 16.2%, 6.1% and 7.6%, respectively, of global fundraising for the quarter. Dollars invested by private equity funds rose 3.0% quarter-over-quarter but was down 4.0% year-over-year, however the average investment per company increased 9.0% quarter-over-quarter to \$22.3 million. Over 37% of the capital deployed in the fourth quarter went towards companies operating in the Telecommunication Services sector.

Private equity-backed IPO transaction volume decreased in the fourth quarter by 42.0% compared to the prior quarter and by 11.2% compared to the fourth quarter of 2018, with \$4.5 billion raised in 23 IPOs. Despite the lower quarterly totals, private equity-backed IPO transaction volume for all of 2019 was the largest amount since 2014, raising \$37.5 billion. The largest IPOs of the fourth quarter were completed by XP Investimentos CCTVM SA (NASDAQ: XP), an operator of a technology-driven financial services platform that provides financial products and services in Brazil, which raised \$2.3 billion, and Bill.com LLC (NYSE: BILL), a provider of cloud-based software that digitizes and automates back-office financial operations for small and mid-size businesses worldwide, which raised \$248.5 million. Together these deals represented 55.5% of the total value for all

IPOs during the quarter. The largest IPO of 2019 was completed by Uber Technologies, Inc (NYSE: UBER), a provider of technology applications that enable providers of ridesharing and meal preparation and delivery services to transact with end-users worldwide, which raised \$8.1 billion. M&A activity decreased 22.9% quarter-over-quarter to \$101.2 billion and was down 63.7% compared to the fourth quarter of 2018. As for 2019, M&A saw its lowest levels of activity since 2011, raising \$526.1 billion. The largest M&A deals of the quarter were the \$7.0 billion purchase of Versum Materials, Inc. by MERCK Kommanditgesellschaft auf Aktien (XTRA: MRK) and the \$5.7 billion purchase of CIR III-1 REIT and ColFin Cobalt REIT, Inc. by The Blackstone Group Inc. (NYSE: BX). Together these deals represented 45.8% of the total value for all deals during the quarter.<sup>14</sup>

## Capital Markets Overview

### Public Equity Markets

After a sluggish third quarter, global public markets rose strongly as U.S.-China trade tensions eased upon the agreement of a phase one trade deal. While multiple indices experienced all-time highs at the end of 2019, these gains were erased in March as the Covid-19 outbreak impacted the markets.



The following table shows the returns of four major MSCI indices, as well as the S&P 500 and the S&P 500 Total Return Index, over various time horizons through December 31, 2019. Returns for time periods greater than one year are annualized. During the quarter, Emerging Markets increased 11.4%, followed by the MSCI Asia at 9.8%, S&P 500 Total Return at 9.1%, MSCI ACWI at 8.6%, and MSCI Europe at 8.5%.

### Regional Indices

	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr
MSCI Asia	9.8%	16.1%	8.6%	4.9%	4.0%
MSCI Europe	8.5%	20.0%	6.6%	2.1%	2.2%
MSCI EM	11.4%	15.4%	8.9%	3.1%	1.2%
MSCI ACWI	8.6%	24.1%	10.2%	6.3%	6.6%
S&P 500	8.5%	28.9%	13.0%	9.4%	11.2%
S&P 500 Total Return*	9.1%	31.5%	15.3%	11.7%	13.6%

For the period ended December 31, 2019

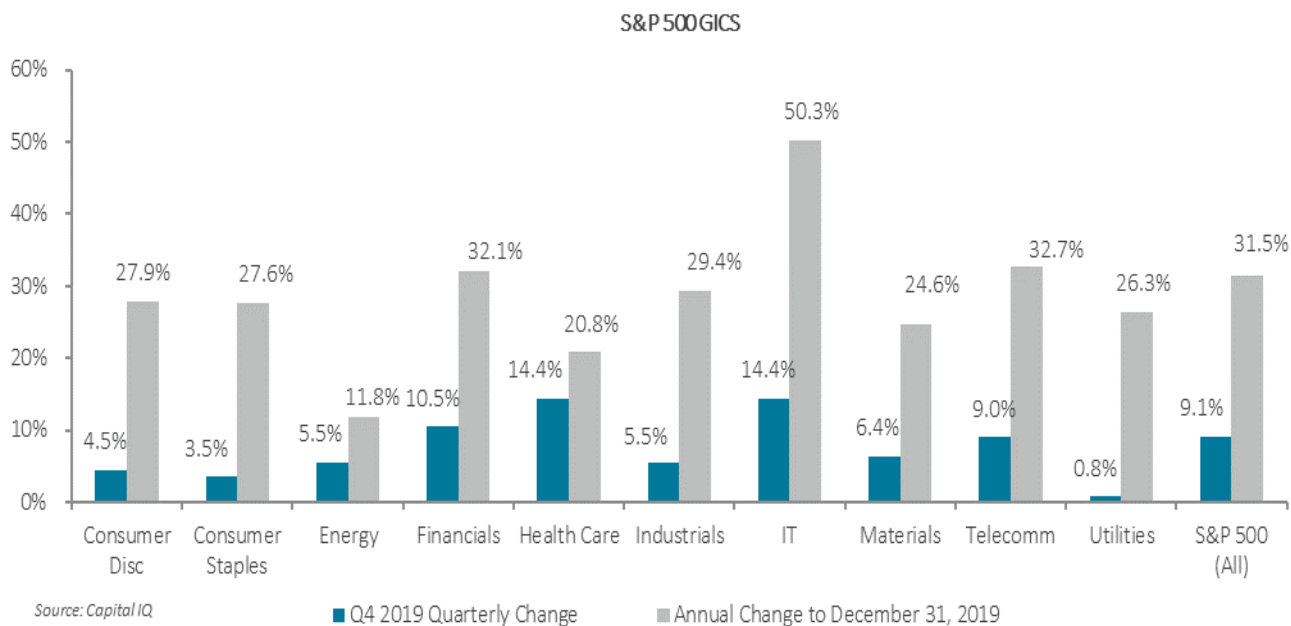
\*Includes reinvestment of dividends.

Source: Capital IQ



The following table shows the quarterly and annual returns of the S&P 500 Total Return and each GIC sector for the period ending December 31, 2019. The S&P 500 Total Return saw its highest annual increase since 2013, returning 31.5%, led by Information Technology, Telecomm, and Financials, with annualized returns of 50.3%, 32.7%, and 32.1%, respectively.

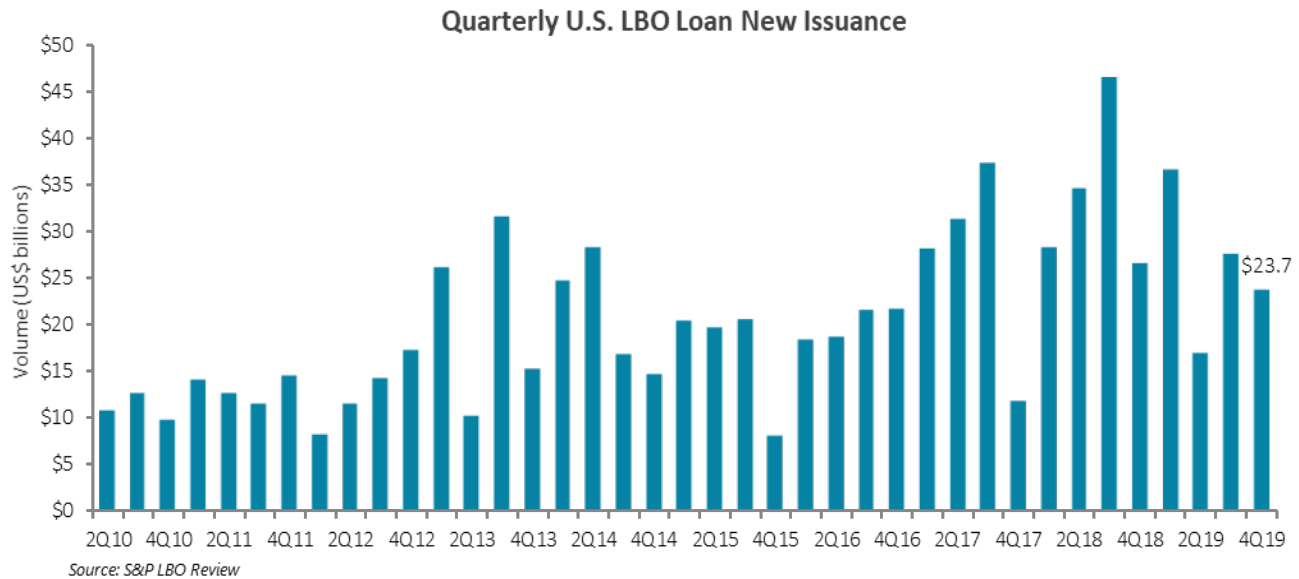
As previously noted, COVID-19 had a significant impact on equity markets in the first quarter of 2020. The Dow Jones Industrial Average and S&P 500 recorded their worst start to a year in history, declining 23.2% and 20.0%, as investors experienced the fastest bear market ever. At quarter end, nine out of the 11 sectors in the S&P 500 closed at least 20% below their 52-week highs. Energy, Financials and Industrials were hit the hardest during the quarter as each sector saw declines of 51.0%, 32.3%, and 27.4%, respectively. Information Technology, Health Care, and Consumer Staples were the top performing sectors during the quarter, declining 12.2%, 13.0%, and 13.4%, respectively, as demand for essential items spiked in response to a nationwide economic shutdown.



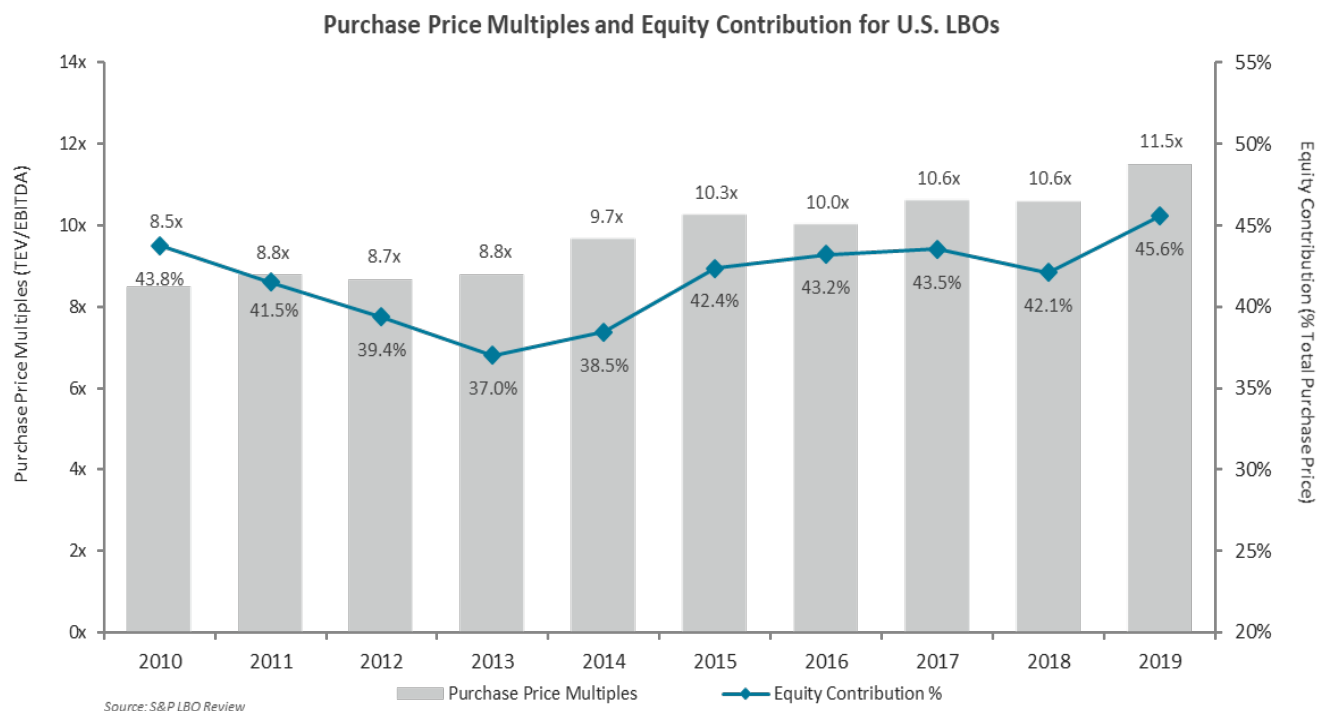
The referenced indices are shown for general market comparisons and are not meant to represent any particular fund. An investor cannot directly invest in an index. Moreover, indices do not reflect commissions or fees that may be charged to an investment product based on the index, which may materially affect the performance data presented.

## Debt Markets

During the fourth quarter of 2019, U.S. LBO new loan issuance totaled \$23.7 billion, representing a decrease of 14.3% from the prior quarter and a decrease of 10.8% from the fourth quarter of 2018. The following chart shows the quarterly volume of U.S. LBO new loan issuance for the past ten years.



The weighted average purchase price multiple for U.S. LBO deals decreased to 11.3x total enterprise value (“TEV”) to EBITDA in the fourth quarter from 12.9x EBITDA in the prior quarter, resulting in an annual average of 11.5x EBITDA, above the 10-year average of 9.7x. Average debt multiples of large corporate U.S. LBO loans remained flat year-over-year at 5.8x EBITDA, as equity contributions for U.S. LBOs increased from 42.1% to 45.6%. The following chart compares purchase price multiples and equity contribution percentages for U.S. LBO deals.



## Private Equity Market Overview

### All Private Equity

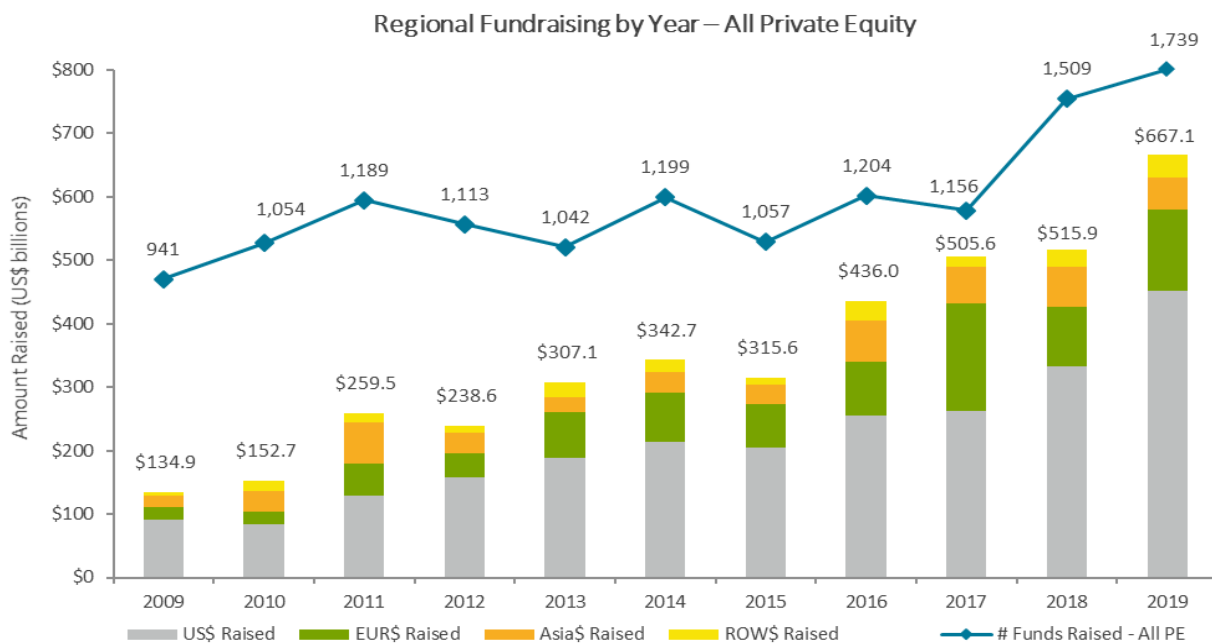
The table below shows the pooled Internal Rate of Return (“IRR”) performance of global private equity investments by sector over various investment horizons through December 31, 2019. The All Private Equity benchmark had an IRR of 4.5% for the quarter. Four out of five sectors were positive for the quarter, led by Venture Capital with 5.7%, followed by Large Buyouts with 5.2%, Small/Middle Buyouts with 4.2%, Mezzanine with 2.8%, and Energy with (2.0%).

