INVESTMENT COMMITTEE MEETING
VIRTUAL

August 25, 2020 at 1:00pm MT

COMMITTEE MEMBERS
Steve Neel, Chair
Dan Mayfield, Vice-Chair
John Melia
Shirley Ragin
Paula Fisher

AGENDA

1. **Roll Call**
2. **Approval of Agenda**
3. **Approval of Consent Agenda**
4. **Current Business**

ITEM		PRESENTER
A	Information Item: Market & Portfolio Update 1. Performance Review (Q2 2020) 2. Market Review 3. Portable Alpha Update	Dominic Garcia Chief Investment Officer Thomas Toth Wilshire
B	Information Item: Quarterly Staff Consultant Report: 1. Global Equity Asset Class Review 2. Private Equity Primer	LeAnne Larranaga Ruffy Co-Head Alpha Thomas Toth Wilshire Mike Krems Jeffrey Goldberger Aksia-Torrey Cove
C	Information Item: Private Asset Education 1. Intro: The Role of Private Investments 2. Process Enhancement: Method to Evaluate Value Add	Dominic Garcia Chief Investment Officer Thomas Toth Wilshire Joaquin Lujan Co-Head Alpha Avi Turetsky Barry Griffiths Landmark Partners LeAnne Larranaga-Ruffy Co-Head of Alpha

		Isaac Beckel Investment Associate
D	Information Item: Investment Division Updates 1. CIO Update 2. Manager Selection Activity Report 3. Cash Activity & Rebalance Update (Q2 2020) 4. Securities Lending Update (Q2 2020)	Dominic Garcia Chief Investment Officer LeAnne Larranaga-Ruffy Joaquin Lujan Co-Heads of Alpha Kristin Varela Deputy Chief Investment Officer

5. Adjournment

Consent Agenda

Approval of minutes of May 12, 2020 Investments Committee meeting.

Any person with a disability who is in need of a reader, amplifier, qualified sign language interpreter, or any other form of auxiliary aid or service to attend or participate in the hearing or meeting, please contact Trish Winter at (505) 476-9305 at least one week prior to the meeting, or as soon as possible. Public documents, including the agenda and minutes, can be provided in various accessible formats. Please contact Trish Winter if a summary or other type of accessible format is needed.

PERA
Public Employees
Retirement Association
of New Mexico

INVESTED IN TOMORROW.

John Melia
Chair, Municipal Member

Wayne Propst
Executive Director

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1(800) 342-3422

INVESTMENT COMMITTEE MEETING
August 25, 2020 at 1:00om MT

Please join the PERA August Investment Committee Zoom webinar.
When: Aug 25, 2020 01:00 PM Mountain Time (US and Canada)
Topic: August 25, 2020 Investment Committee Meeting

Please click the link below to join the webinar:
https://us02web.zoom.us/j/89031662429

Or iPhone one-tap :
US: +16699006833,,89031662429# or +12532158782,,89031662429#

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US: +1 669 900 6833 or +1 253 215 8782 or +1 346 248 7799 or +1 408 638 0968 or +1 312 626 6799 or +1 646 876 9923 or +1 301 715 8592

Webinar ID: 890 3166 2429
International numbers available: https://us02web.zoom.us/u/k53yXVz93

Please sign in 10 minutes before the meeting begins.

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https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee

4Q Fiscal Year 2020 Performance Update

August 25, 2020

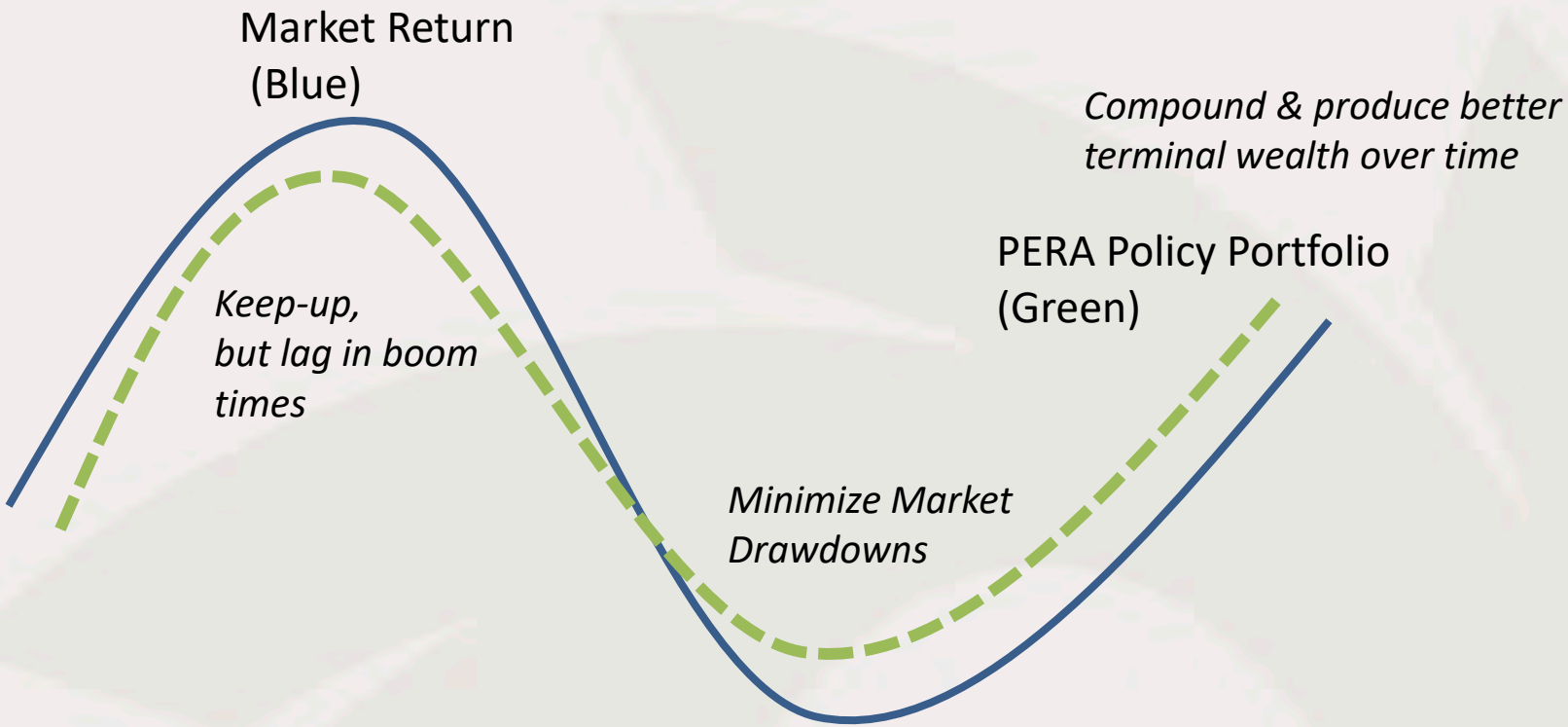
Dominic Garcia,
Chief Investment Officer

PERA Investment Goals Scorecard

PERA Investment Goals	Actual Results
Set Strategic Asset Allocation (Policy Portfolio) to meet the assumed return (7.25% currently and 7.7% ave. since inception) and funding goals over the long-term (10 years and longer).	✓ Exceeded actuarial hurdle rates for 10 years, 30 years, and since data inception (1985)
Produce returns to meet or exceed benchmarks Meet or exceed the Policy Portfolio over the long-term (10 years and longer) Meet or exceed the Reference Passive Portfolio over the long-term	✓ Met or Exceeded Policy Portfolio Benchmark over CYTD, 1 Year, 3 Year, 10 Year, 20 Year, 30 Year and Since Inception ✓ Exceeded Reference Passive Portfolio over long term
Achieve a total investment cost at or below a benchmark cost relative to peers adjusted for fund size and asset mix. As of 6/30/2020	✓ Compared to 334 Global funds in a custom benchmark cost, PERA is low cost and saves approximately $27m in fees and costs.

PERA

PERA Investment Strategy: Lower Risk & Diversified



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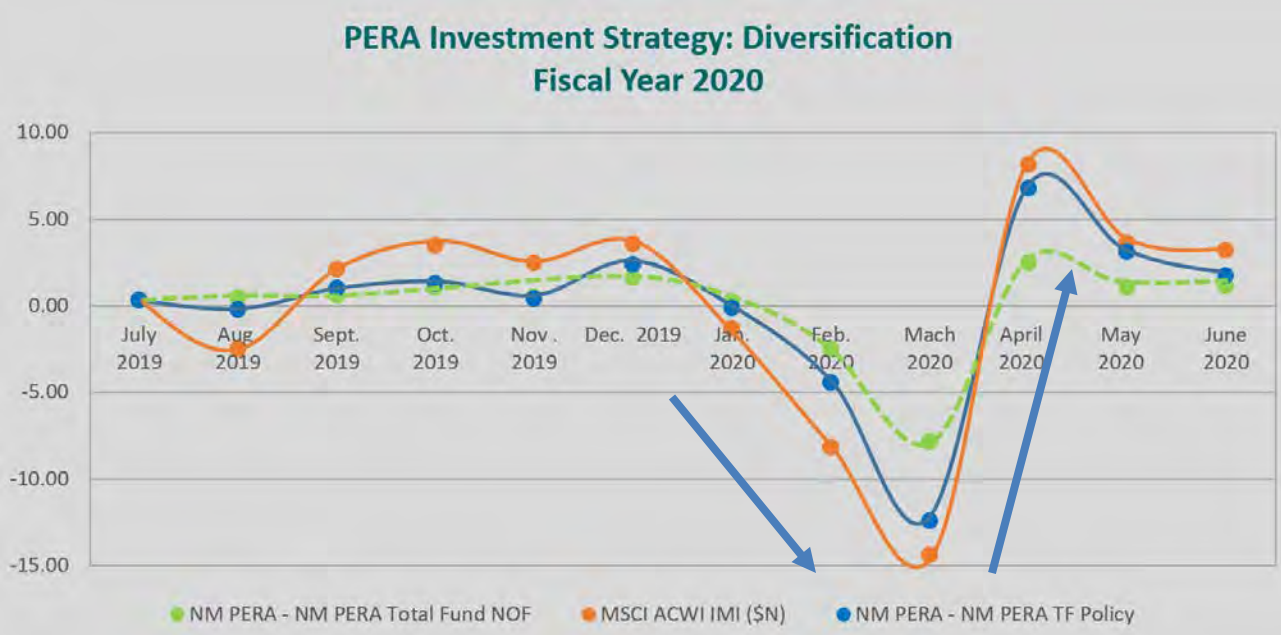
Tale of Two Investment Quarters

- PERA has a lower risk/conservative investment strategy that relies on diversification
- This strategy will perform better than the market in downturns and will lag in market booms
- During the onset of COVID, we experienced an entire market cycle in a short period of time
- Over almost all-time horizons, the Fund met or exceeded its Board adopted Policy Benchmark

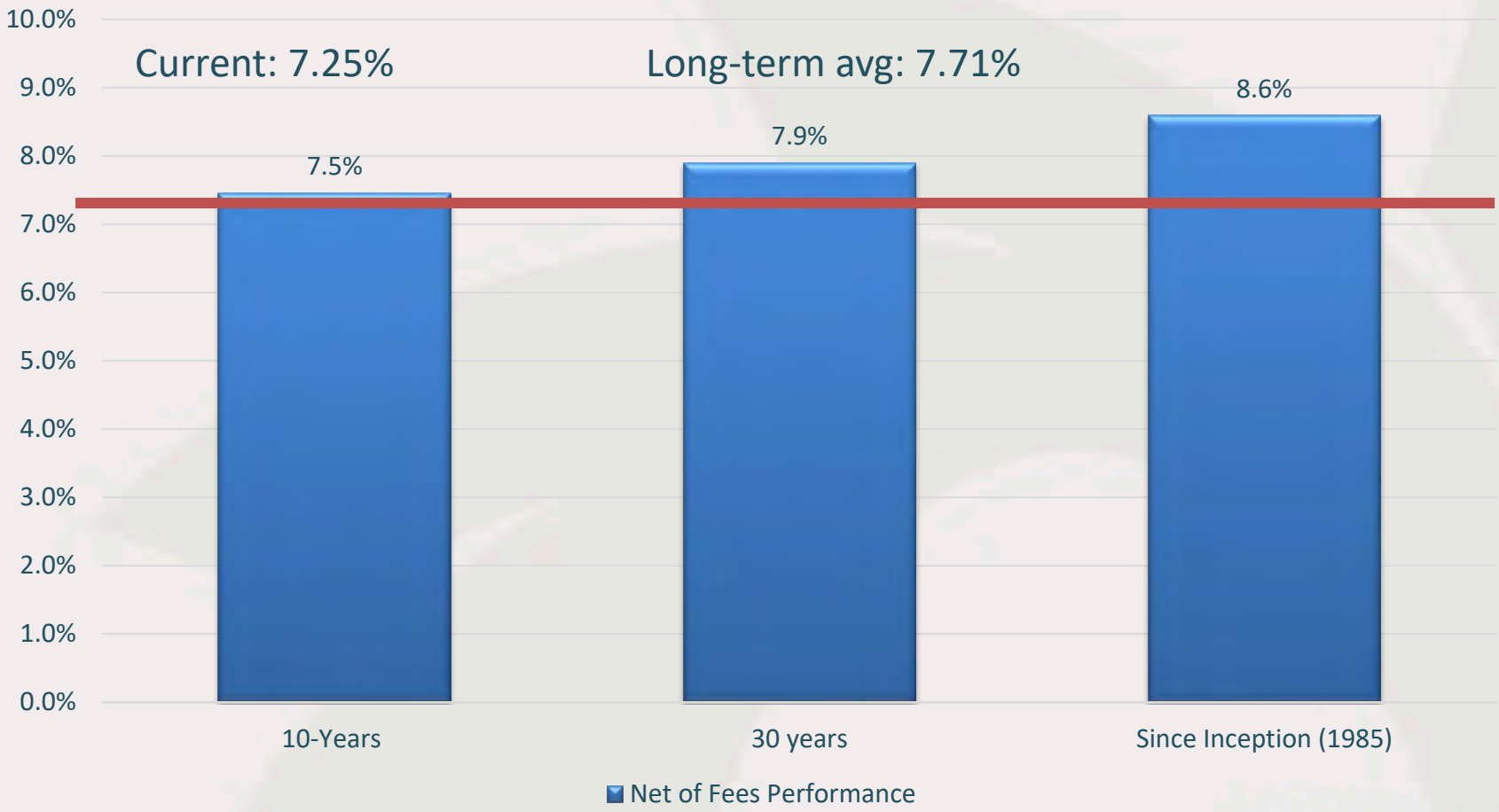


	CYTD	1-Year	3-Year	5-Year	10-Year	20-Year	30-Year	ITD
NM PERA Total Fund NOF	-5.8	-1.5	3.9	4.6	7.5	5.2	7.9	8.6
NM PERA Policy Benchmark	-6.4	-1.5	3.5	4.8	7.1	5.0	7.7	8.5

As of June 30, 2020

PERA

Scorecard: Long Term Actuarial Hurdles



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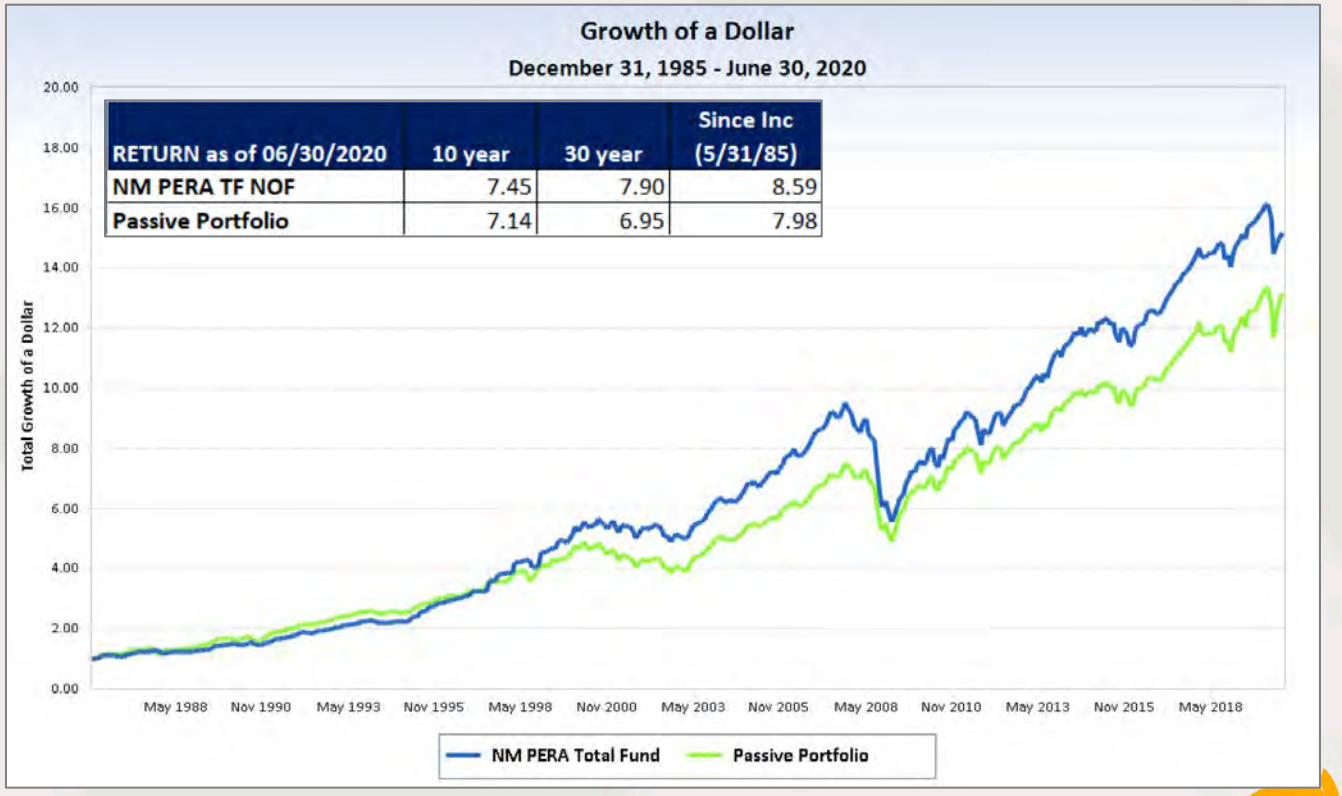
Scorecard: PERA vs. Reference Portfolio

- For the past 30 years, PERA has generated nearly 1% per annum over a passive portfolio at equivalent risk.
- The Passive Portfolio for the past 10 years is a 58% global stock/42% bond portfolio. Since Inception, the Passive Portfolio is roughly 62% stock/38% bond portfolio.



RETURN as of 06/30/2020	10 year	30 year	Since Inc (5/31/85)
NM PERA TF NOF	7.45	7.90	8.59
Passive Portfolio	7.14	6.95	7.98

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Scorecard: Cost Effective

- In a global database of 334 global funds, PERA produced $27 million in savings vs. custom benchmark cost

	*CEM Total Investment Cost Benchmark (2018)	*PERA Cost (Calendar Year 2018)	PERA Cost FY 2019
	85.5 bps	67.6 bps	47 bps
Lower cost implementation savings ($)	N/A	$18 million	N/A
Paying less than peers for external services ($)	N/A	$9 million	N/A
Total Cost Savings ($)	N/A	$27 million	N/A

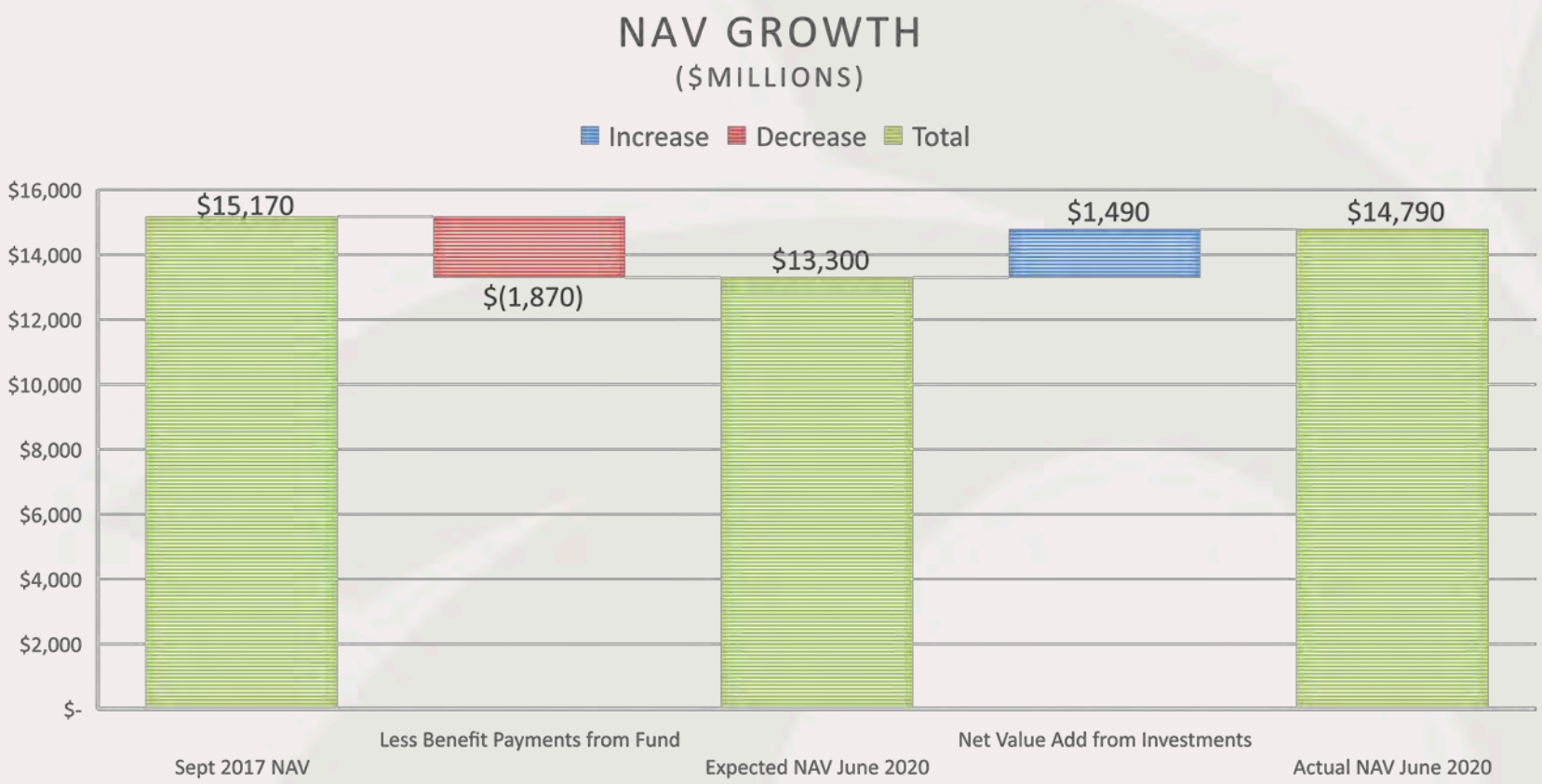
*Source: CEM Benchmarking

PERA

NAV & Benefit Payments

Sept. 2017 – June 30, 2020

Net Value Add from Investment Activities = $1,487,912,367



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Big Picture Going Forward

- **Potential Economic Regimes can vary widely with equal probability**
  - Good Times: High Growth, Low Inflation
  - So, So Times: Low Growth, Low Inflation
  - Inflationary: High Growth, High Inflation
  - Stagnation: Low Growth, High Inflation
  - Depression: No Growth or Negative Growth, deflation

- **Low Return Environment Persists**
  - Past 30 years Pre-COVID (as of Dec. 2019):
    - Cash Return = ~3% returns
    - 60/40 portfolio (over cash)= ~5.6%
    - Total Return= ~8.6%
  - Cash is now ZERO, and will be Lower for Longer; Need to make up 2%-3%.

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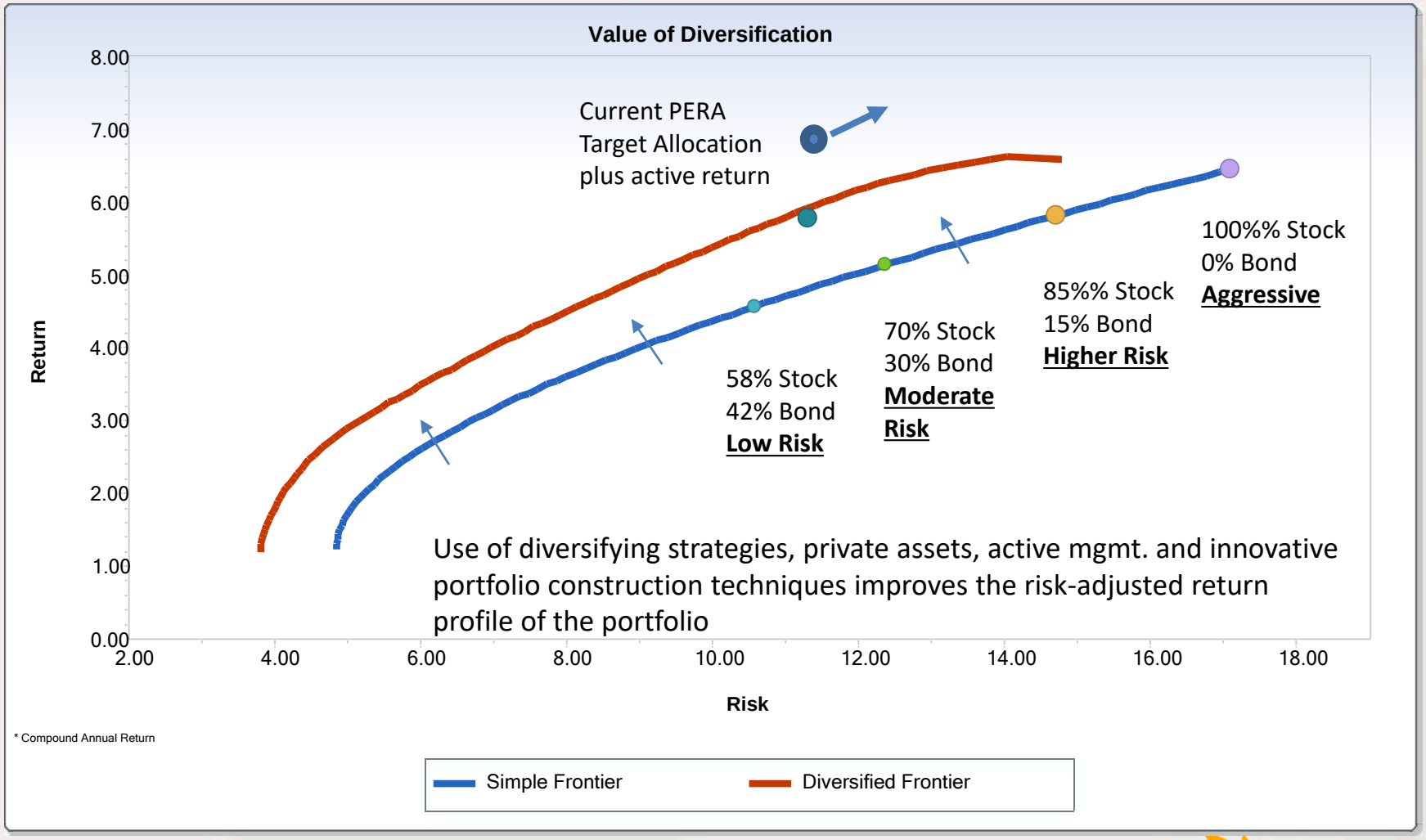
10-Year Forward Expected Returns