Sector	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr
Small/Middle Buyouts (<\$3bn)	4.2%	13.7%	15.5%	12.8%	13.1%
Large Buyouts (>\$3bn)	5.2%	17.8%	16.6%	14.1%	14.3%
Mezzanine	2.8%	8.5%	9.3%	8.0%	9.7%
Energy	(2.0%)	(10.7%)	(4.8%)	(2.5%)	2.4%
Venture Capital	5.7%	18.8%	18.0%	13.8%	15.4%
<b>All Private Equity</b>	<b>4.5%</b>	<b>15.0%</b>	<b>14.9%</b>	<b>12.3%</b>	<b>13.3%</b>

Source: Burgiss PrivateIQ

### Fundraising

Global private equity fundraising totaled \$176.5 billion in the fourth quarter, representing a decrease of 1.0% quarter-over-quarter and an increase of 19.5% compared to the fourth quarter of 2018. Buyout fundraising, which represented 76.6% of the total amount raised for the quarter, totaled \$135.2 billion, a decrease of 6.8% from the prior quarter and an increase of 22.1% compared to the prior year period. Venture Capital raised \$25.1 billion in the fourth quarter, an increase of 6.4% quarter-over-quarter and a decrease of 2.8% compared to the fourth quarter of 2018. Geographically, the U.S. represented 70.0% of total funds raised in the quarter, above its 10-year average of 60.3%. Funds raised in Europe, Asia, and the Rest of World made up 16.2%, 6.1% and 7.6% of global fundraising for the quarter, respectively. The chart below shows annual private equity fundraising activity across all sectors.

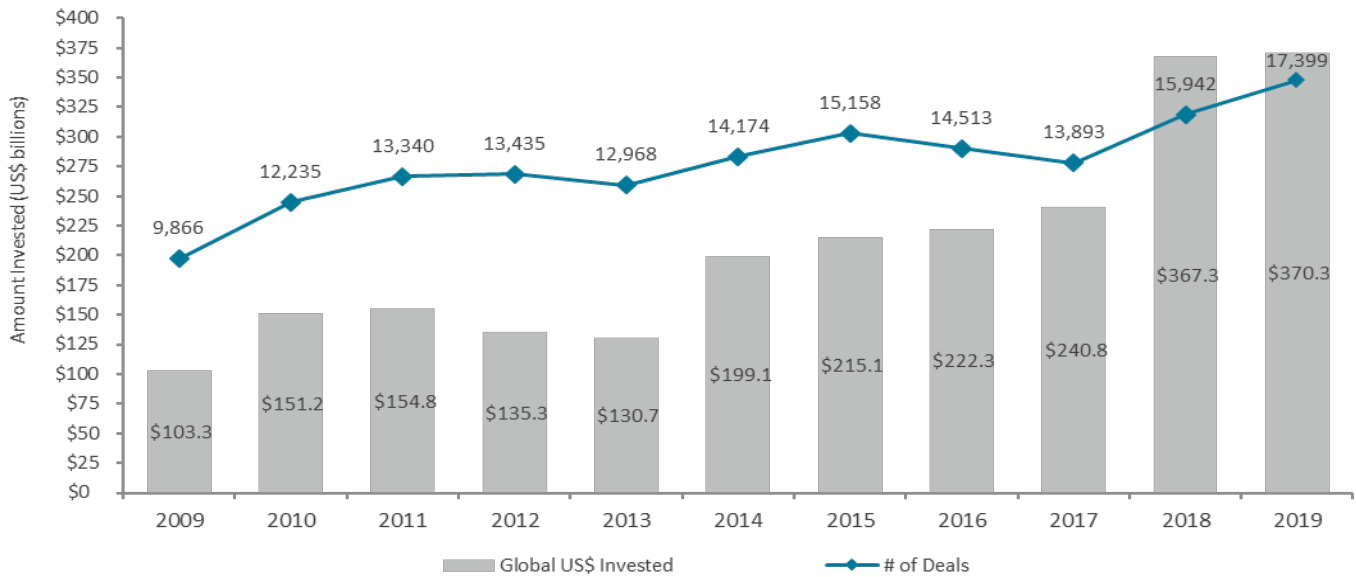


Source: Thomson ONE

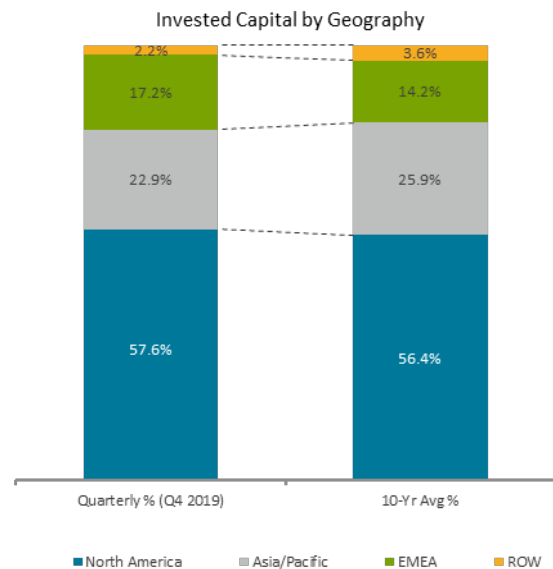
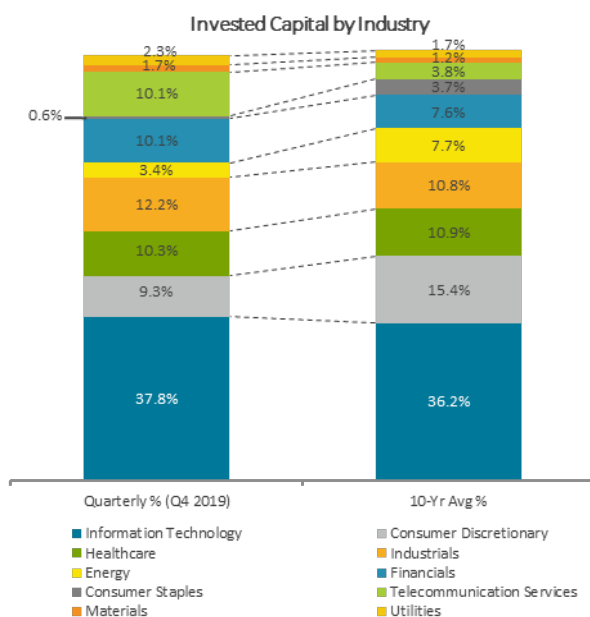
## Investment Activity

Private equity funds invested \$95.2 billion globally during the fourth quarter, representing a quarter-over-quarter increase of 3.0% and a decrease of 4.0% from the fourth quarter of 2018. The average investment size during the quarter was \$22.3 million, an increase of 9.0% compared to the average investment size of \$20.5 million in the third quarter.

### Investment Activity - All Private Equity

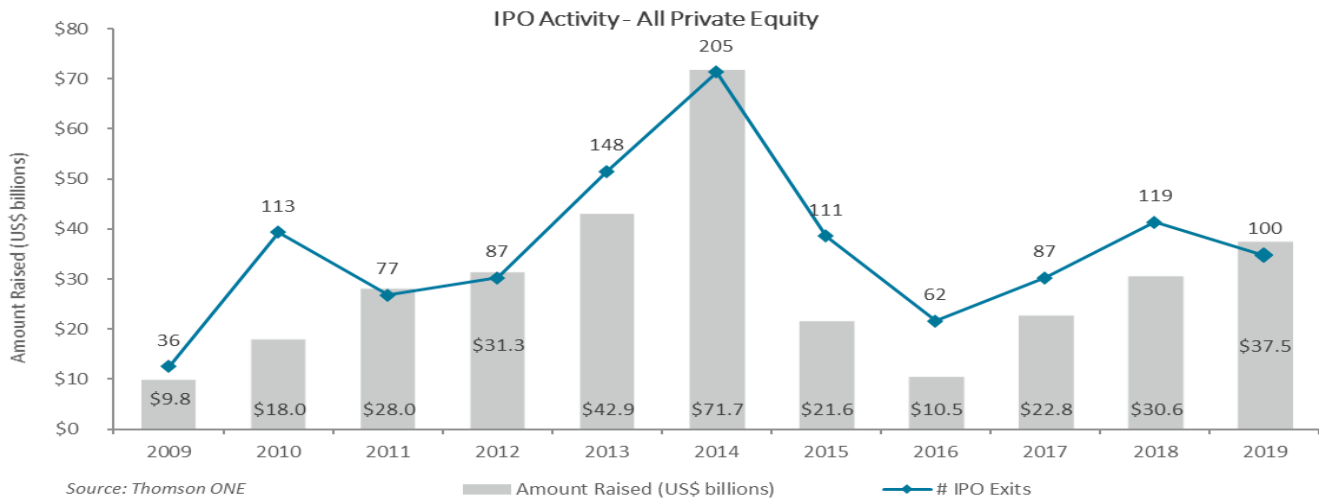


The graphs below depict the percentage of invested capital by industry and geography for the fourth quarter of 2019 and over the last ten years. The Telecommunication Services sector had the largest variance from its 10-year average, accounting for \$9.6 billion of transactions, or 10.1% of total capital invested by private equity firms, compared to its 10-year average of 3.8%. Geographically, investment activity in North America was above its 10-year average, comprising 57.6% of total capital invested in the fourth quarter.

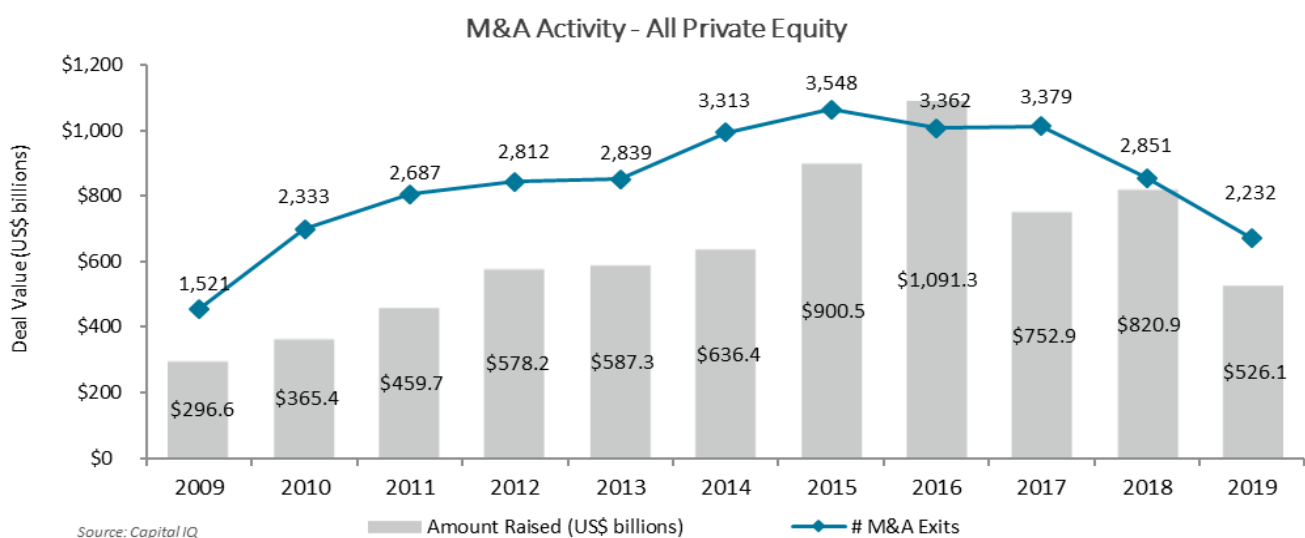


## Deal Environment

In the fourth quarter, the number of private equity-backed IPOs remained flat at 23, but the amount raised decreased 42.0%, from \$7.8 billion to \$4.5 billion, compared to the prior quarter. The IPOs were comprised of 21 venture capital-backed offerings that raised a total of \$2.2 billion, and two offerings from buyouts that raised \$2.3 billion. The largest IPOs of the fourth quarter were completed by XP Investimentos CCTVM SA (NASDAQ: XP), an operator of technology-driven financial services platform that provides financial products and services in Brazil, which raised \$2.3 billion, and Bill.com LLC (NYSE: BILL), a provider of cloud-based software that digitizes and automates back-office financial operations for small and midsize businesses worldwide, which raised \$248.5 million. Together these deals represented 55.3% of the total value for all IPOs in the quarter. The graph below shows the amount raised and the number of IPOs on the NYSE and NASDAQ.



The number of private equity-backed Mergers and Acquisitions (“M&A”) decreased 19.7%, and the total value of M&A deals decreased 35.9% compared to the prior year. In the fourth quarter, there were 584 private equity backed M&A deals totaling \$101.2 billion. The largest M&A deals of the quarter were the \$7.0 billion purchase of Versum Materials, Inc. by Merck Kommanditgesellschaft auf Aktien (XTRA: MRK) and the \$5.7 billion purchase of CIR III-1 REIT and ColFin Cobalt REIT, Inc. by The Blackstone Group Inc. (NYSE: BX). Together these deals represent 12.5% of the total value for all deals in the quarter. The graph below shows the deal value and the number of M&A deals.



### III. SERS Portfolio Review

#### Summary

During the fourth quarter of 2019, SERS made total contributions of \$192.6 million (including \$12.3 million in fees) and received \$250.0 million in distributions, for a net cash inflow of \$57.4 million during the period. With \$4.0 billion in market value and \$2.7 billion in unfunded commitments as of December 31, 2019, SERS' total exposure to private equity is approximately \$6.7 billion.

#### New Investment Commitments

The Portfolio made five new commitments for the period, October 1, 2019 through December 31, 2019.

##### New Investment Commitments Q4 2019

Fund	Closing Date	Sector	Geographic Focus	Commitments (\$)
KPS Special Situations Fund V	10/15/2019	Special Situations	North America	\$75.0
KPS Special Situations Mid-Cap Fund	10/15/2019	Special Situations	North America	\$25.0
Ares PA Opportunities Fund, L.P. – Special Situations	11/26/2019	Special Situations	Global	\$100.0
Clearlake Capital Partners VI	12/10/2019	Special Situations	North America	\$60.0
Insight Venture Partners XI	12/16/2019	Venture Capital	North America	\$75.0
<b>Total</b>				<b>\$335.0</b>

#### Subsequent Investment Commitments

The Portfolio made one new commitment for the period, January 1, 2020 through March 31, 2020.