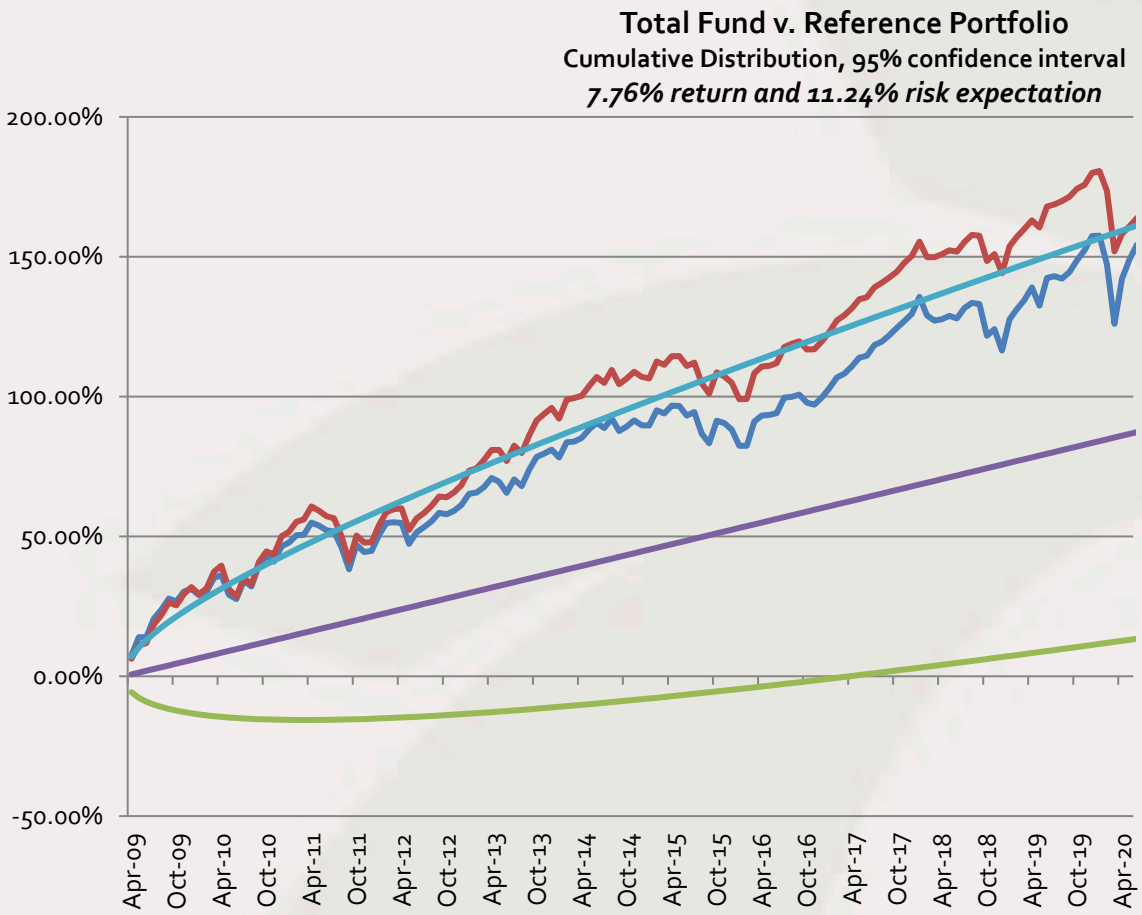
PERA

Performance and Risk Update: Q4 FY20

August 2020

Thomas Toth, Managing Director – Wilshire Associates

Total Fund versus Reference Portfolio – 10 Years



Expectations based on PERA target asset allocation and Wilshire asset class assumptions as of 2009

- Cumulative Reference Portfolio Return
- Cumulative NOF Total Fund Return
- Lower Band
- Target
- Upper Band

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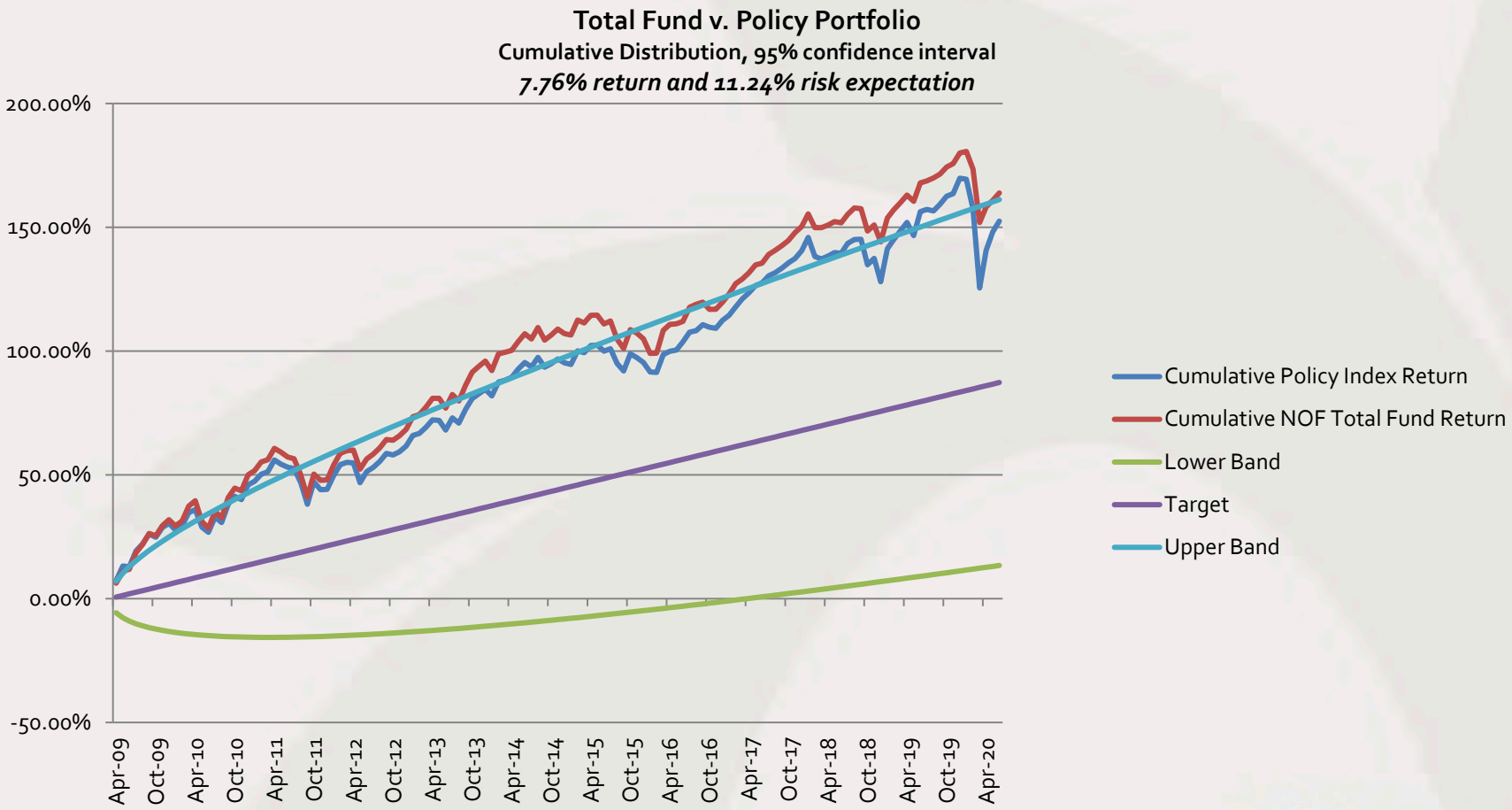
Total Fund versus Policy Index – 10 Years



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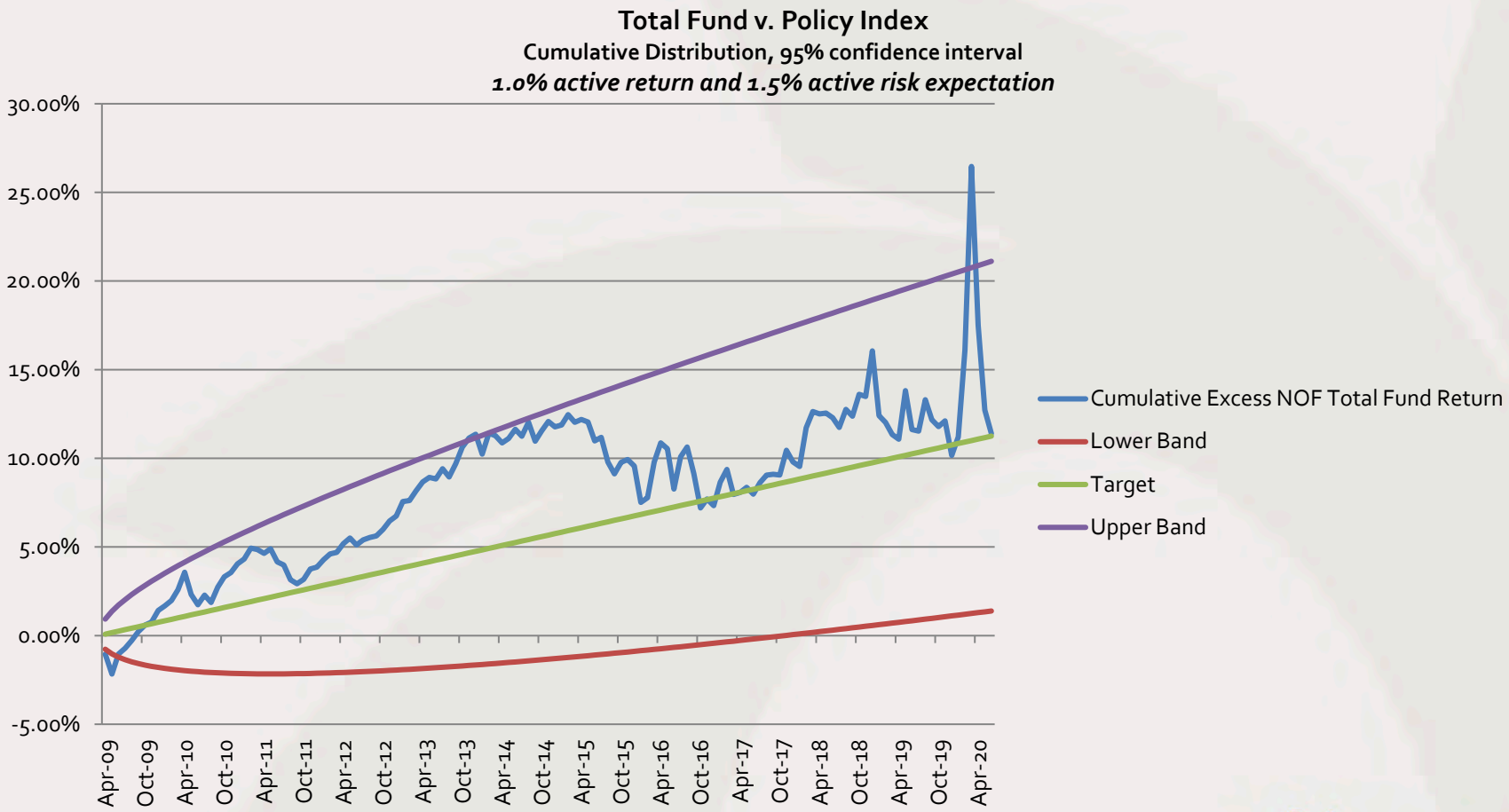
Total Fund Active versus Policy Index – 10 Years



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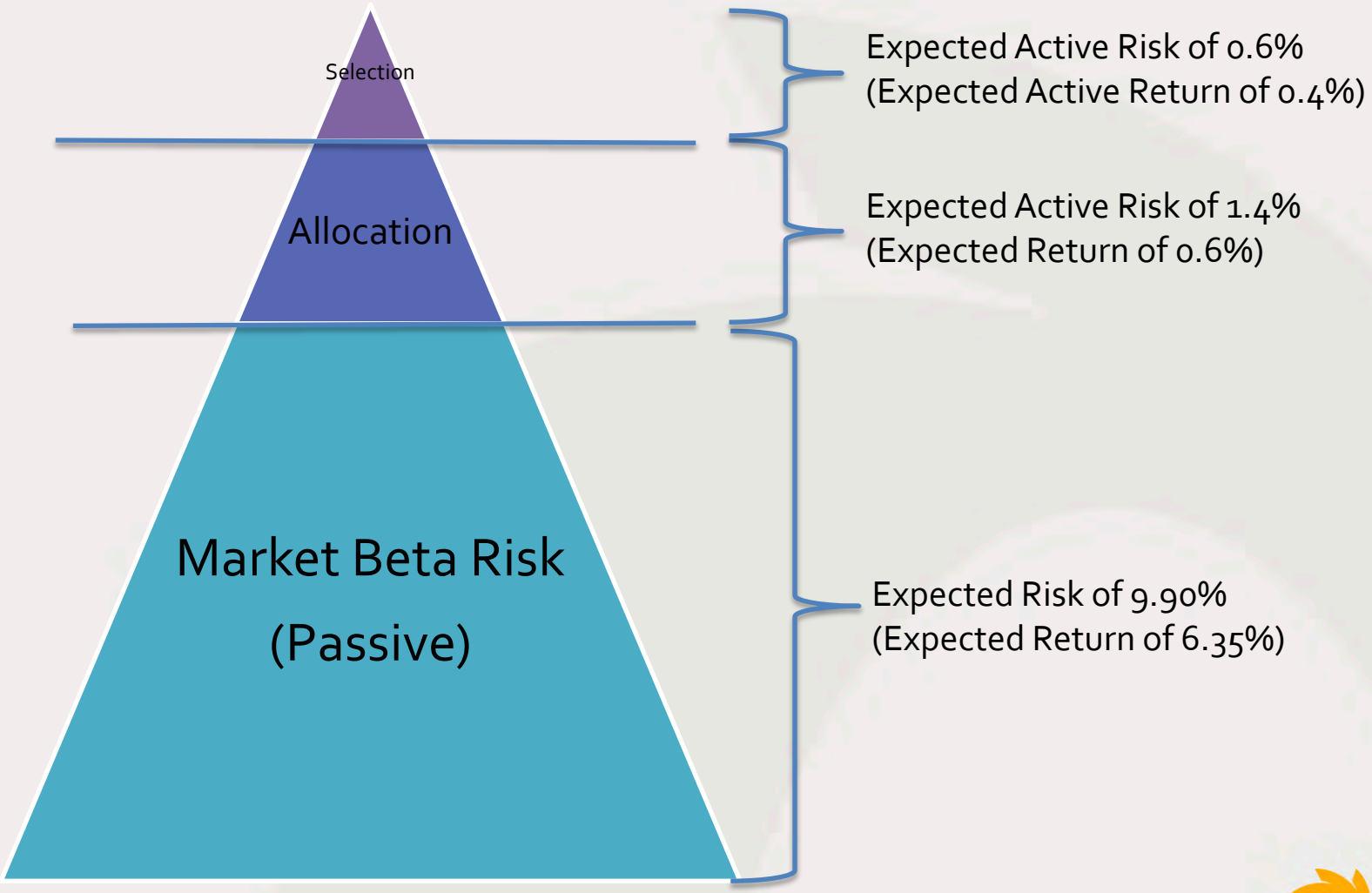
2019 Total Fund Risk Budget

Target Return= 7.35%
Target Risk = 10.2%



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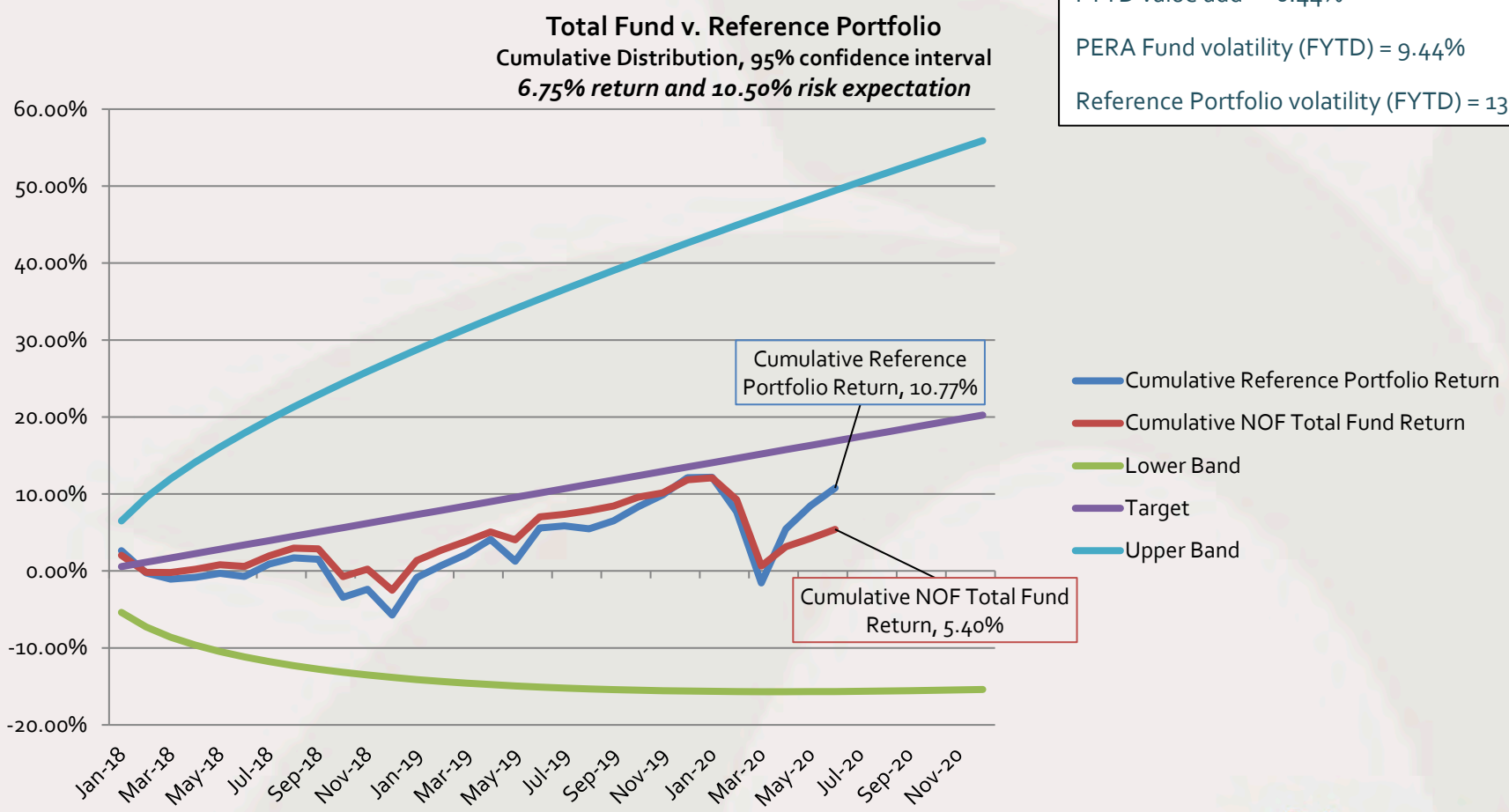
Total Fund versus Reference Portfolio