##### New Investment Commitments Q1 2020

Fund	Closing Date	Sector	Geographic Focus	Commitments (\$)
Altaris Health Partners V	2/26/2020	Buyout	North America	\$50.0
<b>Total</b>				<b>\$50.0</b>

## Performance

### Quarterly Performance

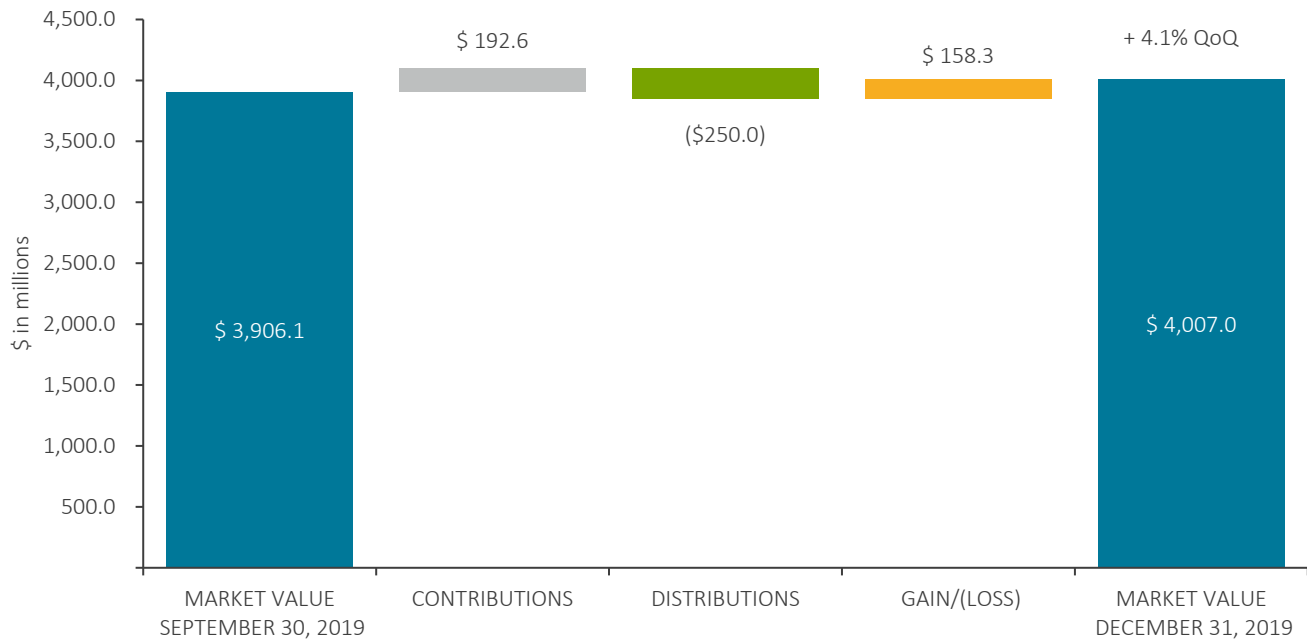
The following table details the quarterly change in value by contributions, distributions, and unrealized gains and losses which occurred during the past eight quarters, net of any partnership fees and expenses.

\$ in millions	2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Beginning Market Value	\$4,034.4	\$4,010.5	\$3,902.5	\$3,989.5	\$3,791.1	\$3,919.6	\$3,985.1	\$3,906.1
Contributed Capital	117.9	110.4	142.5	185.9	167.6	197.0	104.5	192.6
Distributed Capital	(226.3)	(373.2)	(187.7)	(283.5)	(237.8)	(242.5)	(239.6)	(250.0)
<b>Appreciation/(Depreciation)<sup>13</sup></b>	<b>\$84.5</b>	<b>\$154.8</b>	<b>\$132.3</b>	<b>(\$100.8)</b>	<b>\$198.8</b>	<b>\$111.0</b>	<b>\$56.0</b>	<b>\$158.3</b>
Ending Market Value	4,010.5	3,902.5	3,989.5	3,791.1	3,919.6	3,985.1	3,906.1	4,007.0
Unfunded Commitment	2,141.6	2,089.5	2,354.8	2,403.3	2,401.3	2,535.8	2,513.4	2,653.6
<b>Total Exposure</b>	<b>\$6,152.1</b>	<b>\$5,991.9</b>	<b>\$6,344.3</b>	<b>\$6,194.4</b>	<b>\$6,320.9</b>	<b>\$6,520.9</b>	<b>\$6,419.5</b>	<b>\$6,660.6</b>
Since Inception IRR	12.3%	12.3%	12.3%	12.2%	12.2%	12.2%	12.2%	12.2%

### Valuation Movement

The valuation of the Portfolio increased by approximately \$158.3 million, or 4.1% (on a net, after-fees basis) during the fourth quarter, primarily driven by Buyout-focused partnership investments.

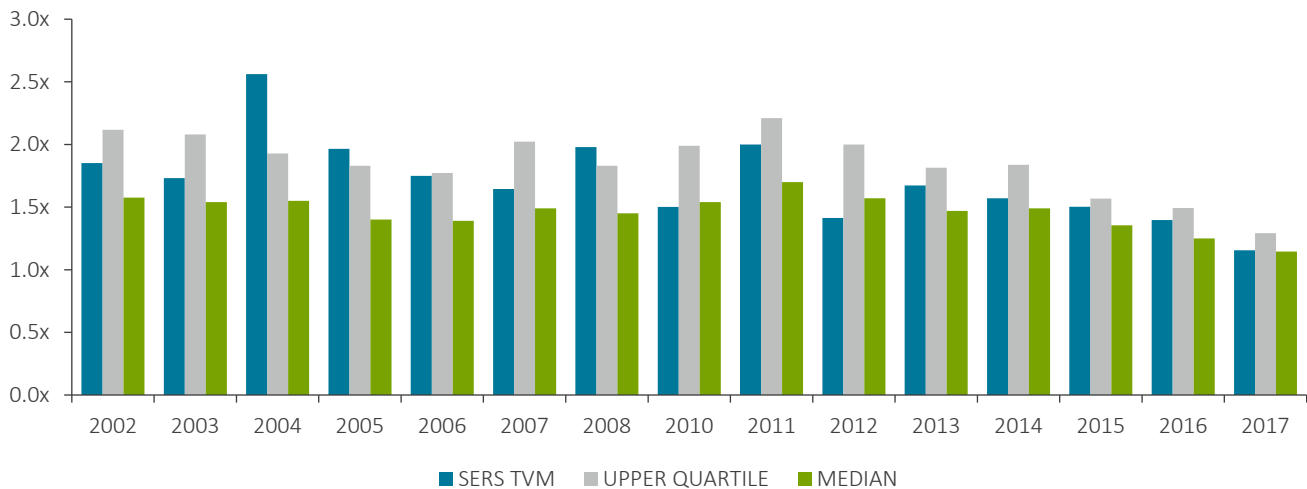
Quarterly Change in Portfolio Value



## Vintage Year Performance by TVM

The following graph illustrates Portfolio investment performance by vintage year as of December 31, 2019 relative to the upper quartile and median Global Private Equity TVM benchmarks as provided by Burgiss Private iQ. Performance of funds that are less than two years old is not meaningful. In aggregate, 13 out of 15 vintage years shown have outperformed the median and three have outperformed the upper quartile.

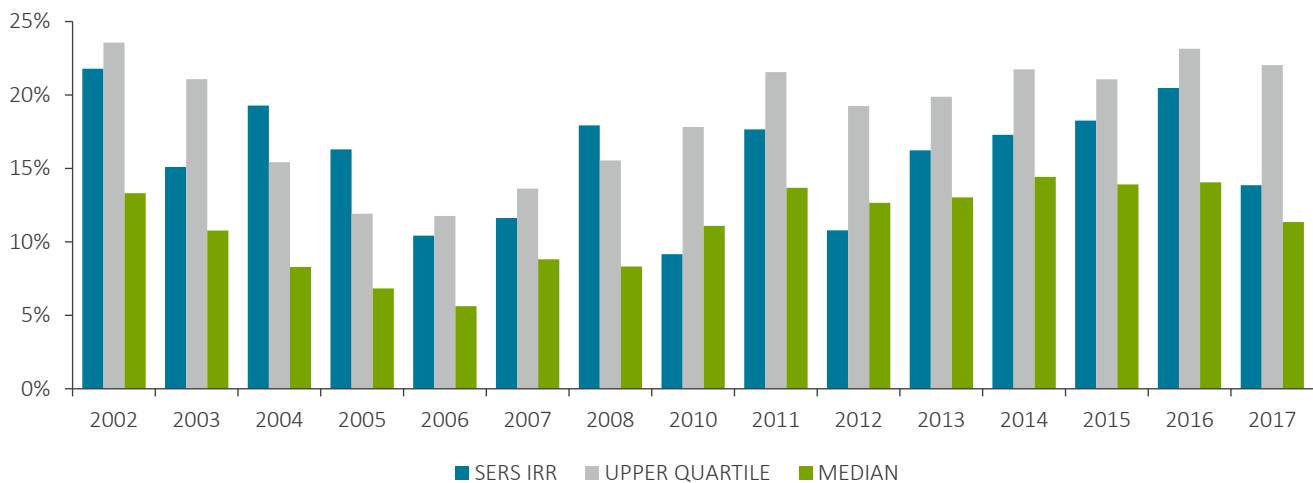
RELATIVE VINTAGE YEAR PERFORMANCE BY TVM



## Vintage Year Performance by IRR

The following graph illustrates Portfolio investment performance by vintage year as of December 31, 2019 relative to the upper quartile and median Global Private Equity IRR benchmarks as provided by Burgiss Private iQ. In aggregate, 13 out of 15 vintage years shown have outperformed the median and three have outperformed the upper quartile.

RELATIVE VINTAGE YEAR PERFORMANCE BY IRR



**Note:** Vintage years prior to 2001 have a market value of \$15.8 million, representing 0.4% of the Portfolio's total market value as of December 31, 2019. **Past performance is not necessarily indicative of future results** and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.



## Diversification

### Fund Geographic Focus

(\$ in millions)

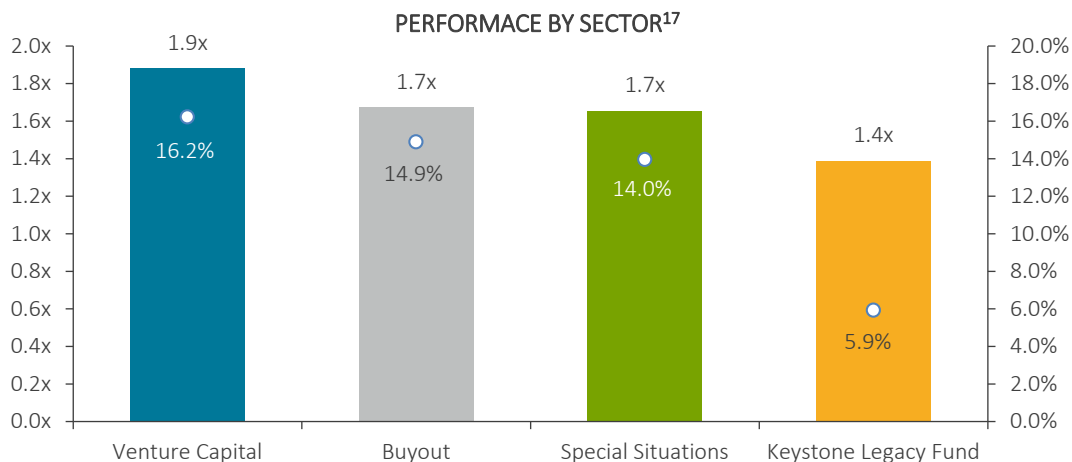
	MARKET VALUE		UNFUNDED		TOTAL EXPOSURE	
	\$	% OF TOTAL	\$	% OF TOTAL	\$	% OF TOTAL
North America	2,141.9	53.5%	1,440.3	54.3%	3,582.1	53.8%
Global	350.9	8.8%	543.0	20.5%	893.9	13.4%
Keystone Legacy Fund	745.1	18.6%	144.5	5.4%	889.6	13.4%
Asia	452.6	11.3%	221.6	8.4%	674.2	10.1%
Europe	221.6	5.5%	265.0	10.0%	486.6	7.3%
Emerging Markets	94.9	2.4%	39.3	1.5%	134.2	2.0%
<b>Total</b>	<b>\$4,007.0</b>	<b>100.0%</b>	<b>\$2,653.6</b>	<b>100.0%</b>	<b>\$6,660.6</b>	<b>100.0%</b>

### Core Portfolio Periodic Returns vs. Russell 3000® Index<sup>16</sup>

	1 YEAR RETURN	3 YEAR RETURN	5 YEAR RETURN	10 YEAR RETURN	SINCE INCEPTION
<b>SERS Core Portfolio (IRR)</b>	<b>18.3%</b>	<b>16.6%</b>	<b>12.3%</b>	<b>15.2%</b>	<b>15.2%</b>
Russell 3000® <sup>14</sup>	31.0%	14.6%	11.2%	13.4%	10.2%
Russell 3000® + 300 bps	34.0%	17.6%	14.2%	16.4%	13.2%
<i>PA SERS Outperformance/(Underperformance)</i>					
Russell 3000®	(12.7%)	2.0%	1.0%	1.8%	5.0%
Russell 3000® + 300 bps	(15.7%)	(1.0%)	(2.0%)	(1.2%)	2.0%

### Performance by Sector

Venture Capital is the best performing sector generating an IRR of 16.2% and a TVM of 1.9x as of December 31, 2019.

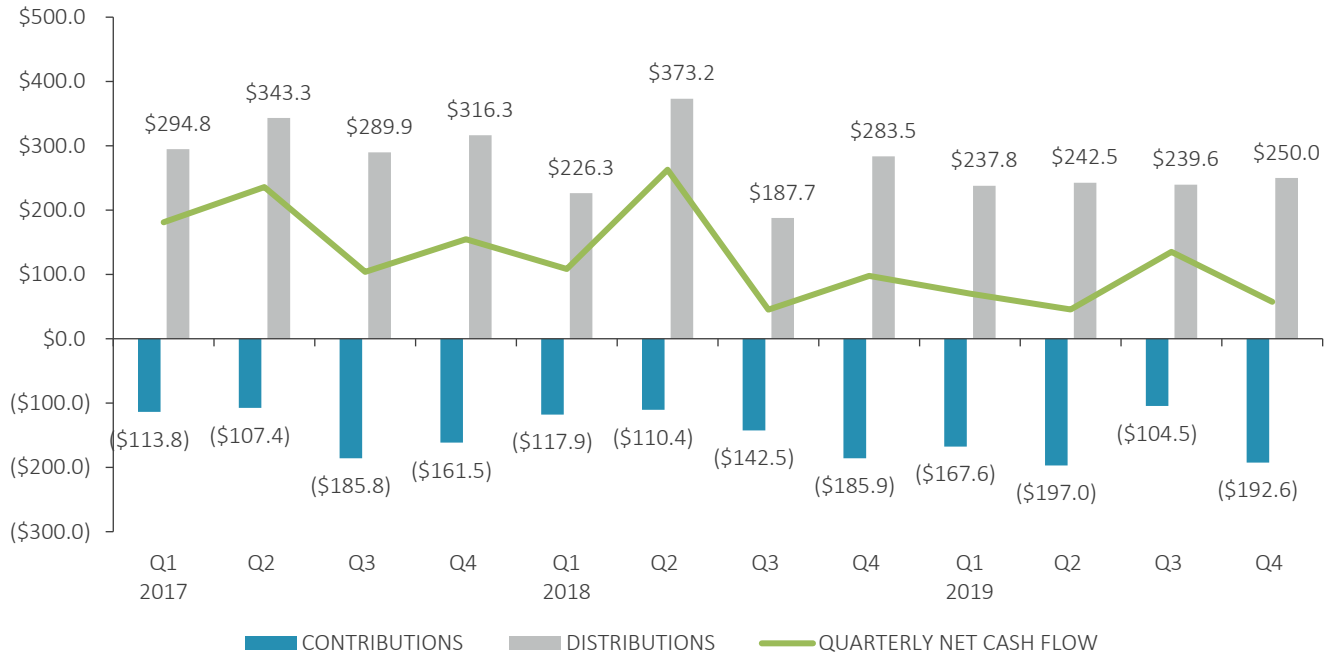


**Past performance is not necessarily indicative of future results** and there can be no assurance that the fund will achieve comparable results or avoid substantial losses. The referenced indices are shown for general market comparisons and are not meant to represent any particular fund. An investor cannot directly invest in an index. Moreover, indices do not reflect commissions or fees that may be charged to an investment product based on the index, which may materially affect the performance data presented.