FYTD value add = -6.44%

PERA Fund volatility (FYTD) = 9.44%

Reference Portfolio volatility (FYTD) = 13.25%

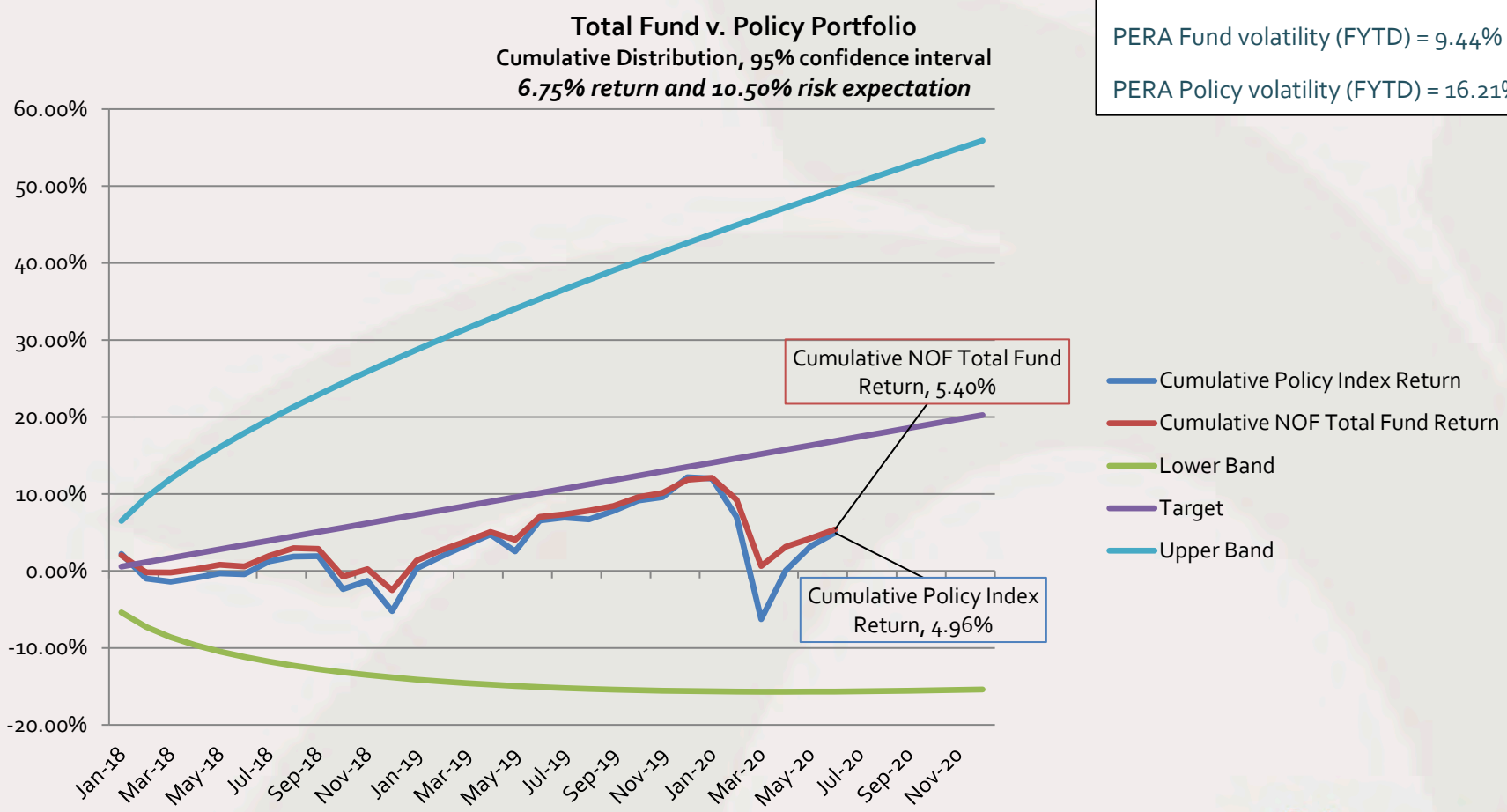


Total Fund versus Policy Portfolio

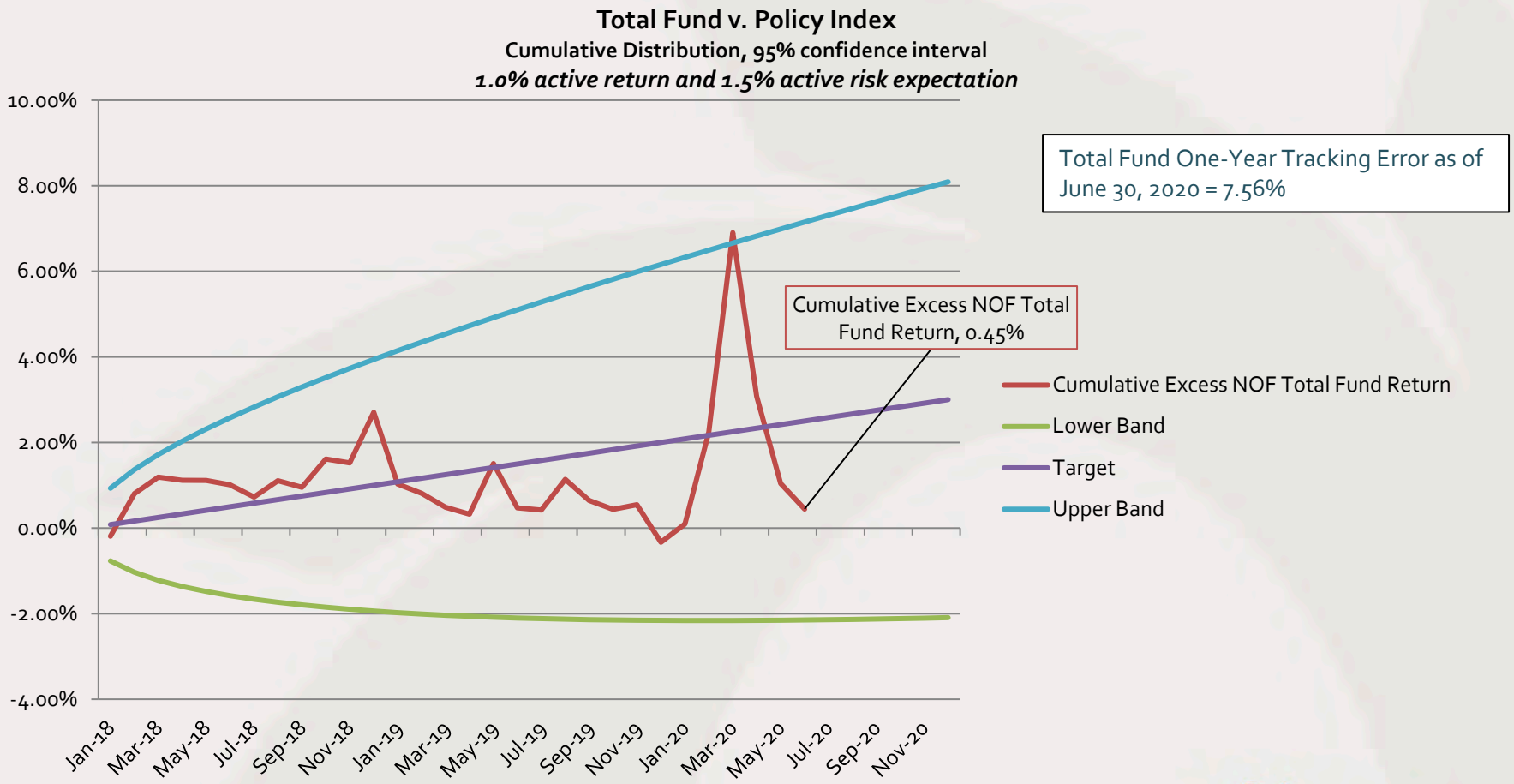
FYTD value add = -0.02%

PERA Fund volatility (FYTD) = 9.44%

PERA Policy volatility (FYTD) = 16.21%



Active Risk versus Expectations – Cumulative Months



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Performance Detail – Asset Class

As of 6/30/20	Market Value	% Market Value	% Target	Total Fund Performance	Q4 FY20	FYTD	1-yr	3-yr	5-yr	10-yr
TOTAL FUND	$14.8b	100.0%		NOF Return	4.74%	-1.52%	-1.52%	3.85	4.57%	7.49%
				Value Add v. Policy	*-7.24%*	*-0.02%*	*-0.02%*	*0.33%*	*-0.20%*	*0.17%*
Global Equity	$5.5b	35.8%	35.5%	NOF Return	11.49%	0.71%	0.71%	6.13%	6.82%	
				Value Add v. Policy	*-6.67%*	*0.09%*	*0.09%*	*0.35%*	*0.11%*	
Risk Reduction	$2.9b	19.4%	19.5%	NOF Return	2.00%	6.32%	6.32%	4.66%	4.13%	
				Value Add v. Policy	*-0.84%*	*-2.11%*	*-2.11%*	*-0.65%*	*-0.17%*	
Credit	$2.1b	14.2%	15.0%	NOF Return	-3.60%	-4.73%	-4.73%	1.45%	2.78%	
				Value Add v. Policy	*-15.28%*	*-3.43%*	*-3.43%*	*-1.31%*	*-1.68%*	
Real Assets	$3.0b	20.0%	20.0%	NOF Return	0.32%	-7.58%	-7.58%	0.74%	1.55%	
				Value Add v. Policy	*-12.08%*	*4.74%*	*4.74%*	*2.75%*	*0.96%*	
Risk Parity	$1.4b	9.2%	10.0%	NOF Return	8.08%	-8.95%	-8.95%			
				Value Add v. Policy	*0.08%*	*-0.73%*	*-0.73%*			

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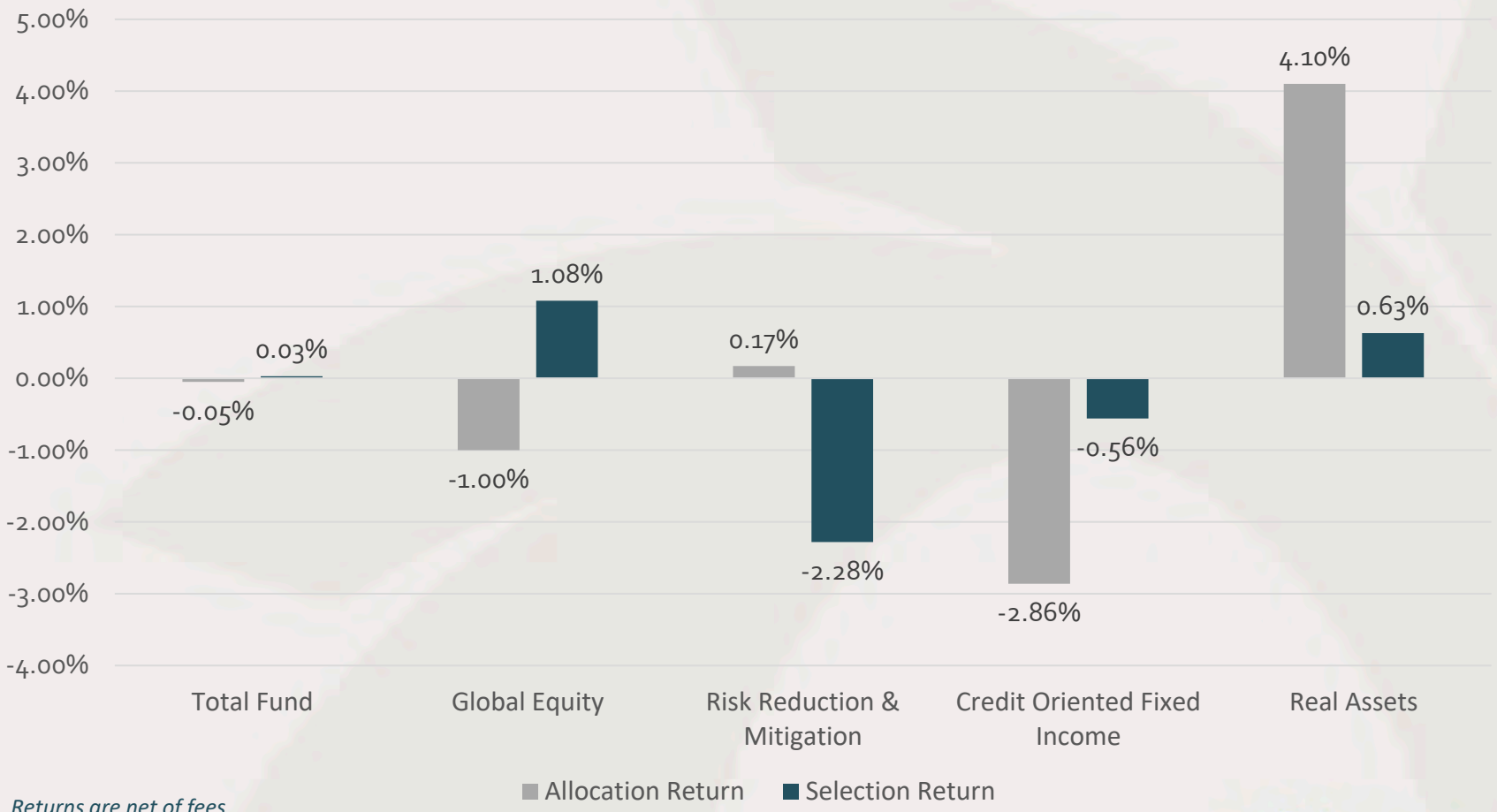
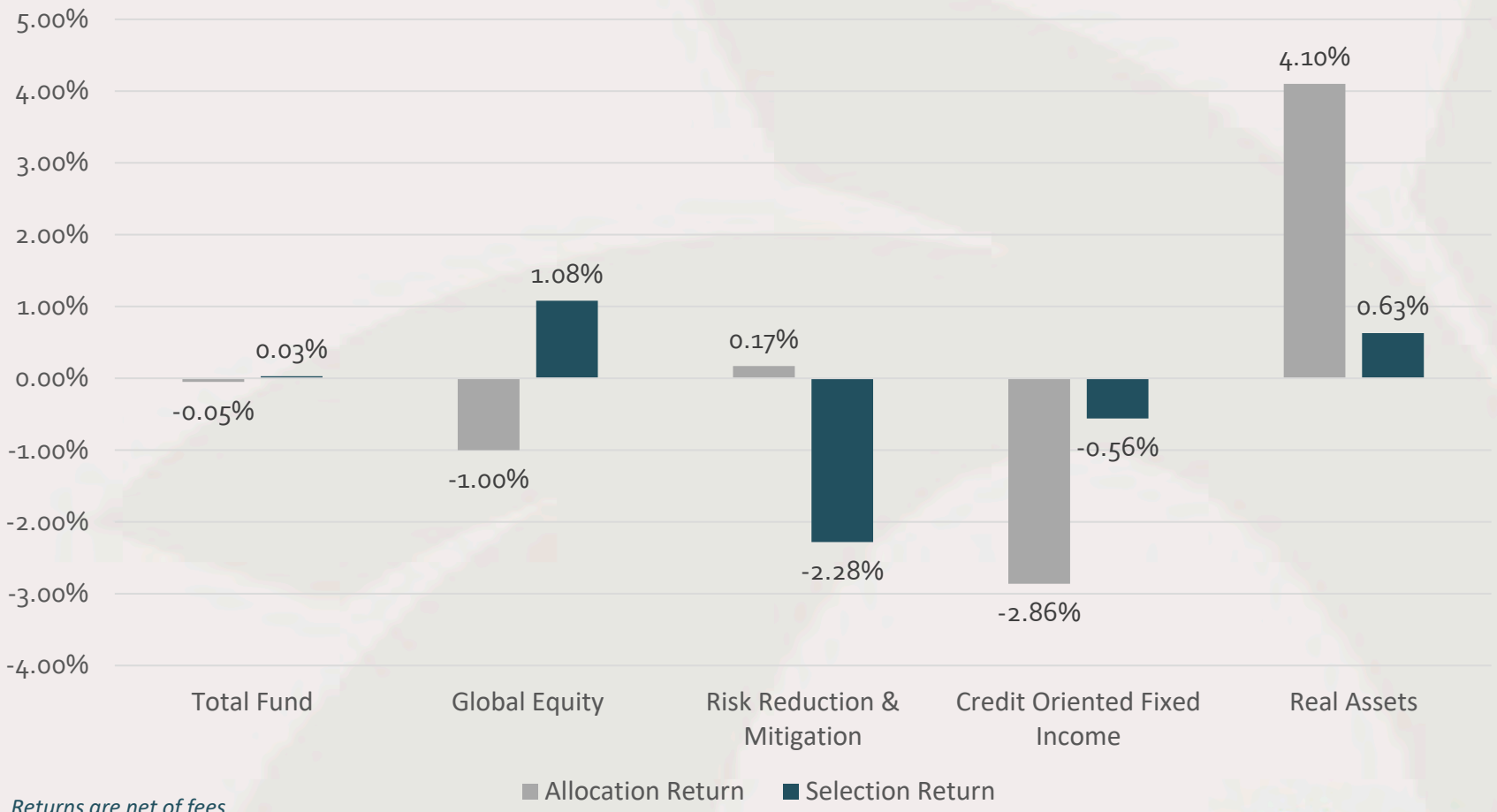
FYTD Performance Attribution: Active Risk Budget Framework



Returns are net of fees

PERA

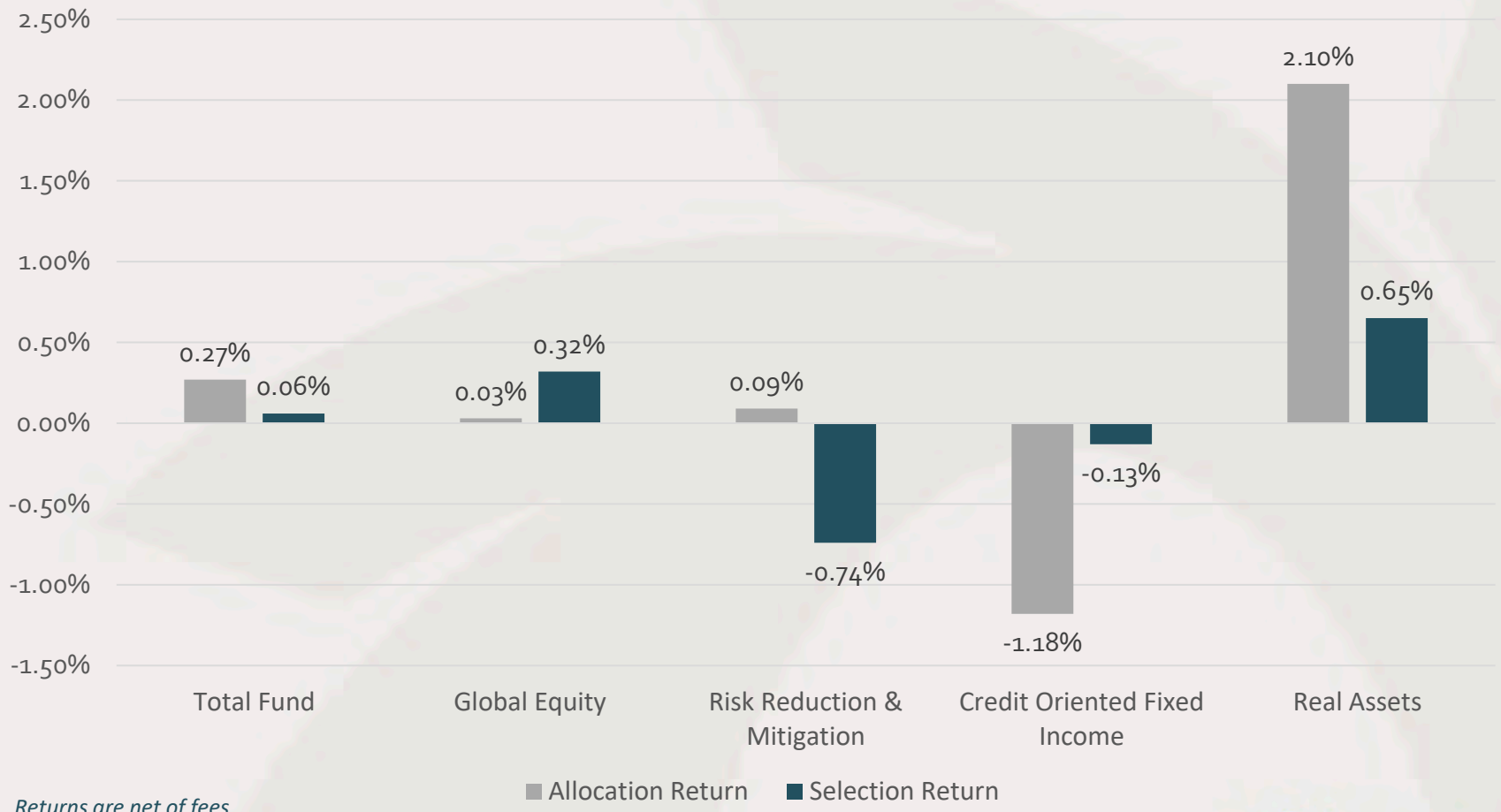
1-year Performance Attribution: Active Risk Budget Framework



Returns are net of fees

PERA

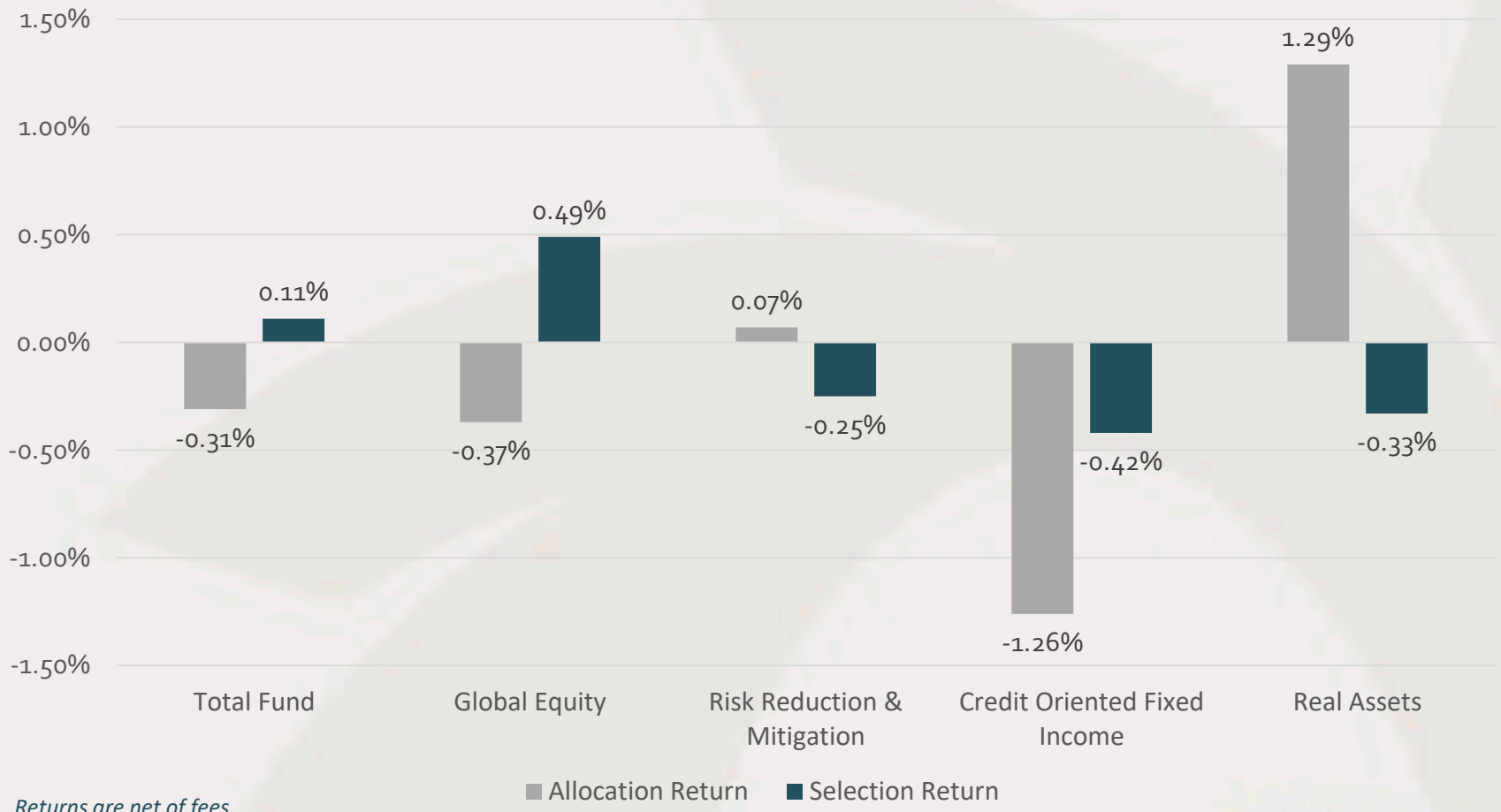
3-year Performance Attribution: Active Risk Budget Framework



Returns are net of fees

PERA

5-year Performance Attribution: Active Risk Budget Framework



Returns are net of fees

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Historical Risk Measurements (1-Year)

As of June 2020	Capital Allocation	Volatility (σ)	Sharpe Ratio	Tracking Error	Beta
Total Fund	100%	9.44%	-0.33	7.56%	0.57
Policy Benchmark		16.21%	-0.19		
Global Equity	37.3%	15.30%	-0.06	6.45%	0.72
Risk Reduction	19.4%	4.17%	1.11	2.11%	0.99
Credit	14.2%	7.62%	-0.82	15.99%	0.16
Real Assets	20.0%	8.79%	-1.03	16.29%	0.36
Risk Parity	9.2%	22.30%	-0.47	0.60%	1.00

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Summary

- Long term 10-year performance on both an absolute and relative basis remains strong for the PERA Total Fund
- The PERA fund underperformed the policy benchmark by 724 bps for Q4 FY20, and slightly trailed the policy benchmark by 2 bps for the 1-year period, net of fees
- The PERA fund underperformed the passive reference portfolio by 780 bps for Q4 FY20, and lagged by 644 bps for the 1-year period, net of fees
- As of June 30th, the fund is within an acceptable range of the target weights for all asset classes

PERA

Appendix (Formulas)

- **Selection return =** *(portfolio return – dynamically weighted selection benchmark return)*

- **Allocation return=** *(dynamically weighted selection benchmark return – policy benchmark return)*

- **Historical Alpha** = (R– Beta*P) *√12

  Where:

  Beta is portfolio beta;

  R - mean of the portfolio real returns (portfolio return- 91 day Tbill return) ;

  P - mean of the policy real returns (policy return – 91 day Tbill return)

PERA

WILSHIRE ASSOCIATES

Wilshire Consulting

Quarterly Market Review

Thomas Toth, CFA
Managing Director

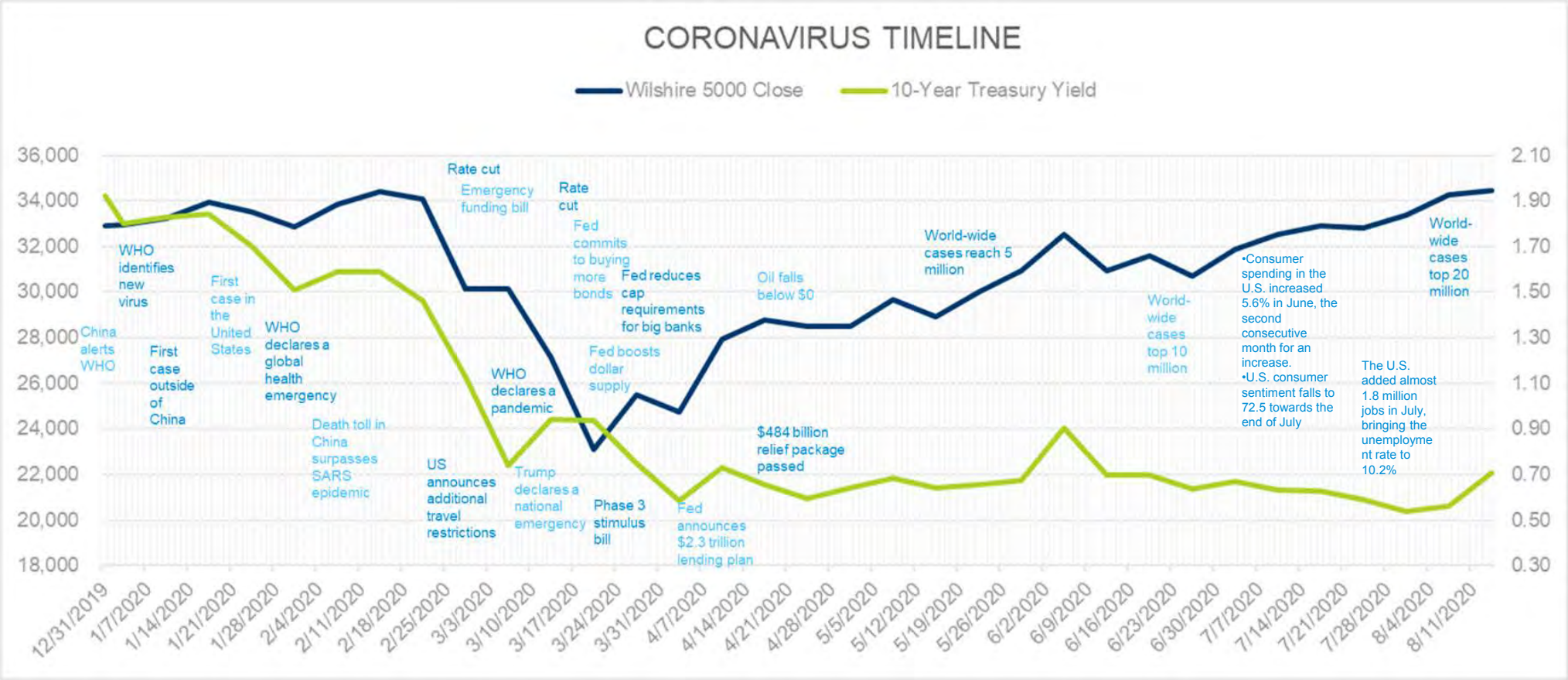
August 2020

Wilshire Consulting

CORONAVIRUS TIMELINE

AS OF AUGUST 14

https://wilshire.com/covid19-timeline



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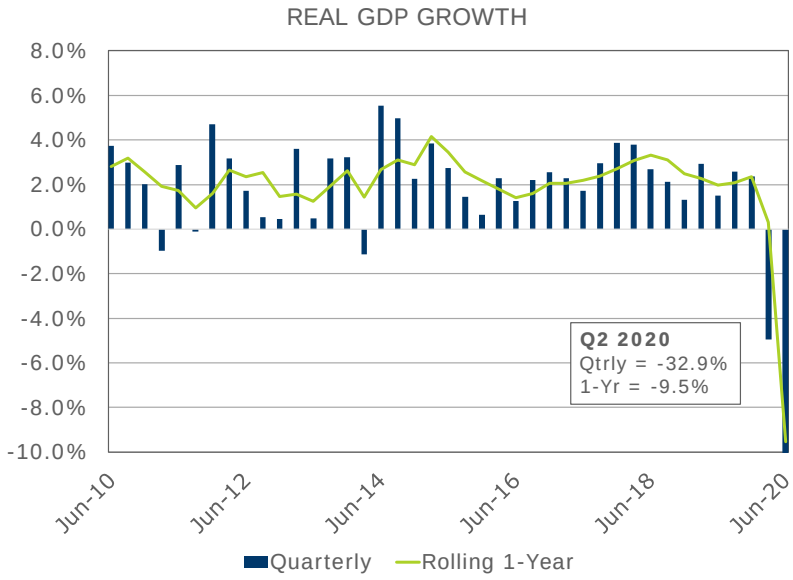
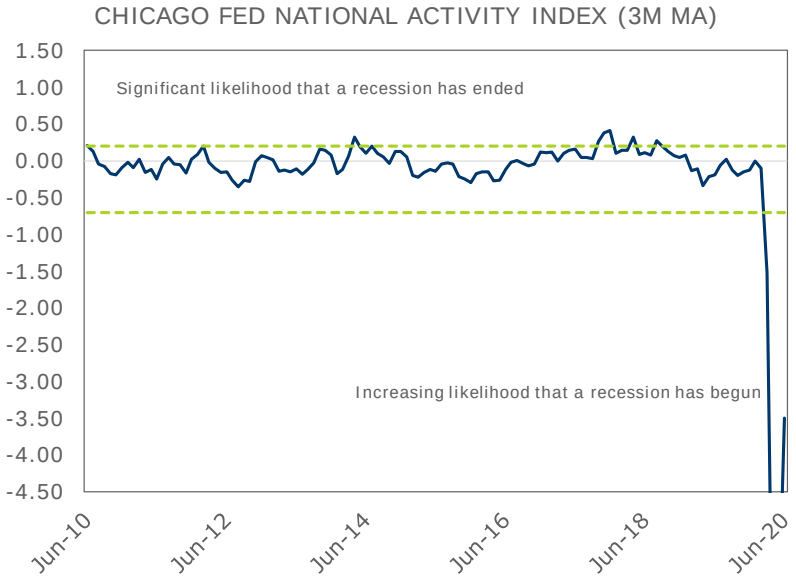
ECONOMIC GROWTH