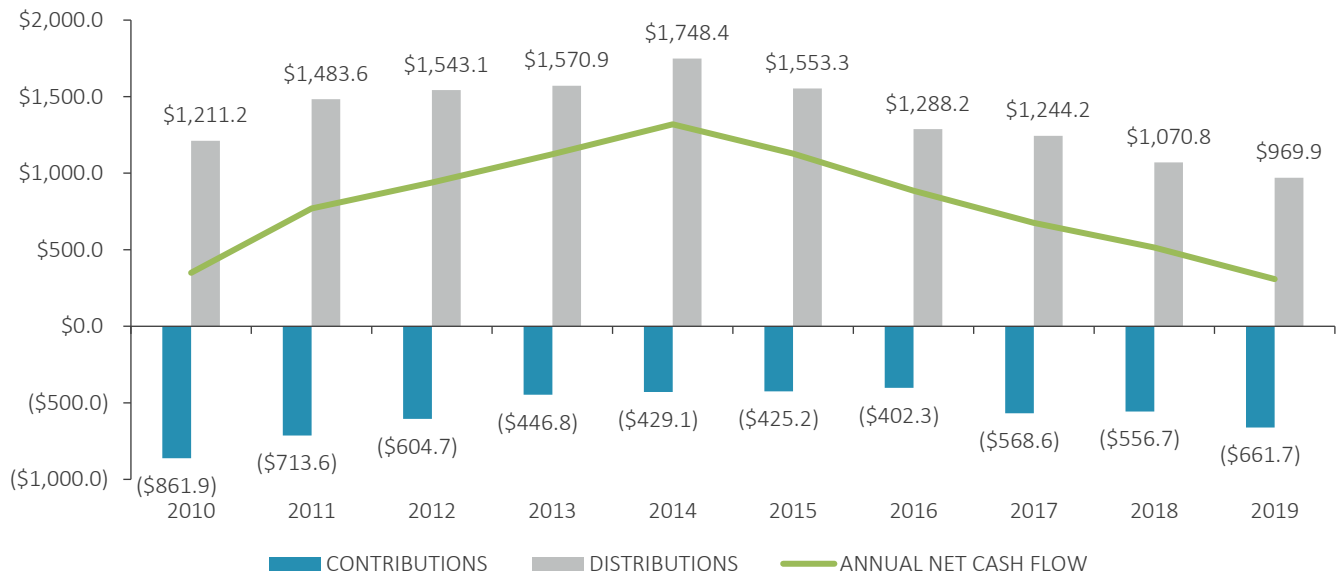
## Portfolio Cash Flow Analysis

During the fourth quarter of 2019, the Portfolio made \$192.6 million of contributions and received \$250.0 million of distributions, for a net cash inflow of \$57.4 million. The portfolio has been cash flow positive for 40 consecutive quarters. The graphs below illustrate recent cash flow activity by quarter and year.

### Quarterly Cash Flow Activity

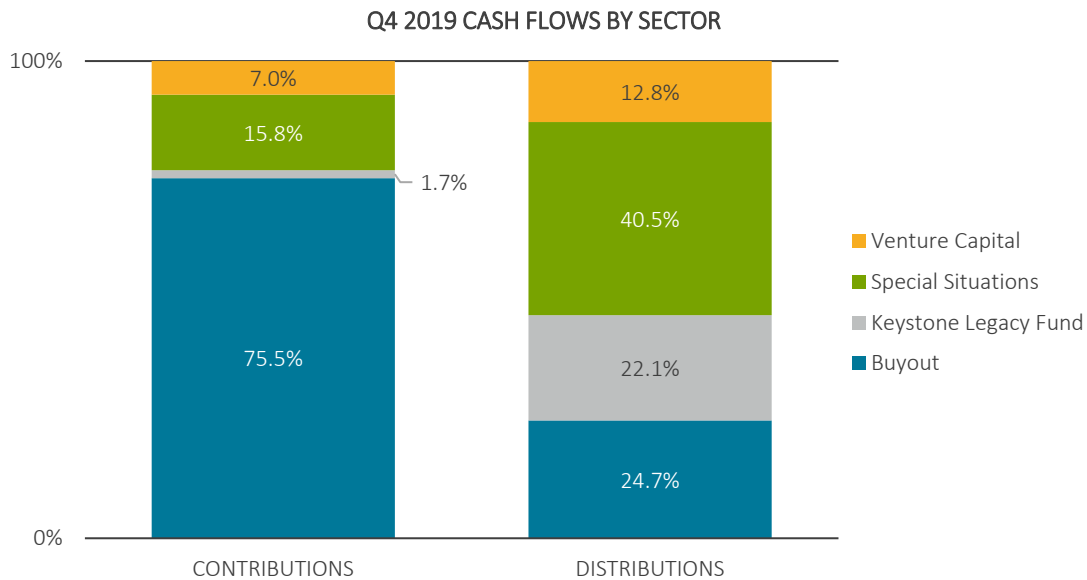


### Annual Cash Flow Activity



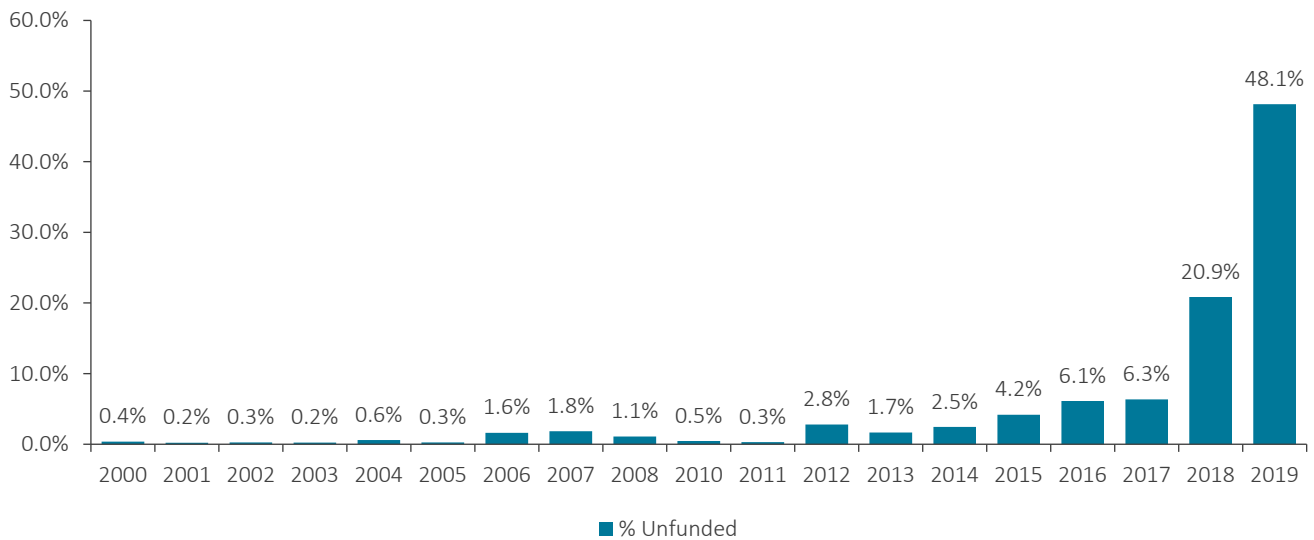
## Cash Flow by Sector

Buyout and Special Situation funds were the most active in terms of cash flow activity during the fourth quarter of 2019, with Buyout funds drawing down \$145.3 million, or 75.5% of total contributions during the quarter, and Special Situation funds distributing \$101.2 million, or 40.5% of total distributions during the quarter.



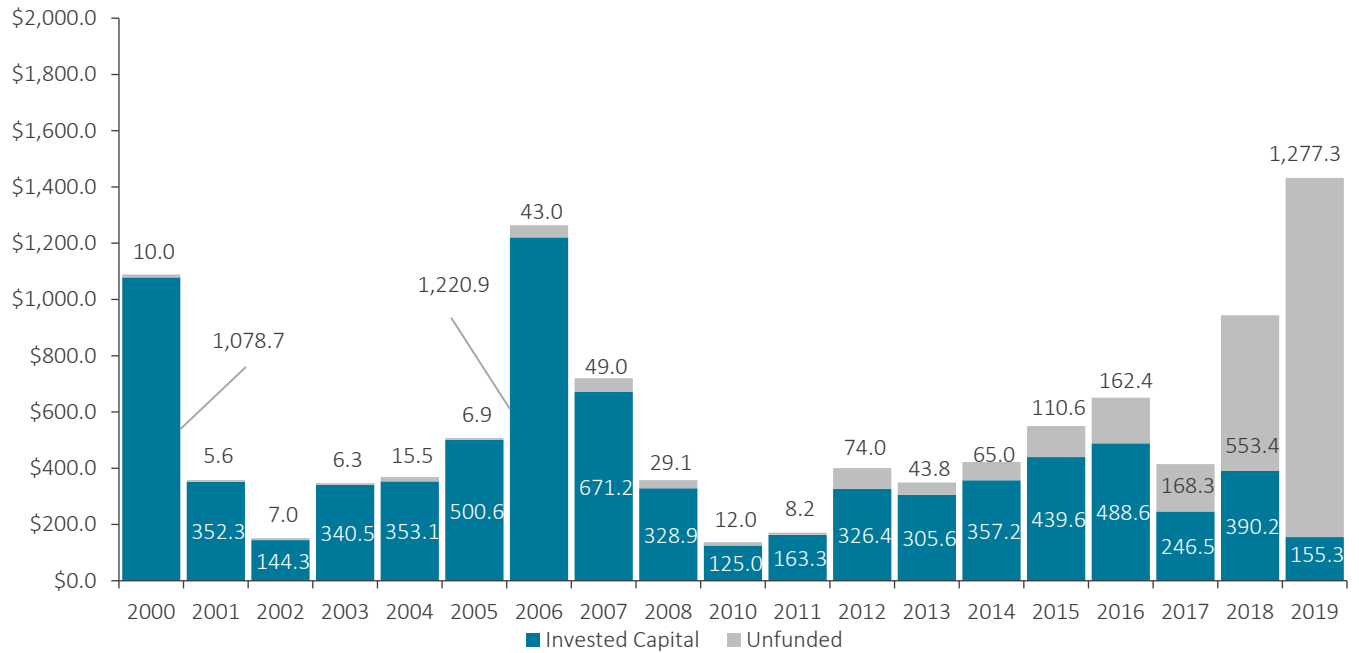
## Unfunded % by Vintage Year

The following chart provides unfunded commitments by vintage year as a percentage of the Portfolio's total unfunded commitments. Vintage years 2015 through 2019 make up 85.6% of the Portfolio's unfunded commitments.



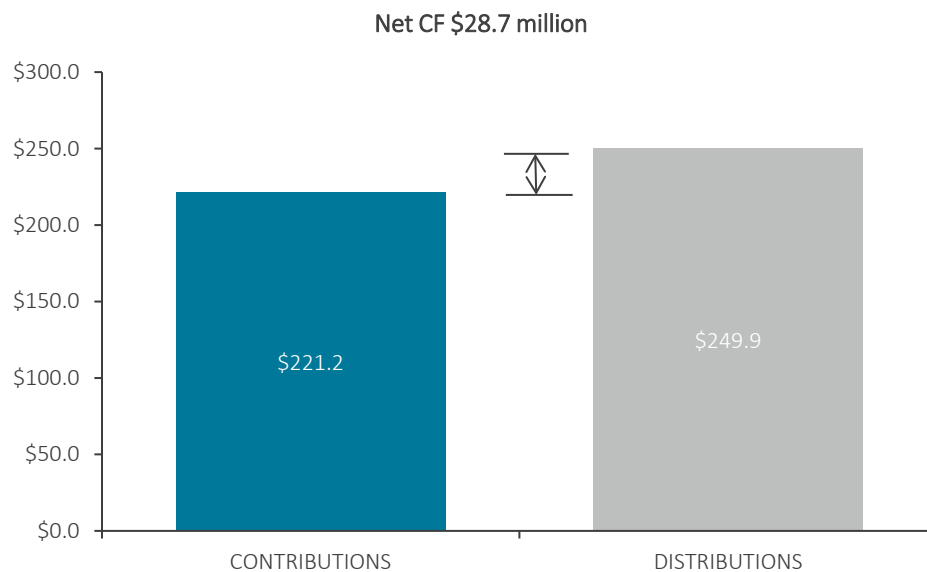
## Invested Capital to Unfunded by Vintage Year

The following chart provides invested capital and unfunded capital commitments by vintage year.



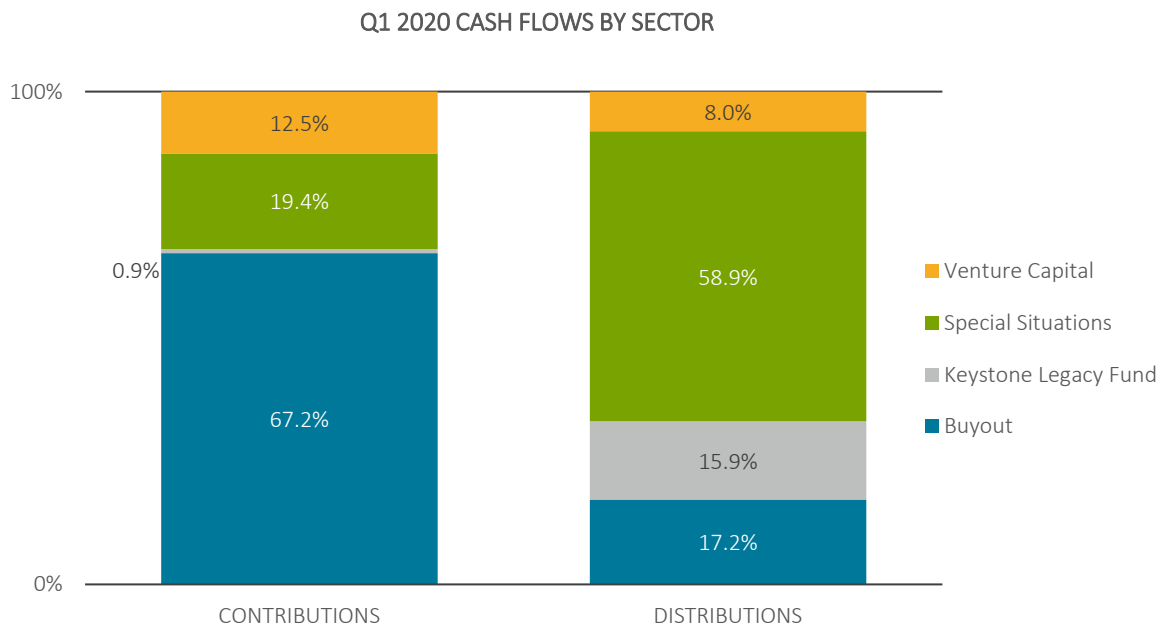
## Subsequent Cash Flow Activity

Subsequent to quarter-end through March 31, 2020, the Portfolio made \$221.2 million of contributions and received \$249.9 million of distributions, for a net cash inflow of \$28.7 million, a decrease of 50.0% from the previous quarter total.



## Subsequent Cash Flow by Sector

The largest concentration of net cash flows during Q1 2020 was from Special Situations, which resulted in a net cash inflow of \$104.2 million.



## IV. End Notes

<sup>1</sup> Commitment reflects original commitment including FX fluctuations for non-USD funds.

<sup>2</sup> Contributed Capital includes contributions for investments, management fees and expenses to underlying partnership investments.

<sup>3</sup> Includes stock distributions.

<sup>4</sup> Total Exposure represents the sum of Market Value and Unfunded Commitment.

<sup>5</sup> DPI, or Distributed to Paid-In Multiple, is a performance metric that measures distributions received relative to capital invested. DPI is calculated as Distributed Capital divided by Contributed Capital.

<sup>6</sup> TVM, or Total Value Multiple, is a performance metric that measures total value created by the Portfolio relative to capital invested, without consideration for time. TVM is calculated as Total Value, which is comprised of Market Value plus Distributed Capital, divided by Contributed Capital. TVM net of StepStone's fees is 1.60x.

<sup>7</sup> IRR, or Internal Rate of Return, is a performance metric that is calculated based on the Portfolio's daily cash flows and market value as of quarter-end. IRR is net of manager's fees, expenses and carried interest. IRR net of StepStone's fees is 12.22% as of December 31, 2019.

<sup>8</sup> Benchmark is a dollar-weighted calculation of quarterly changes in the Russell 3000<sup>®</sup> Index. Russell Investment Group is the source and owner of the trademark, service marks and copyrights related to the Russell Indexes. Russell<sup>®</sup> is a trademark of Russell Investment Group. Returns shown are time-weighted (TWR).

<sup>9</sup> Benchmark is provided by Burgiss Private iQ and reflects Global Private Equity Funds (excluding Real Assets and Real Estate) Median IRR as of December 31, 2019, for funds with vintage years 1980 to 2019. Returns shown are dollar-weighted (IRR).

<sup>10</sup> Benchmark is provided by Burgiss Private iQ and reflects Global Private Equity Funds (excluding Real Assets and Real Estate) Upper Quartile IRR as of December 31, 2019, for funds with vintage years 1980 to 2019. Returns shown are dollar-weighted (IRR).

<sup>11</sup> Benchmark is provided by Burgiss Private iQ and reflects Global pooled returns for Buyout (including Natural Resources), Venture Capital, Special Situations (including Distressed and Mezzanine), and all Private Equity (excluding Real Assets and Real Estate), respectively, as of December 31, 2019, for funds with vintage years 1980 to 2019. Returns shown are dollar-weighted (IRR).

<sup>12</sup> Benchmark is provided by Burgiss Private iQ and reflects Global Upper Quartile IRR for Buyout (including Natural Resources), Venture Capital, Special Situations (including Distressed and Mezzanine), and all Private Equity (excluding Real Assets and Real Estate), respectively, as of December 31, 2019, for funds with vintage years 1980 to 2019. Returns shown are dollar-weighted (IRR).

<sup>13</sup> S&P U.S. LBO Review, Q4 2019.

<sup>14</sup> Capital IQ Transaction Screening Report as of March 4, 2020.

<sup>15</sup> Appreciation/ (Depreciation) represents realized and unrealized gains/(losses) during the quarter, which is comprised of the difference between Ending Market Value and Beginning Market Value plus Contributed Capital minus Distributed Capital.

**Past performance is not necessarily indicative of future results** and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

<sup>16</sup> Benchmark is a dollar-weighted calculation of quarterly changes in the Russell 3000<sup>®</sup> Index. Russell Investment Group is the source and owner of the trademark, service marks and copyrights related to the Russell Indexes. Russell<sup>®</sup> is a trademark of Russell Investment Group.

<sup>17</sup> Buyout, Venture Capital, and Special Situations sectors represent PASERS core portfolio of investment returns within each sector. Keystone Legacy Fund contains Buyout, Venture Capital, and Special Situation funds defined as non-core by PASERS.

## V. Exhibits

## Exhibit A – Investments by Vintage Year



**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
1997	Apollo Investment Fund IV	Buyout	\$75,000,000	\$74,838,620	\$124,814,033	\$85,233	\$50,060,646	1.7x	8.5%	Second	Second
<b>1997 Total</b>			<b>\$75,000,000</b>	<b>\$74,838,620</b>	<b>\$124,814,033</b>	<b>\$85,233</b>	<b>\$50,060,646</b>	<b>1.7x</b>	<b>8.5%</b>	<b>Second</b>	<b>Second</b>
1998	HarbourVest IPEP III	Buyout	40,000,000	39,400,000	61,092,165	79,937	21,772,102	1.6x	8.6%	Second	Second
<b>1998 Total</b>			<b>\$40,000,000</b>	<b>\$39,400,000</b>	<b>\$61,092,165</b>	<b>\$79,937</b>	<b>\$21,772,102</b>	<b>1.6x</b>	<b>8.6%</b>	<b>Second</b>	<b>Second</b>
1999	HarbourVest Partners VI	Venture Capital	200,000,000	196,586,055	251,156,017	963,720	55,533,682	1.3x	3.6%	Second	Second
1999	Lexington Capital Partners III	Special Situations	35,000,000	34,516,449	43,363,378						
1999	New Enterprise Associates IX	Venture Capital	20,000,000	19,600,000	7,978,301	1,525,026	(10,096,673)	0.5x	(5.8%)	Third	Fourth
1999	TPG Partners III	Buyout	75,000,000	64,119,169	165,990,273						
<b>1999 Total</b>			<b>\$330,000,000</b>	<b>\$314,821,673</b>	<b>\$468,487,969</b>						
2000	ABRY Partners IV	Buyout	35,000,000	25,497,290	74,633,973						
2000	Apollo Investment Fund V	Buyout	50,000,000	44,972,146	122,673,016	434,338	78,135,208	2.7x	38.8%	First	First
2000	Audax Private Equity Fund	Buyout	35,000,000	36,839,098	56,057,910	125,194	19,344,006	1.5x	13.1%	Second	Second
2000	Blackstone Communications Partners I	Buyout	25,000,000	25,114,042	30,998,189	166,401	6,050,548	1.2x	6.2%	Second	Second
2000	Madison Dearborn Capital Partners IV	Buyout	90,000,000	90,365,390	169,072,775	3,152,986	81,860,370	1.9x	14.1%	First	First
2000	New Enterprise Associates X	Venture Capital	35,000,000	35,028,000	33,995,586	5,974,408	4,941,994	1.1x	2.1%	Third	Third
2000	Permira European Fund II	Buyout	48,000,000	45,672,612	91,560,959	304,702	46,193,050	2.0x	21.6%	First	First
2000	Providence Equity Partners IV	Buyout	25,000,000	23,420,840	56,065,270						
<b>2000 Total</b>			<b>\$343,000,000</b>	<b>\$326,909,418</b>	<b>\$635,057,678</b>						
2001	ABRY Mezzanine Partners	Special Situations	30,000,000	26,731,187	49,707,116						
2001	Blackstone Capital IV	Buyout	75,000,000	69,119,097	192,546,094	1,860,115	125,287,112	2.8x	36.2%	First	First
2001	Lexington Capital Partners V	Special Situations	75,000,000	74,623,418	125,170,164						
<b>2001 Total</b>			<b>\$180,000,000</b>	<b>\$170,473,702</b>	<b>\$367,423,374</b>						
2002	Berkshire Fund VI	Buyout	20,000,000	18,819,615	54,873,734						
2002	GTCR VIII	Buyout	75,000,000	69,393,599	120,471,948				22.3%	Second	
<b>2002 Total</b>			<b>\$95,000,000</b>	<b>\$88,213,214</b>	<b>\$175,345,682</b>						

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2003	HarbourVest Partners VII	Venture Capital	75,000,000	73,687,500	106,931,137	12,701,280	45,944,917	1.6x	6.9%	Third	Second
2003	Kelso VII	Buyout	40,000,000	41,169,937	65,821,118	351,863	25,003,044	1.6x	11.4%	Second	Second
2003	New Enterprise Associates 11	Venture Capital	25,000,000	25,000,000	62,741,850	3,902,108	41,643,958	2.7x	15.6%	Second	First
2003	Permira European Fund III	Buyout	115,960,000	127,340,454	217,911,944	482,003	91,053,493	1.7x	26.1%	First	Second
2003	TPG Partners IV	Buyout	30,000,000	27,981,463	57,968,285						
<b>2003 Total</b>			<b>\$285,960,000</b>	<b>\$295,179,353</b>	<b>\$511,374,333</b>						
2004	ABRY Partners V	Buyout	45,000,000	41,752,543	83,342,348						
2004	AXA Secondary Fund III	Special Situations	26,000,000	21,737,894	37,244,706						
2004	AXA Secondary Fund III-2	Special Situations	14,000,000	11,677,210	19,062,764						
2004	LLR Equity Partners II	Buyout	25,000,000	25,000,000	44,945,591	294,505	20,240,096	1.8x	12.2%	Second	Second
2004	Oaktree Capital Management	Special Situations	40,000,000	40,582,060	204,520,995						
2004	OCM Opportunities Fund V	Special Situations	40,000,000	40,003,507	65,911,274						
2004	Providence Equity Partners V	Buyout	45,000,000	42,692,171	51,743,883						
<b>2004 Total</b>			<b>\$235,000,000</b>	<b>\$223,445,385</b>	<b>\$506,771,560</b>						
2005	Apollo Investment Fund VI	Buyout	40,000,000	38,911,805	64,467,407	761,724	26,317,325	1.7x	8.7%	Second	Second
2005	Audax Private Equity Fund II	Buyout	25,000,000	25,517,152	46,325,622	231,933	21,040,403	1.8x	14.1%	First	Second
2005	HIPEP V-Asia Pacific & Rest of World	Buyout	30,000,000	28,245,316	35,192,128	5,570,159	12,516,971	1.4x	6.2%	Third	Second
2005	Lexington Capital Partners VI	Special Situations	50,000,000	53,066,325	69,991,523						
2005	Lightspeed Venture Partners VII	Venture Capital	18,000,000	18,000,000	49,449,448						
2005	Newbridge Asia IV	Buyout	40,000,000	38,903,378	85,845,344						
2005	OCM Opportunities Fund VI	Special Situations	40,000,000	40,000,000	63,171,009						
2005	OCM/GFI Power Opportunities Fund II	Buyout	25,000,000	13,470,852	41,644,215						
<b>2005 Total</b>			<b>\$268,000,000</b>	<b>\$256,114,829</b>	<b>\$456,086,697</b>						
2006	ABRY Senior Equity II	Special Situations	30,000,000	28,282,103	44,960,375						
2006	Asia Alternatives Capital Partners	Buyout	50,000,000	25,190,942	42,170,806	3,251,550	20,231,414	1.8x	10.9%	Second	First

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2006	AXA Secondary Fund IV	Special Situations	80,000,000	70,134,752	99,186,788						
2006	Berkshire Fund VII	Buyout	32,000,000	32,613,861	68,126,503						
2006	Blackstone Capital Partners V	Buyout	150,000,000	150,111,788	242,154,335	6,809,598	98,852,145	1.7x	7.6%	Second	Second
2006	Centerbridge Capital Partners I	Special Situations	50,000,000	57,490,446	113,475,526	6,606,904	62,591,984	2.1x	19.4%	First	First
2006	Eureka II	Buyout	20,000,000	21,884,526	20,777,356	6,732,704	5,625,534	1.3x	4.6%	Third	Third
2006	Francisco Partners II	Buyout	30,000,000	29,383,916	41,240,515	4,754,458	16,611,056	1.6x	10.0%	Second	Second
2006	GTCR IX	Buyout	50,000,000	47,916,718	86,149,702				13.7%	First	
2006	HarbourVest Partners VIII	Venture Capital	100,000,000	98,000,000	138,723,762	50,156,467	90,880,229	1.9x	10.7%	Second	First
2006	Hellman & Friedman Capital Partners VI	Buyout	125,000,000	119,913,412	218,914,920	6,388,246	105,389,754	1.9x	12.9%	First	First
2006	Madison Dearborn Capital Partners V	Buyout	75,000,000	71,556,584	113,632,910	1,670,940	43,747,266	1.6x	7.2%	Second	Second
2006	Meritech Capital Partners III	Venture Capital	35,000,000	35,000,000	190,791,007						
2006	New Enterprise Associates 12	Venture Capital	35,000,000	35,631,130	46,183,149	4,400,504	14,952,523	1.4x	6.8%	Second	Second
2006	NewSpring Growth Capital II	Venture Capital	10,000,000	9,850,000	14,110,084						
2006	OCM Principal Opportunities Fund IV	Special Situations	20,000,000	20,400,000	34,058,279						
2006	Permira IV	Buyout	127,779,198	138,372,478	205,123,986	17,871,837	84,623,345	1.6x	8.6%	Second	Second
2006	TA X	Buyout	70,000,000	69,732,009	91,152,009						
2006	TPG Partners V	Buyout	100,000,000	92,531,812	126,505,064	5,370,057	39,343,309	1.4x	5.0%	Third	Second
<b>2006 Total</b>			<b>\$1,189,779,198</b>	<b>\$1,153,996,478</b>	<b>\$1,937,437,074</b>						
2007	ABRY Advanced Securities Fund	Special Situations	25,000,000	23,508,684	38,682,209						
2007	Advent Latin American Private Equity Fund IV	Buyout	30,000,000	30,797,073	41,165,921	5,929,881	16,298,729	1.5x	9.4%	Second	Second
2007	Asia Alternatives Capital Partners II	Buyout	50,000,000	28,897,883	40,718,603	26,909,660	38,730,380	2.3x	16.9%	First	First
2007	Audax Private Equity Fund III	Buyout	37,000,000	42,498,691	80,644,845	2,649,875	40,796,029	2.0x	15.0%	First	Second
2007	Battery Ventures VIII	Venture Capital	25,000,000	25,050,751	55,636,614						
2007	Dover Street VII	Special Situations	30,000,000	28,696,128	38,734,725	2,554,624	12,593,221	1.4x	9.3%	Second	Third
2007	Insight Venture Partners VI	Venture Capital	30,000,000	32,244,177	81,538,923	413,756	49,708,502	2.5x	19.2%	First	First