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Data source: Bloomberg

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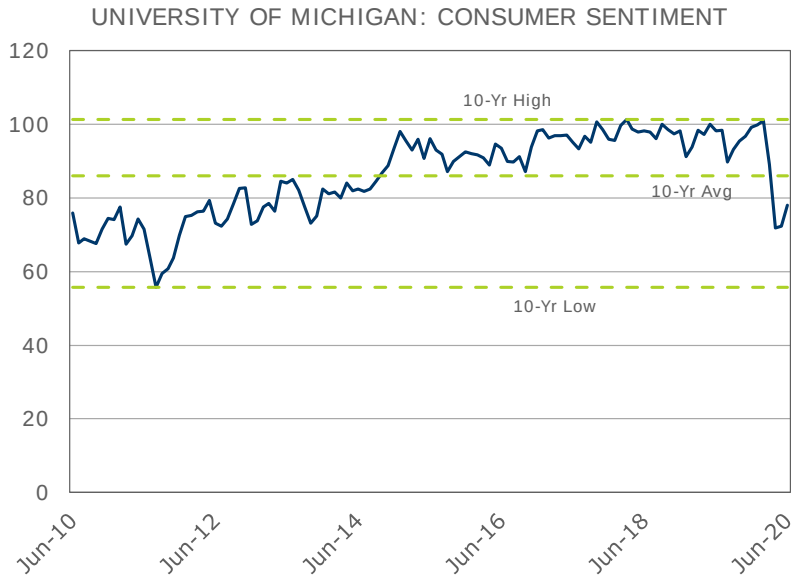
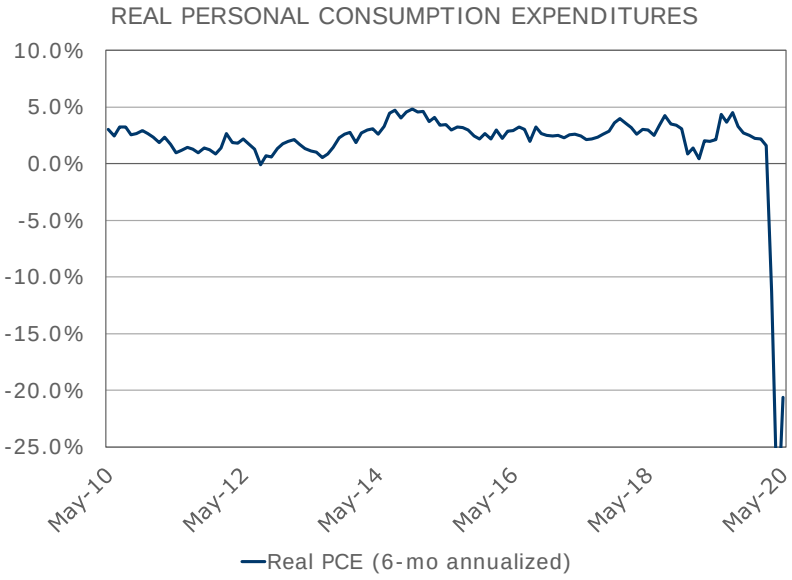
CONSUMER ACTIVITY





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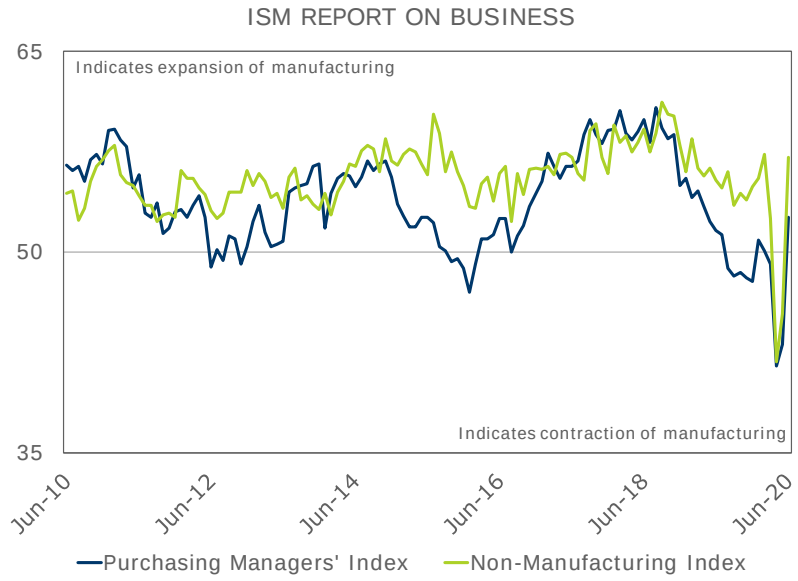
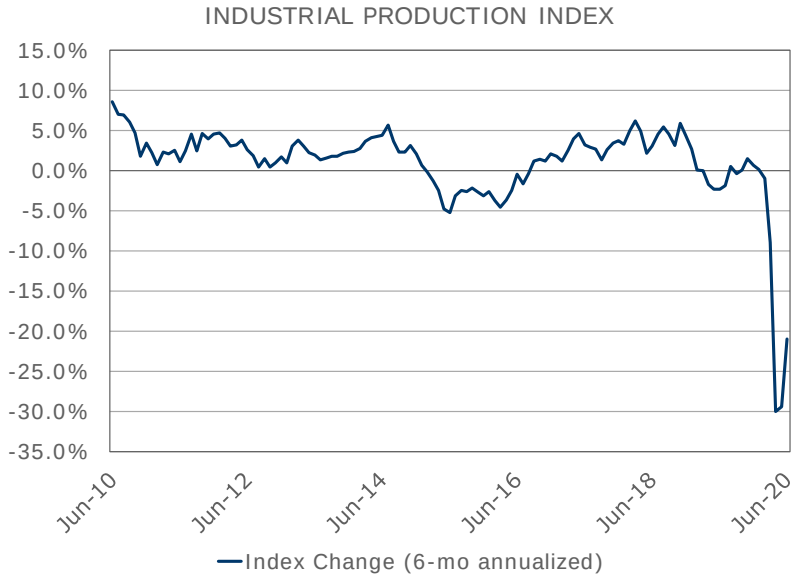
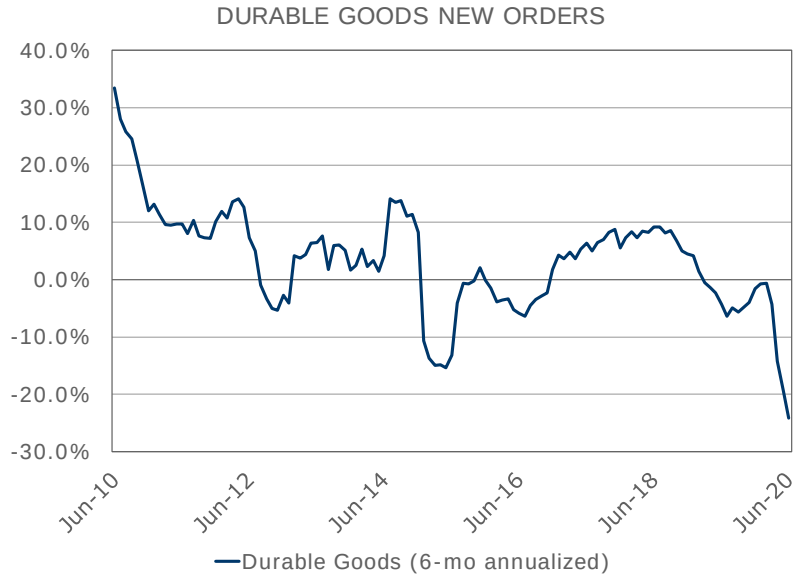
BUSINESS ACTIVITY







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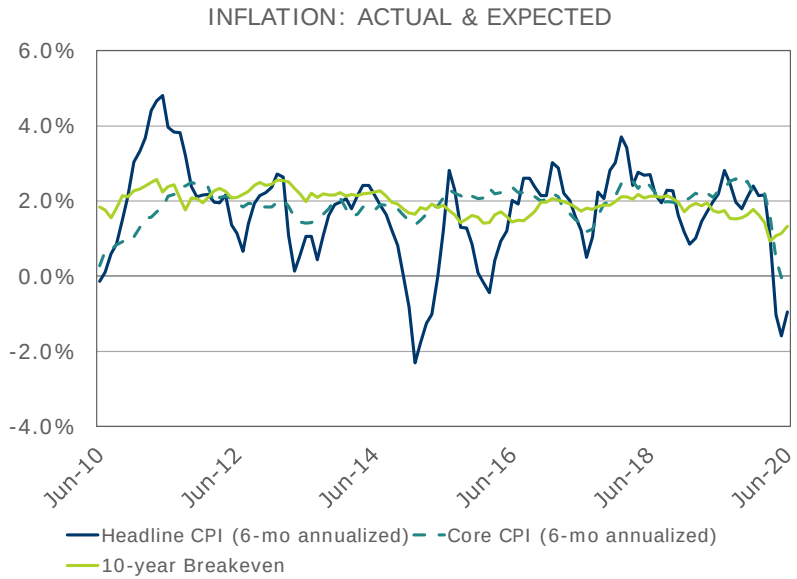
INFLATION AND EMPLOYMENT



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Data source: Bloomberg

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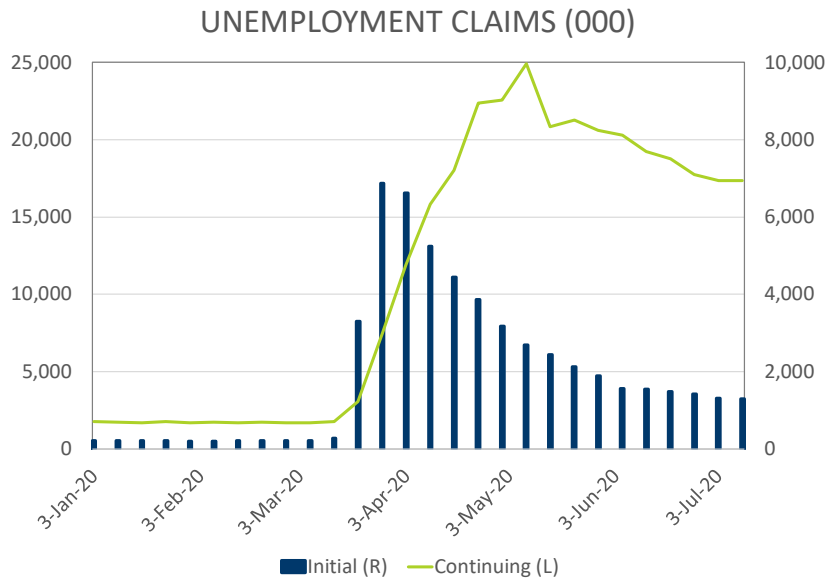
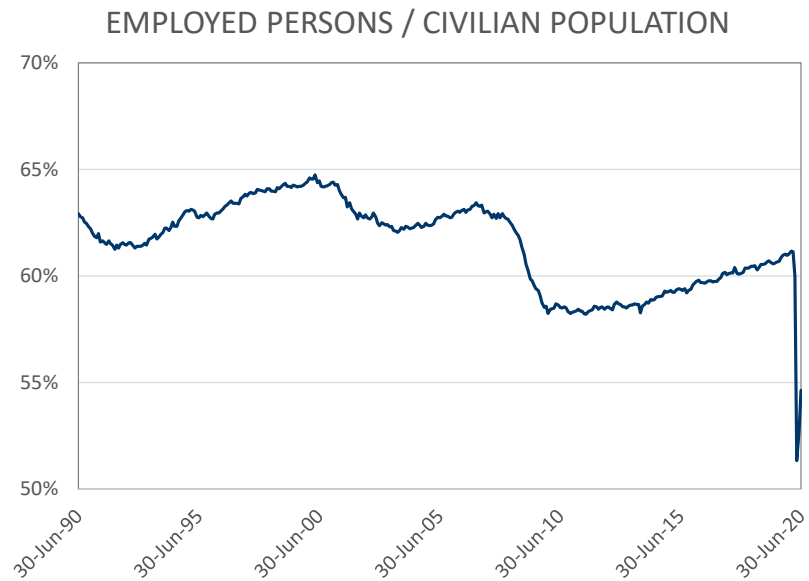
U.S. EMPLOYMENT