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2007	JMI Equity Fund VI	Venture Capital	40,000,000	40,000,246	69,017,467						
2007	Kelso VIII	Buyout	150,000,000	146,298,834	165,748,601	29,141,042	48,590,809	1.3x	6.1%	Third	Third
2007	OCM Opportunities Fund VII	Special Situations	40,000,000	40,000,000	53,673,050						
2007	OCM Opportunities Fund VII b	Special Situations	40,000,000	36,000,000	61,630,635						
2007	Providence Equity Partners VI	Buyout	50,000,000	54,663,181	59,224,369						
2007	TPG Asia V	Buyout	22,500,000	21,964,311	26,609,378	4,314,042	8,959,109	1.4x	6.4%	Third	Third
2007	Weathergag Venture Capital	Venture Capital	25,000,000	22,875,000	32,481,174	15,452,018	25,058,192	2.1x	12.2%	Second	First
<b>2007 Total</b>			<b>\$594,500,000</b>	<b>\$573,494,958</b>	<b>\$845,506,513</b>						
2008	ABRY Partners VI	Buyout	50,000,000	59,994,861	107,608,270						
2008	Advent International GPE VI-A	Buyout	35,000,000	35,146,325	68,452,177	5,535,586	38,841,438	2.1x	16.8%	First	First
2008	Battery Ventures VIII Side Car Fund	Venture Capital	9,000,000	6,803,790	17,449,466						
2008	Great Hill Equity Partners IV	Buyout	25,000,000	25,125,662	59,603,949						
2008	H.I.G. Bayside Debt & LBO Fund II	Special Situations	30,000,000	30,998,253	46,480,928						
2008	Lightspeed Venture Partners VIII	Venture Capital	15,000,000	14,700,000	30,396,409						
2008	LLR Equity Partners III	Buyout	30,000,000	29,108,722	51,222,009	5,891,365	28,004,651	2.0x	15.2%	Second	First
2008	Madison Dearborn Capital Partners VI	Buyout	50,000,000	51,152,821	85,983,774	26,371,984	61,202,937	2.2x	23.7%	First	First
2008	TPG Partners VI	Buyout	45,000,000	50,114,305	65,499,008	10,385,258	25,769,961	1.5x	10.2%	Second	Second
<b>2008 Total</b>			<b>\$289,000,000</b>	<b>\$303,144,740</b>	<b>\$532,695,991</b>						
2010	Advent Latin American Private Equity Fund V	Buyout	15,000,000	14,430,000	7,650,000	9,177,103	2,397,103	1.2x	3.1%	Fourth	Fourth
2010	Avenue Special Situations Fund VI	Special Situations	20,000,000	20,068,464	20,720,289						
2010	Oaktree Power Opportunities Fund III	Buyout	25,000,000	18,453,089	23,437,650						
2010	OCM Opportunities Fund VIII	Special Situations	12,500,000	12,583,425	17,546,905						
2010	OCM Opportunities Fund VIIIb	Special Situations	12,500,000	12,500,000	12,750,127						
2010	Weathergag Venture Capital II	Venture Capital	25,000,000	23,250,000	16,779,957	39,200,987	32,730,944	2.4x	15.7%	Second	First
<b>2010 Total</b>			<b>\$110,000,000</b>	<b>\$101,284,978</b>	<b>\$98,884,930</b>						

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2011	ABRY Partners VII	Buyout	30,000,000	37,911,447	48,786,607						
2011	Asia Alternatives Korea Buyout Investors (Hahn & Co)	Buyout	7,000,000	8,698,039	9,137,898	5,725,476	6,165,335	1.7x	13.0%	Third	Second
2011	Berkshire Fund VIII	Buyout	30,000,000	30,644,097	29,785,272						
2011	Francisco Partners III	Buyout	20,000,000	20,514,684	33,151,148	15,367,418	28,003,882	2.4x	20.7%	Second	First
2011	H.I.G. Growth Buyouts & Equity Fund II	Buyout	15,000,000	15,000,000	4,086,778						
2011	Insight Venture Partners VII	Venture Capital	20,000,000	21,319,992	43,195,215	15,412,776	37,288,000	2.7x	21.6%	Second	First
2011	JMI Equity Fund VII	Venture Capital	10,000,000	9,780,000	12,440,582						
2011	Meritech Capital Partners IV	Venture Capital	20,000,000	19,400,000	28,958,360						
<b>2011 Total</b>			<b>\$152,000,000</b>	<b>\$163,268,259</b>	<b>\$209,541,860</b>						
2012	Advent International GPE VII-B	Buyout	40,000,000	37,600,000	36,462,734	31,816,303	30,679,037	1.8x	15.7%	Second	Second
2012	Asia Alternatives Capital Partners III	Buyout	50,000,000	53,645,294	39,227,988	43,993,707	29,576,401	1.6x	12.3%	Third	Third
2012	AXA Secondary Fund V B	Special Situations	75,000,000	61,682,742	96,790,691						
2012	Carlyle Energy Mezzanine Opportunities Fund	Buyout	50,000,000	65,066,381	31,410,748	10,303,673	(23,351,960)	0.6x	(17.7%)	Fourth	Fourth
2012	NewSpring Growth Capital III	Venture Capital	25,000,000	23,580,605	11,955,766						
2012	Penn Asia Investors	Buyout	133,000,000	84,785,293	40,477,040	91,733,113	47,424,860	1.6x	15.1%	Second	Third
<b>2012 Total</b>			<b>\$373,000,000</b>	<b>\$326,360,315</b>	<b>\$256,324,967</b>						
2013	Eureka Growth Capital III	Buyout	20,000,000	14,893,524	13,614,722	13,391,290	12,112,488	1.8x	43.4%	First	Second
2013	FSN Capital IV	Buyout	46,049,703	37,755,593	49,991,515						
2013	H.I.G. Bayside Loan Opp. Fund III	Special Situations	50,000,000	40,418,122	36,557,163						
2013	Incline Equity Partners III	Buyout	15,000,000	15,701,555	25,901,448	11,538,061	21,737,954	2.4x	33.7%	First	First
2013	Insight Venture Partners VIII	Venture Capital	50,000,000	52,250,000	67,015,119	50,417,338	65,182,457	2.2x	18.6%	Second	First
2013	LBC Credit Partners III	Special Situations	50,000,000	46,696,253	46,434,310				8.3%	Third	
2013	Oaktree Opportunities Fund IX	Special Situations	50,000,000	50,000,000	23,947,715						
2013	Platinum Equity Capital Partners III	Special Situations	50,000,000	47,933,134	61,882,485	26,474,537	40,423,888	1.8x	38.9%	First	First

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
<b>2013 Total</b>			<b>\$331,049,703</b>	<b>\$305,648,180</b>	<b>\$325,344,477</b>						
2014	Capvis Equity IV	Buyout	49,855,591	42,153,784	33,984,236	16,358,659	8,189,112				
2014	GTCR Fund XI	Buyout	25,000,000	22,712,831	17,886,190				27.0%	First	
2014	H.I.G. Europe Capital Partners II	Buyout	27,544,596	16,364,744	4,172,985						
2014	Hahn & Company II	Buyout	50,000,000	49,797,659	9,040,888						
2014	Horizon Impact Fund	Buyout	50,000,000	42,129,802	20,795,776	42,802,411	21,468,385	1.5x	16.5%	Second	Second
2014	Horizon Strategic Fund - Carlyle Group	Buyout	100,000,000	86,306,150	37,610,457	85,926,209	37,230,516	1.4x	10.5%	Third	Third
2014	KPS Special Situations Fund IV	Special Situations	25,000,000	20,881,495	7,217,423	18,000,100	4,336,029	1.2x	16.8%	Second	Fourth
2014	LLR Equity Partners IV	Buyout	50,000,000	45,485,764	51,631,579	43,095,146	49,240,961	2.1x	27.5%	First	First
2014	Meritech Capital Partners V	Venture Capital	23,000,000	21,332,500	14,003,382						
2014	Sentinel Capital Partners V	Buyout	10,000,000	10,043,414	5,637,708	8,802,325	4,396,619	1.4x	15.3%	Second	Third
<b>2014 Total</b>			<b>\$410,400,187</b>	<b>\$357,208,142</b>	<b>\$201,980,624</b>						
2015	ABRY Partners VIII	Buyout	25,000,000	29,073,937	15,354,530						
2015	ADV Opportunities Fund I	Special Situations	50,000,000	55,134,043	7,700,133	56,471,239	9,037,329	1.2x	5.3%	Fourth	Fourth
2015	Advent Latin American Private Equity Fund VI	Buyout	25,000,000	18,925,000	5,000,000	20,458,426	6,533,426	1.3x	17.3%	Second	Third
2015	Centerbridge Capital Partners III	Special Situations	30,000,000	24,542,638	10,159,141	23,515,924	9,132,427	1.4x	16.4%	Second	Second
2015	Clearlake Capital Partners IV	Special Situations	15,000,000	20,129,171	13,900,669	19,052,360	12,823,858	1.6x	31.5%	First	First
2015	Francisco Partners IV	Buyout	25,000,000	24,656,280	20,313,694	32,609,927	28,267,341	2.1x	29.7%	First	First
2015	H.I.G. Bayside Loan Opp. Fund IV	Special Situations	25,000,000	18,608,621	11,970,959						
2015	H.I.G. Brazil and Latin America Partners	Buyout	50,000,000	20,988,594	9,139						
2015	Insight Venture Partners IX	Venture Capital	50,000,000	49,250,000	8,503,088	103,269,180	62,522,269	2.3x	29.0%	First	First
2015	JMI Equity Fund VIII	Venture Capital	25,000,000	26,600,000	12,295,288						
2015	Lightspeed India Partners I	Venture Capital	15,000,000	13,155,000	1,576,000						
2015	Primavera Capital Fund II	Buyout	50,000,000	52,723,290	6,476,493						
2015	Ridgemont Equity Partners II	Buyout	50,000,000	48,028,260	21,510,770						

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2015	RRJ Capital Master Fund III	Special Situations	50,000,000	37,820,242	31,823,014	18,661,016	12,663,788	1.3x	15.5%	Second	Third
<b>2015 Total</b>			<b>\$485,000,000</b>	<b>\$439,635,075</b>	<b>\$166,592,918</b>						
2016	Advent International GPE VIII-B	Buyout	50,000,000	44,475,000	-	NM	NM	NM	NM	NM	NM
2016	ASF VII B	Special Situations	100,000,000	44,812,080	9,537,234						
2016	ASF VII PA Co-Invest	Special Situations	50,000,000	24,138,733	3,193,613						
2016	Audax Private Equity Fund V	Buyout	50,000,000	38,611,369	15,078,628	39,500,045	15,967,304	1.4x	20.9%	Second	Second
2016	Blackstone Capital Partners VII	Buyout	50,000,000	38,956,190	4,454,897	NM	NM	NM	NM	NM	NM
2016	Hellman & Friedman Capital Partners VIII	Buyout	50,000,000	50,283,461	4,936,396	NM	NM	NM	NM	NM	NM
2016	Providence Strategic Growth II	Venture Capital	60,000,000	66,919,495	44,554,321	NM	NM	NM	NM	NM	NM
2016	Sterling Group Partners IV	Buyout	20,000,000	15,377,741	782,698	18,575,381	3,980,338	1.3x	13.1%	Third	Second
2016	Vista Equity Partners Fund VI	Buyout	150,000,000	165,007,379	35,980,028	NM	NM	NM	NM	NM	NM
<b>2016 Total</b>			<b>\$580,000,000</b>	<b>\$488,581,448</b>	<b>\$118,517,816</b>						
2017	Asia Alternatives Capital Partners V	Buyout	50,000,000	13,271,220	288,395	NM	NM	NM	NM	NM	NM
2017	FSN Capital V	Buyout	77,189,328	55,000,341	7,278,360	NM	NM	NM	NM	NM	NM
2017	Horizon Impact Fund B	Buyout	100,000,000	45,750,000	-	NM	NM	NM	NM	NM	NM
2017	Permira VI	Buyout	56,202,000	44,369,051	-	NM	NM	NM	NM	NM	NM
2017	Wind Point Partners VIII	Buyout	100,000,000	88,064,435	48,554,180	NM	NM	NM	NM	NM	NM
<b>2017 Total</b>			<b>\$383,391,328</b>	<b>\$246,455,047</b>	<b>\$56,120,935</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>
2018	Clearlake Capital Partners V	Special Situations	55,000,000	40,259,629	7,539,631	NM	NM	NM	NM	NM	NM
2018	CVC Capital Partners VII	Buyout	91,202,040	46,139,787	390,578	NM	NM	NM	NM	NM	NM
2018	GTCR Fund XII	Buyout	32,500,000	10,078,250	585,073	NM	NM	NM	NM	NM	NM
2018	Hahn & Company III	Buyout	56,250,000	9,704,001	83,933	NM	NM	NM	NM	NM	NM
2018	Hahn & Company III - Supplemental Fund	Buyout	18,750,000	5,944,175	57,377	NM	NM	NM	NM	NM	NM
2018	Insight Venture Partners X	Venture Capital	100,000,000	82,500,000	34,245	NM	NM	NM	NM	NM	NM
2018	Keystone Legacy Fund	Keystone Legacy Fund	200,000,000	5,580,286,826	7,003,474,670	745,134,463	2,168,322,307	1.4x	5.9%	NM	NM

**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2018	LLR Equity Partners V	Buyout	75,000,000	45,976,042	6,778,610	NM	NM	NM	NM	NM	NM
2018	NGP Keystone	Buyout	25,000,000	-	-	NM	NM	NM	NM	NM	NM
2018	NGP XII	Buyout	75,000,000	35,500,629	113,471	NM	NM	NM	NM	NM	NM
2018	Providence Strategic Growth III	Venture Capital	75,000,000	54,604,349	10,950,929	NM	NM	NM	NM	NM	NM
2018	Silver Lake Partners V	Buyout	78,000,000	35,950,583	573,513	NM	NM	NM	NM	NM	NM
2018	TDR Capital IV	Buyout	83,638,400	4,099,315	-	NM	NM	NM	NM	NM	NM
<b>2018 Total</b>			<b>\$965,340,440</b>	<b>\$5,951,043,585</b>	<b>\$7,030,582,029</b>						
2019	Apollo Investment Fund IX	Buyout	85,400,000	16,006,361	159,233	NM	NM	NM	NM	NM	NM
2019	Ares PA Opportunities Fund, L.P. - Special Situations	Special Situations	100,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	ASF VIII B	Special Situations	100,000,000	6,690,132	293	NM	NM	NM	NM	NM	NM
2019	ASF VIII PA Co-Invest	Special Situations	50,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	Audax Private Equity Fund VI	Buyout	75,000,000	7,076,819	1,002,199	NM	NM	NM	NM	NM	NM
2019	Blackstone Capital Partners VIII	Buyout	70,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	Clearlake Capital Partners VI	Special Situations	60,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	Hellman & Friedman Capital Partners IX	Buyout	90,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	Insight Venture Partners XI	Venture Capital	75,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	KPS Special Situations Fund V	Special Situations	75,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	KPS Special Situations Mid-Cap Fund	Special Situations	25,000,000	2,199,829	-	NM	NM	NM	NM	NM	NM
2019	Permira VII	Buyout	76,240,328	-	-	NM	NM	NM	NM	NM	NM
2019	Primavera Capital Fund III	Buyout	75,000,000	49,994,290	291,169	NM	NM	NM	NM	NM	NM
2019	Providence Strategic Growth IV	Venture Capital	75,000,000	-	-	NM	NM	NM	NM	NM	NM
2019	TCV X	Venture Capital	75,000,000	24,735,000	-	NM	NM	NM	NM	NM	NM
2019	Thoma Bravo Fund XIII	Buyout	75,000,000	27,077,759	303	NM	NM	NM	NM	NM	NM
2019	TSG8	Buyout	100,000,000	2,620,598	-	NM	NM	NM	NM	NM	NM
2019	Vista Equity Partners Fund VII	Buyout	75,000,000	18,386,617	54,289	NM	NM	NM	NM	NM	NM



**Commonwealth of Pennsylvania State Employees' Retirement System**

Schedule of Active Investments by Vintage Year

As of December 31, 2019

VINTAGE	FUND	SECTOR	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
2019	Wind Point Partners IX-A	Buyout	75,000,000	562,500	-	NM	NM	NM	NM	NM	NM
<b>2019 Total</b>			<b>\$1,431,640,328</b>	<b>\$155,349,905</b>	<b>\$1,507,486</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>	<b>NM</b>
Total: Active Investments			<b>\$9,147,061,183</b>	<b>\$12,354,867,304</b>	<b>\$15,087,491,112</b>	<b>\$4,007,002,648</b>	<b>\$6,739,626,455</b>	<b>1.5x</b>	<b>9.3%</b>	<b>Second</b>	<b>Second</b>
Total: Liquidated Investments			<b>\$4,406,870,750</b>	<b>\$4,306,132,693</b>	<b>\$7,597,203,347</b>	<b>-</b>	<b>\$3,291,070,653</b>	<b>1.8x</b>	<b>16.0%</b>	<b>First</b>	<b>Second</b>
Total: Commonwealth of Pennsylvania State Employees' Retirement System			<b>\$13,553,931,933</b>	<b>\$16,660,999,998</b>	<b>\$22,684,694,459</b>	<b>\$4,007,002,648</b>	<b>\$10,030,697,108</b>	<b>1.6x</b>	<b>12.2%</b>	<b>Second</b>	<b>Second</b>

1. Commitment reflects original commitment including fx fluctuations for non-usd funds.

2. Contributions includes management fees and expenses.

3. Gain/Loss represents the since inception total value change.

4. Fund quartile rankings provided by Burgiss Private iQ as of December 31, 2019, and represents sector-comparable funds aggregated by vintage year, asset class and geography, with special situation funds benchmarked to All Private Equity. Total Buyout, Venture Capital and Special Situations are benchmarked by sector-comparable funds, which includes vintages in which SERS made commitments. Vintage year benchmarks compares Burgiss Private iQ vintage year by Global All Private Equity Benchmarks.

NM - Not Meaningful

Note: Keystone Legacy Fund performance represents since inception returns for all non-core funds combined and contributions and distributions reflect since inception cash flows for the non-core portfolio.

These figures have been prepared by Stepstone on behalf of SERS and have not been provided by any General Partner.

Past performance is not necessarily indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

## Exhibit B – Investments by Sector

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	ABRY Partners IV	2000	\$35,000,000	\$25,497,290	\$74,633,973						
Buyout	ABRY Partners V	2004	45,000,000	41,752,543	83,342,348						
Buyout	ABRY Partners VI	2008	50,000,000	59,994,861	107,608,270						
Buyout	ABRY Partners VII	2011	30,000,000	37,911,447	48,786,607						
Buyout	ABRY Partners VIII	2015	25,000,000	29,073,937	15,354,530						
Buyout	Advent International GPE VI-A	2008	35,000,000	35,146,325	68,452,177	5,535,586	38,841,438	2.1x	16.8%	First	First
Buyout	Advent International GPE VII-B	2012	40,000,000	37,600,000	36,462,734	31,816,303	30,679,037	1.8x	15.7%	Second	Second
Buyout	Advent International GPE VIII-B	2016	50,000,000	44,475,000	-	NM	NM	NM	NM	NM	NM
Buyout	Advent Latin American Private Equity Fund IV	2007	30,000,000	30,797,073	41,165,921	5,929,881	16,298,729	1.5x	9.4%	Second	Second
Buyout	Advent Latin American Private Equity Fund V	2010	15,000,000	14,430,000	7,650,000	9,177,103	2,397,103	1.2x	3.1%	Fourth	Fourth
Buyout	Advent Latin American Private Equity Fund VI	2015	25,000,000	18,925,000	5,000,000	20,458,426	6,533,426	1.3x	17.3%	Second	Third
Buyout	Apollo Investment Fund IV	1997	75,000,000	74,838,620	124,814,033	85,233	50,060,646	1.7x	8.5%	Second	Second
Buyout	Apollo Investment Fund IX	2019	85,400,000	16,006,361	159,233	NM	NM	NM	NM	NM	NM
Buyout	Apollo Investment Fund V	2000	50,000,000	44,972,146	122,673,016	434,338	78,135,208	2.7x	38.8%	First	First
Buyout	Apollo Investment Fund VI	2005	40,000,000	38,911,805	64,467,407	761,724	26,317,325	1.7x	8.7%	Second	Second
Buyout	Asia Alternatives Capital Partners	2006	50,000,000	25,190,942	42,170,806	3,251,550	20,231,414	1.8x	10.9%	Second	First

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	Asia Alternatives Capital Partners II	2007	50,000,000	28,897,883	40,718,603	26,909,660	38,730,380	2.3x	16.9%	First	First
Buyout	Asia Alternatives Capital Partners III	2012	50,000,000	53,645,294	39,227,988	43,993,707	29,576,401	1.6x	12.3%	Third	Third
Buyout	Asia Alternatives Capital Partners V	2017	50,000,000	13,271,220	288,395	NM	NM	NM	NM	NM	NM
Buyout	Asia Alternatives Korea Buyout Investors (Hahn & Co)	2011	7,000,000	8,698,039	9,137,898	5,725,476	6,165,335	1.7x	13.0%	Third	Second
Buyout	Audax Private Equity Fund	2000	35,000,000	36,839,098	56,057,910	125,194	19,344,006	1.5x	13.1%	Second	Second
Buyout	Audax Private Equity Fund II	2005	25,000,000	25,517,152	46,325,622	231,933	21,040,403	1.8x	14.1%	First	Second
Buyout	Audax Private Equity Fund III	2007	37,000,000	42,498,691	80,644,845	2,649,875	40,796,029	2.0x	15.0%	First	Second
Buyout	Audax Private Equity Fund V	2016	50,000,000	38,611,369	15,078,628	39,500,045	15,967,304	1.4x	20.9%	Second	Second
Buyout	Audax Private Equity Fund VI	2019	75,000,000	7,076,819	1,002,199	NM	NM	NM	NM	NM	NM
Buyout	Berkshire Fund VI	2002	20,000,000	18,819,615	54,873,734						
Buyout	Berkshire Fund VII	2006	32,000,000	32,613,861	68,126,503						
Buyout	Berkshire Fund VIII	2011	30,000,000	30,644,097	29,785,272						
Buyout	Blackstone Capital IV	2001	75,000,000	69,119,097	192,546,094	1,860,115	125,287,112	2.8x	36.2%	First	First
Buyout	Blackstone Capital Partners V	2006	150,000,000	150,111,788	242,154,335	6,809,598	98,852,145	1.7x	7.6%	Second	Second
Buyout	Blackstone Capital Partners VII	2016	50,000,000	38,956,190	4,454,897	NM	NM	NM	NM	NM	NM
Buyout	Blackstone Capital Partners VIII	2019	70,000,000	-	-	NM	NM	NM	NM	NM	NM

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	Blackstone Communications Partners I	2000	25,000,000	25,114,042	30,998,189	166,401	6,050,548	1.2x	6.2%	Second	Second
Buyout	Capvis Equity IV	2014	49,855,591	42,153,784	33,984,236	16,358,659	8,189,112				
Buyout	Carlyle Energy Mezzanine Opportunities Fund	2012	50,000,000	65,066,381	31,410,748	10,303,673	(23,351,960)	0.6x	(17.7%)	Fourth	Fourth
Buyout	CVC Capital Partners VII	2018	91,202,040	46,139,787	390,578	NM	NM	NM	NM	NM	NM
Buyout	Eureka Growth Capital III	2013	20,000,000	14,893,524	13,614,722	13,391,290	12,112,488	1.8x	43.4%	First	Second
Buyout	Eureka II	2006	20,000,000	21,884,526	20,777,356	6,732,704	5,625,534	1.3x	4.6%	Third	Third
Buyout	Francisco Partners II	2006	30,000,000	29,383,916	41,240,515	4,754,458	16,611,056	1.6x	10.0%	Second	Second
Buyout	Francisco Partners III	2011	20,000,000	20,514,684	33,151,148	15,367,418	28,003,882	2.4x	20.7%	Second	First
Buyout	Francisco Partners IV	2015	25,000,000	24,656,280	20,313,694	32,609,927	28,267,341	2.1x	29.7%	First	First
Buyout	FSN Capital IV	2013	46,049,703	37,755,593	49,991,515						
Buyout	FSN Capital V	2017	77,189,328	55,000,341	7,278,360	NM	NM	NM	NM	NM	NM
Buyout	Great Hill Equity Partners IV	2008	25,000,000	25,125,662	59,603,949						
Buyout	GTCR Fund XI	2014	25,000,000	22,712,831	17,886,190				27.0%	First	
Buyout	GTCR Fund XII	2018	32,500,000	10,078,250	585,073	NM	NM	NM	NM	NM	NM
Buyout	GTCR IX	2006	50,000,000	47,916,718	86,149,702				13.7%	First	
Buyout	GTCR VIII	2002	75,000,000	69,393,599	120,471,948				22.3%	Second	

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	H.I.G. Brazil and Latin America Partners	2015	50,000,000	20,988,594	9,139						
Buyout	H.I.G. Europe Capital Partners II	2014	27,544,596	16,364,744	4,172,985						
Buyout	H.I.G. Growth Buyouts & Equity Fund II	2011	15,000,000	15,000,000	4,086,778						
Buyout	Hahn & Company II	2014	50,000,000	49,797,659	9,040,888						
Buyout	Hahn & Company III	2018	56,250,000	9,704,001	83,933	NM	NM	NM	NM	NM	NM
Buyout	Hahn & Company III - Supplemental Fund	2018	18,750,000	5,944,175	57,377	NM	NM	NM	NM	NM	NM
Buyout	HarbourVest IPEP III	1998	40,000,000	39,400,000	61,092,165	79,937	21,772,102	1.6x	8.6%	Second	Second
Buyout	Hellman & Friedman Capital Partners IX	2019	90,000,000	-	-	NM	NM	NM	NM	NM	NM
Buyout	Hellman & Friedman Capital Partners VI	2006	125,000,000	119,913,412	218,914,920	6,388,246	105,389,754	1.9x	12.9%	First	First
Buyout	Hellman & Friedman Capital Partners VIII	2016	50,000,000	50,283,461	4,936,396	NM	NM	NM	NM	NM	NM
Buyout	HIPEP V-Asia Pacific & Rest of World	2005	30,000,000	28,245,316	35,192,128	5,570,159	12,516,971	1.4x	6.2%	Third	Second
Buyout	Horizon Impact Fund	2014	50,000,000	42,129,802	20,795,776	42,802,411	21,468,385	1.5x	16.5%	Second	Second
Buyout	Horizon Impact Fund B	2017	100,000,000	45,750,000	-	NM	NM	NM	NM	NM	NM
Buyout	Horizon Strategic Fund - Carlyle Group	2014	100,000,000	86,306,150	37,610,457	85,926,209	37,230,516	1.4x	10.5%	Third	Third
Buyout	Incline Equity Partners III	2013	15,000,000	15,701,555	25,901,448	11,538,061	21,737,954	2.4x	33.7%	First	First
Buyout	Kelso VII	2003	40,000,000	41,169,937	65,821,118	351,863	25,003,044	1.6x	11.4%	Second	Second

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	Kelso VIII	2007	150,000,000	146,298,834	165,748,601	29,141,042	48,590,809	1.3x	6.1%	Third	Third
Buyout	LLR Equity Partners II	2004	25,000,000	25,000,000	44,945,591	294,505	20,240,096	1.8x	12.2%	Second	Second
Buyout	LLR Equity Partners III	2008	30,000,000	29,108,722	51,222,009	5,891,365	28,004,651	2.0x	15.2%	Second	First
Buyout	LLR Equity Partners IV	2014	50,000,000	45,485,764	51,631,579	43,095,146	49,240,961	2.1x	27.5%	First	First
Buyout	LLR Equity Partners V	2018	75,000,000	45,976,042	6,778,610	NM	NM	NM	NM	NM	NM
Buyout	Madison Dearborn Capital Partners IV	2000	90,000,000	90,365,390	169,072,775	3,152,986	81,860,370	1.9x	14.1%	First	First
Buyout	Madison Dearborn Capital Partners V	2006	75,000,000	71,556,584	113,632,910	1,670,940	43,747,266	1.6x	7.2%	Second	Second
Buyout	Madison Dearborn Capital Partners VI	2008	50,000,000	51,152,821	85,983,774	26,371,984	61,202,937	2.2x	23.7%	First	First
Buyout	Newbridge Asia IV	2005	40,000,000	38,903,378	85,845,344						
Buyout	NGP Keystone	2018	25,000,000	-	-	NM	NM	NM	NM	NM	NM
Buyout	NGP XII	2018	75,000,000	35,500,629	113,471	NM	NM	NM	NM	NM	NM
Buyout	Oaktree Power Opportunities Fund III	2010	25,000,000	18,453,089	23,437,650						
Buyout	OCM/GFI Power Opportunities Fund II	2005	25,000,000	13,470,852	41,644,215						
Buyout	Penn Asia Investors	2012	133,000,000	84,785,293	40,477,040	91,733,113	47,424,860	1.6x	15.1%	Second	Third
Buyout	Permira European Fund II	2000	48,000,000	45,672,612	91,560,959	304,702	46,193,050	2.0x	21.6%	First	First
Buyout	Permira European Fund III	2003	115,960,000	127,340,454	217,911,944	482,003	91,053,493	1.7x	26.1%	First	Second

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	Permira IV	2006	127,779,198	138,372,478	205,123,986	17,871,837	84,623,345	1.6x	8.6%	Second	Second
Buyout	Permira VI	2017	56,202,000	44,369,051	-	NM	NM	NM	NM	NM	NM
Buyout	Permira VII	2019	76,240,328	-	-	NM	NM	NM	NM	NM	NM
Buyout	Primavera Capital Fund II	2015	50,000,000	52,723,290	6,476,493						
Buyout	Primavera Capital Fund III	2019	75,000,000	49,994,290	291,169	NM	NM	NM	NM	NM	NM
Buyout	Providence Equity Partners IV	2000	25,000,000	23,420,840	56,065,270						
Buyout	Providence Equity Partners V	2004	45,000,000	42,692,171	51,743,883						
Buyout	Providence Equity Partners VI	2007	50,000,000	54,663,181	59,224,369						
Buyout	Ridgemont Equity Partners II	2015	50,000,000	48,028,260	21,510,770						
Buyout	Sentinel Capital Partners V	2014	10,000,000	10,043,414	5,637,708	8,802,325	4,396,619	1.4x	15.3%	Second	Third
Buyout	Silver Lake Partners V	2018	78,000,000	35,950,583	573,513	NM	NM	NM	NM	NM	NM
Buyout	Sterling Group Partners IV	2016	20,000,000	15,377,741	782,698	18,575,381	3,980,338	1.3x	13.1%	Third	Second
Buyout	TA X	2006	70,000,000	69,732,009	91,152,009						
Buyout	TDR Capital IV	2018	83,638,400	4,099,315	-	NM	NM	NM	NM	NM	NM
Buyout	Thoma Bravo Fund XIII	2019	75,000,000	27,077,759	303	NM	NM	NM	NM	NM	NM
Buyout	TPG Asia V	2007	22,500,000	21,964,311	26,609,378	4,314,042	8,959,109	1.4x	6.4%	Third	Third



Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Buyout	TPG Partners III	1999	75,000,000	64,119,169	165,990,273						
Buyout	TPG Partners IV	2003	30,000,000	27,981,463	57,968,285						
Buyout	TPG Partners V	2006	100,000,000	92,531,812	126,505,064	5,370,057	39,343,309	1.4x	5.0%	Third	Second
Buyout	TPG Partners VI	2008	45,000,000	50,114,305	65,499,008	10,385,258	25,769,961	1.5x	10.2%	Second	Second
Buyout	TSG8	2019	100,000,000	2,620,598	-	NM	NM	NM	NM	NM	NM
Buyout	Vista Equity Partners Fund VI	2016	150,000,000	165,007,379	35,980,028	NM	NM	NM	NM	NM	NM
Buyout	Vista Equity Partners Fund VII	2019	75,000,000	18,386,617	54,289	NM	NM	NM	NM	NM	NM
Buyout	Wind Point Partners IX-A	2019	75,000,000	562,500	-	NM	NM	NM	NM	NM	NM
Buyout	Wind Point Partners VIII	2017	100,000,000	88,064,435	48,554,180	NM	NM	NM	NM	NM	NM
<b>Buyout Total</b>			<b>\$5,702,061,183</b>	<b>\$4,332,299,721</b>	<b>\$4,994,476,557</b>	<b>\$1,987,780,130</b>	<b>\$2,649,956,967</b>	<b>1.6x</b>	<b>14.0%</b>	<b>Second</b>	<b>Second</b>
Keystone Legacy Fund	Keystone Legacy Fund	2018	200,000,000	5,580,286,826	7,003,474,670	745,134,463	2,168,322,307	1.4x	5.9%	NM	NM
<b>Keystone Legacy Fund Total</b>			<b>\$200,000,000</b>	<b>\$5,580,286,826</b>	<b>\$7,003,474,670</b>	<b>\$745,134,463</b>	<b>\$2,168,322,307</b>	<b>1.4x</b>	<b>5.9%</b>	<b>NM</b>	<b>NM</b>
Special Situations	ABRY Advanced Securities Fund	2007	25,000,000	23,508,684	38,682,209						
Special Situations	ABRY Mezzanine Partners	2001	30,000,000	26,731,187	49,707,116						
Special Situations	ABRY Senior Equity II	2006	30,000,000	28,282,103	44,960,375						
Special Situations	ADV Opportunities Fund I	2015	50,000,000	55,134,043	7,700,133	56,471,239	9,037,329	1.2x	5.3%	Fourth	Fourth
Special Situations	Ares PA Opportunities Fund, L.P. - Special Situations	2019	100,000,000	-	-	NM	NM	NM	NM	NM	NM

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Special Situations	ASF VII B	2016	100,000,000	44,812,080	9,537,234						
Special Situations	ASF VII PA Co-Invest	2016	50,000,000	24,138,733	3,193,613						
Special Situations	ASF VIII B	2019	100,000,000	6,690,132	293	NM	NM	NM	NM	NM	NM
Special Situations	ASF VIII PA Co-Invest	2019	50,000,000	-	-	NM	NM	NM	NM	NM	NM
Special Situations	Avenue Special Situations Fund VI	2010	20,000,000	20,068,464	20,720,289						
Special Situations	AXA Secondary Fund III	2004	26,000,000	21,737,894	37,244,706						
Special Situations	AXA Secondary Fund III-2	2004	14,000,000	11,677,210	19,062,764						
Special Situations	AXA Secondary Fund IV	2006	80,000,000	70,134,752	99,186,788						
Special Situations	AXA Secondary Fund V B	2012	75,000,000	61,682,742	96,790,691						
Special Situations	Centerbridge Capital Partners I	2006	50,000,000	57,490,446	113,475,526	6,606,904	62,591,984	2.1x	19.4%	First	First
Special Situations	Centerbridge Capital Partners III	2015	30,000,000	24,542,638	10,159,141	23,515,924	9,132,427	1.4x	16.4%	Second	Second
Special Situations	Clearlake Capital Partners IV	2015	15,000,000	20,129,171	13,900,669	19,052,360	12,823,858	1.6x	31.5%	First	First
Special Situations	Clearlake Capital Partners V	2018	55,000,000	40,259,629	7,539,631	NM	NM	NM	NM	NM	NM
Special Situations	Clearlake Capital Partners VI	2019	60,000,000	-	-	NM	NM	NM	NM	NM	NM
Special Situations	Dover Street VII	2007	30,000,000	28,696,128	38,734,725	2,554,624	12,593,221	1.4x	9.3%	Second	Third
Special Situations	H.I.G. Bayside Debt & LBO Fund II	2008	30,000,000	30,998,253	46,480,928						

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Special Situations	H.I.G. Bayside Loan Opp. Fund III	2013	50,000,000	40,418,122	36,557,163						
Special Situations	H.I.G. Bayside Loan Opp. Fund IV	2015	25,000,000	18,608,621	11,970,959						
Special Situations	KPS Special Situations Fund IV	2014	25,000,000	20,881,495	7,217,423	18,000,100	4,336,029	1.2x	16.8%	Second	Fourth
Special Situations	KPS Special Situations Fund V	2019	75,000,000	-	-	NM	NM	NM	NM	NM	NM
Special Situations	KPS Special Situations Mid-Cap Fund	2019	25,000,000	2,199,829	-	NM	NM	NM	NM	NM	NM
Special Situations	LBC Credit Partners III	2013	50,000,000	46,696,253	46,434,310				8.3%	Third	
Special Situations	Lexington Capital Partners III	1999	35,000,000	34,516,449	43,363,378						
Special Situations	Lexington Capital Partners V	2001	75,000,000	74,623,418	125,170,164						
Special Situations	Lexington Capital Partners VI	2005	50,000,000	53,066,325	69,991,523						
Special Situations	Oaktree Capital Management	2004	40,000,000	40,582,060	204,520,995						
Special Situations	Oaktree Opportunities Fund IX	2013	50,000,000	50,000,000	23,947,715						
Special Situations	OCM Opportunities Fund V	2004	40,000,000	40,003,507	65,911,274						
Special Situations	OCM Opportunities Fund VI	2005	40,000,000	40,000,000	63,171,009						
Special Situations	OCM Opportunities Fund VII	2007	40,000,000	40,000,000	53,673,050						
Special Situations	OCM Opportunities Fund VII b	2007	40,000,000	36,000,000	61,630,635						
Special Situations	OCM Opportunities Fund VIII	2010	12,500,000	12,583,425	17,546,905						

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Special Situations	OCM Opportunities Fund VIIIb	2010	12,500,000	12,500,000	12,750,127						
Special Situations	OCM Principal Opportunities Fund IV	2006	20,000,000	20,400,000	34,058,279						
Special Situations	Platinum Equity Capital Partners III	2013	50,000,000	47,933,134	61,882,485	26,474,537	40,423,888	1.8x	38.9%	First	First
Special Situations	RRJ Capital Master Fund III	2015	50,000,000	37,820,242	31,823,014	18,661,016	12,663,788	1.3x	15.5%	Second	Third
<b>Special Situations Total</b>			<b>\$1,825,000,000</b>	<b>\$1,265,547,169</b>	<b>\$1,628,697,239</b>	<b>\$528,176,876</b>	<b>\$891,326,946</b>	<b>1.7x</b>	<b>15.3%</b>	<b>First</b>	<b>First</b>
Venture Capital	Battery Ventures VIII	2007	25,000,000	25,050,751	55,636,614						
Venture Capital	Battery Ventures VIII Side Car Fund	2008	9,000,000	6,803,790	17,449,466						
Venture Capital	HarbourVest Partners VI	1999	200,000,000	196,586,055	251,156,017	963,720	55,533,682	1.3x	3.6%	Second	Second
Venture Capital	HarbourVest Partners VII	2003	75,000,000	73,687,500	106,931,137	12,701,280	45,944,917	1.6x	6.9%	Third	Second
Venture Capital	HarbourVest Partners VIII	2006	100,000,000	98,000,000	138,723,762	50,156,467	90,880,229	1.9x	10.7%	Second	First
Venture Capital	Insight Venture Partners IX	2015	50,000,000	49,250,000	8,503,088	103,269,180	62,522,269	2.3x	29.0%	First	First
Venture Capital	Insight Venture Partners VI	2007	30,000,000	32,244,177	81,538,923	413,756	49,708,502	2.5x	19.2%	First	First
Venture Capital	Insight Venture Partners VII	2011	20,000,000	21,319,992	43,195,215	15,412,776	37,288,000	2.7x	21.6%	Second	First
Venture Capital	Insight Venture Partners VIII	2013	50,000,000	52,250,000	67,015,119	50,417,338	65,182,457	2.2x	18.6%	Second	First
Venture Capital	Insight Venture Partners X	2018	100,000,000	82,500,000	34,245	NM	NM	NM	NM	NM	NM
Venture Capital	Insight Venture Partners XI	2019	75,000,000	-	-	NM	NM	NM	NM	NM	NM
Venture Capital	JMI Equity Fund VI	2007	40,000,000	40,000,246	69,017,467						

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Venture Capital	JMI Equity Fund VII	2011	10,000,000	9,780,000	12,440,582						
Venture Capital	JMI Equity Fund VIII	2015	25,000,000	26,600,000	12,295,288						
Venture Capital	Lightspeed India Partners I	2015	15,000,000	13,155,000	1,576,000						
Venture Capital	Lightspeed Venture Partners VII	2005	18,000,000	18,000,000	49,449,448						
Venture Capital	Lightspeed Venture Partners VIII	2008	15,000,000	14,700,000	30,396,409						
Venture Capital	Meritech Capital Partners III	2006	35,000,000	35,000,000	190,791,007						
Venture Capital	Meritech Capital Partners IV	2011	20,000,000	19,400,000	28,958,360						
Venture Capital	Meritech Capital Partners V	2014	23,000,000	21,332,500	14,003,382						
Venture Capital	New Enterprise Associates 11	2003	25,000,000	25,000,000	62,741,850	3,902,108	41,643,958	2.7x	15.6%	Second	First
Venture Capital	New Enterprise Associates 12	2006	35,000,000	35,631,130	46,183,149	4,400,504	14,952,523	1.4x	6.8%	Second	Second
Venture Capital	New Enterprise Associates IX	1999	20,000,000	19,600,000	7,978,301	1,525,026	(10,096,673)	0.5x	(5.8%)	Third	Fourth
Venture Capital	New Enterprise Associates X	2000	35,000,000	35,028,000	33,995,586	5,974,408	4,941,994	1.1x	2.1%	Third	Third
Venture Capital	NewSpring Growth Capital II	2006	10,000,000	9,850,000	14,110,084						
Venture Capital	NewSpring Growth Capital III	2012	25,000,000	23,580,605	11,955,766						
Venture Capital	Providence Strategic Growth II	2016	60,000,000	66,919,495	44,554,321	NM	NM	NM	NM	NM	NM
Venture Capital	Providence Strategic Growth III	2018	75,000,000	54,604,349	10,950,929	NM	NM	NM	NM	NM	NM

Commonwealth of Pennsylvania State Employees' Retirement System

Schedule of Active Investments by Sector

As of December 31, 2019

SECTOR	FUND	VINTAGE	COMMITMENT <sup>1</sup>	CONTRIBUTIONS <sup>2</sup>	DISTRIBUTIONS	MARKET VALUE	GAIN/LOSS <sup>3</sup>	TVM	IRR	IRR RANK <sup>4</sup>	TVM RANK <sup>4</sup>
Venture Capital	Providence Strategic Growth IV	2019	75,000,000	-	-	NM	NM	NM	NM	NM	NM
Venture Capital	TCV X	2019	75,000,000	24,735,000	-	NM	NM	NM	NM	NM	NM
Venture Capital	Weathergagge Venture Capital	2007	25,000,000	22,875,000	32,481,174	15,452,018	25,058,192	2.1x	12.2%	Second	First
Venture Capital	Weathergagge Venture Capital II	2010	25,000,000	23,250,000	16,779,957	39,200,987	32,730,944	2.4x	15.7%	Second	First
<b>Venture Capital Total</b>			<b>\$1,420,000,000</b>	<b>\$1,176,733,589</b>	<b>\$1,460,842,646</b>	<b>\$745,911,179</b>	<b>\$1,030,020,235</b>	<b>1.9x</b>	<b>10.9%</b>	<b>Second</b>	<b>First</b>
<b>Total: Active Investments</b>			<b>\$9,147,061,183</b>	<b>\$12,354,867,304</b>	<b>\$15,087,491,112</b>	<b>\$4,007,002,648</b>	<b>\$6,739,626,455</b>	<b>1.5x</b>	<b>9.3%</b>	<b>Second</b>	<b>Second</b>
<b>Total: Liquidated Investments</b>			<b>\$4,406,870,750</b>	<b>\$4,306,132,693</b>	<b>\$7,597,203,347</b>	<b>\$0</b>	<b>\$3,291,070,653</b>	<b>1.8x</b>	<b>16.0%</b>	<b>First</b>	<b>Second</b>
<b>Total: Commonwealth of Pennsylvania State Employees' Retirement System</b>			<b>\$13,553,931,933</b>	<b>\$16,660,999,998</b>	<b>\$22,684,694,459</b>	<b>\$4,007,002,648</b>	<b>\$10,030,697,108</b>	<b>1.6x</b>	<b>12.2%</b>	<b>Second</b>	<b>Second</b>

1. Commitment reflects original commitment including fx fluctuations for non-usd funds.

2. Contributions includes management fees and expenses.

3. Gain/Loss represents the since inception total value change.

4. Fund quartile rankings provided by Burgiss Private iQ as of December 31, 2019, and represents sector-comparable funds aggregated by vintage year, asset class and geography, with special situation funds benchmarked to All Private Equity. Total Buyout, Venture Capital and Special Situations are benchmarked by sector-comparable funds, which includes vintages in which SERS made commitments. Vintage year benchmarks compares Burgiss Private iQ vintage year by Global All Private Equity Benchmarks.

NM - Not Meaningful

Note: Keystone Legacy Fund performance represents since inception returns for all non-core funds combined and contributions and distributions reflect since inception cash flows for the non-core portfolio.

These figures have been prepared by Stepstone on behalf of SERS and have not been provided by any General Partner.

**Past performance is not necessarily indicative of future results** and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

**Definitions on Pages 44 -49 - Redacted**