- Employment conditions have been volatile this year with massive gains and losses, as seen on the previous page
- Unemployment claims have been declining with continued claims currently at 17 million



- Employment as a percent of the civilian, non-institutional population dropped to nearly 50%
- The ratio has never been that low in the post-WWII history



Data sources: Federal Reserve, Bloomberg

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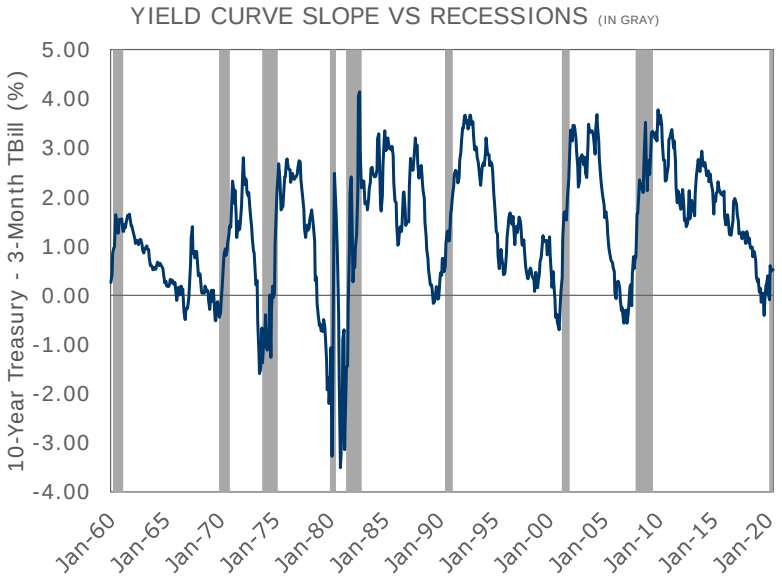
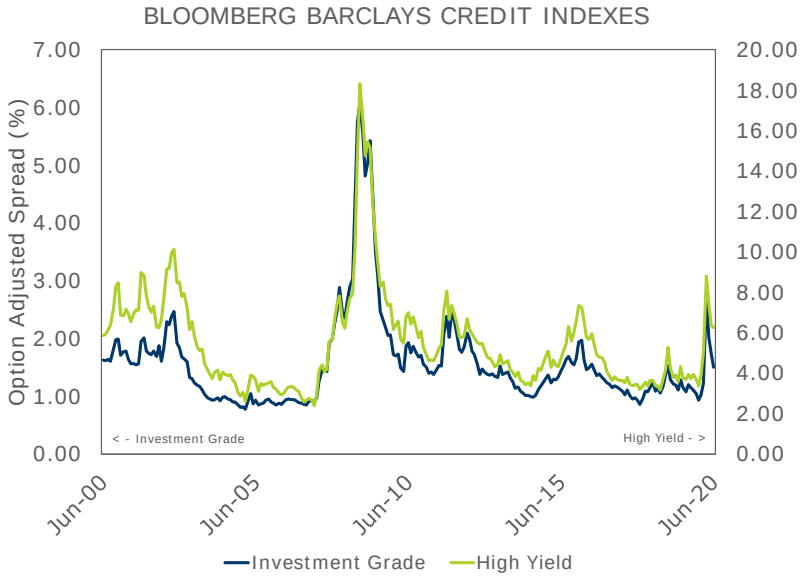
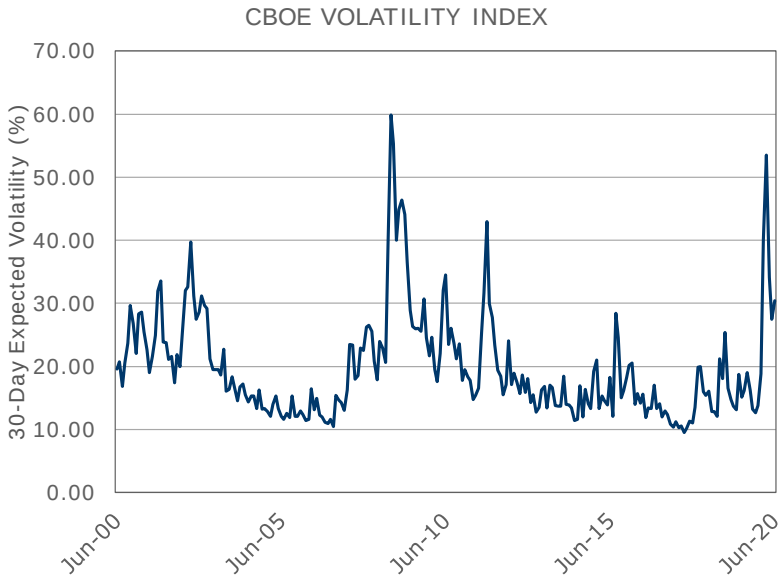
RISK MONITOR







Data sources: Bloomberg

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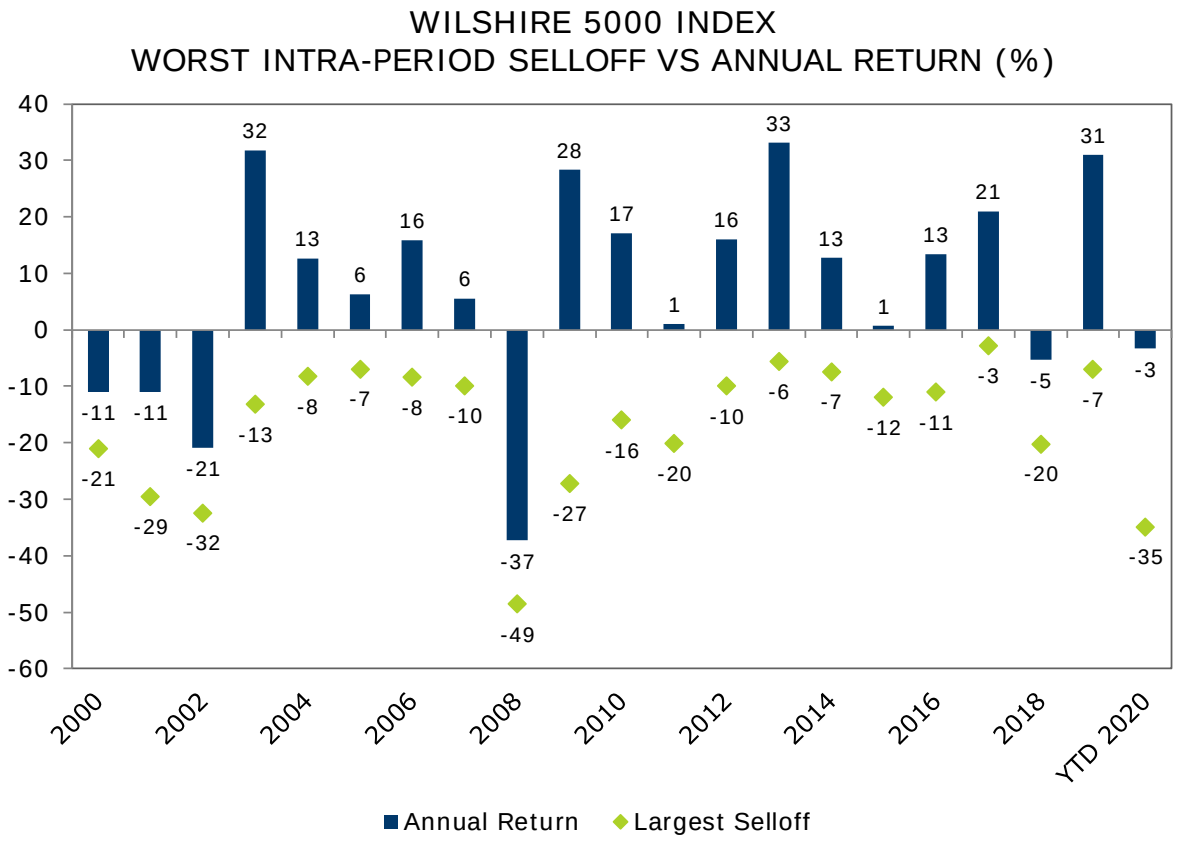
ANNUAL RETURNS

- Coronavirus sell-off began in late February and reached -35% in late March, which was the fastest bear market decline in history
- Q2 return of 21.9% was the strongest quarterly return in 21 years, and the fastest bull market resumption in history



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Data sources: Wilshire Associates

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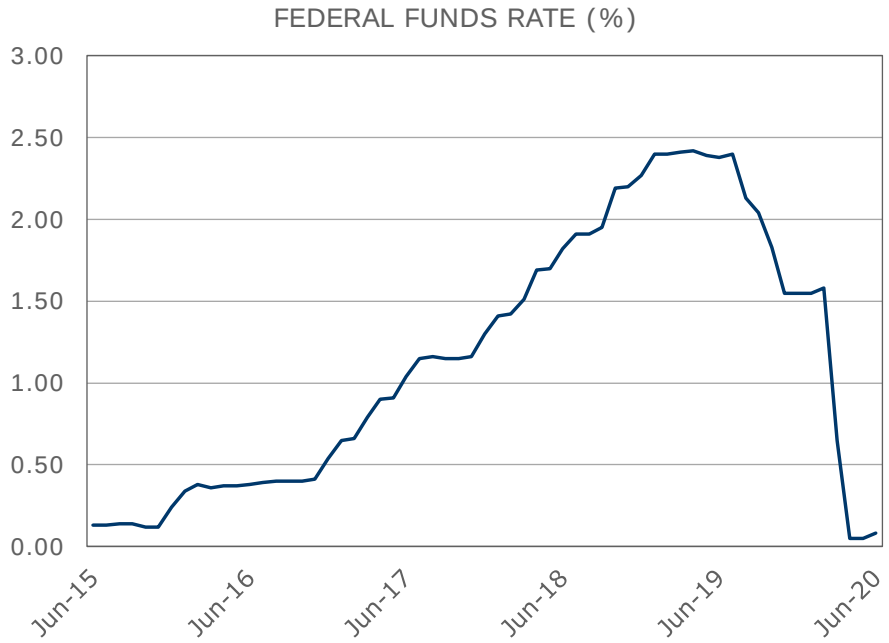
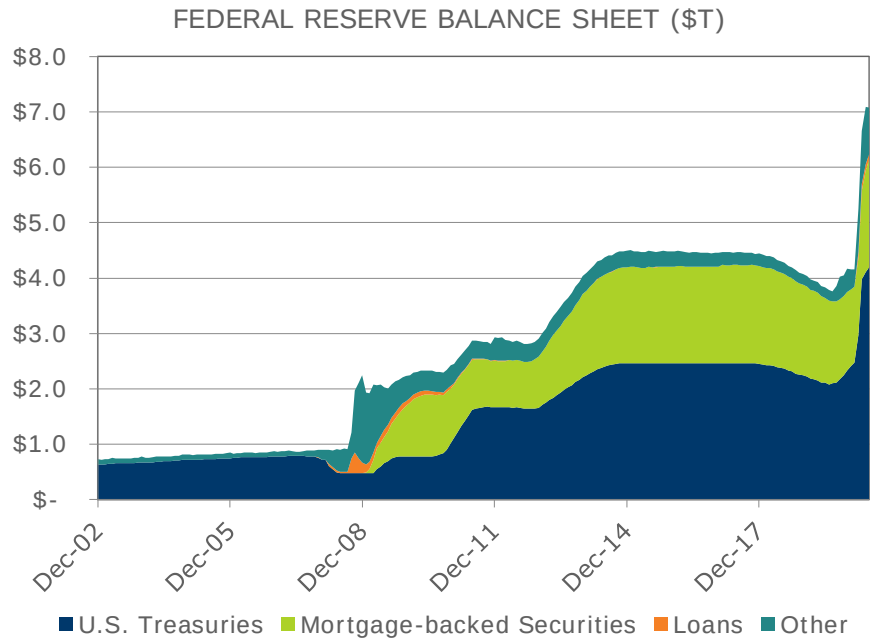
FEDERAL RESERVE

- Current expectation for the Fed-funds rate is to remain near zero through 2022
- Federal Reserve has added nearly $3 trillion in assets to their balance sheet just this year
- Unlike after the GFC, the Fed is also buying corporate and municipal bonds in addition to Treasuries and MBS

	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	$1,403
QE2	11/3/2010	6/29/2012	$568
QE3	9/13/2012	10/29/2014	$1,674
QE4	3/23/2020		$2,924





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Data Source: Bloomberg, JP Morgan

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JUNE 2020 ASSET CLASS ASSUMPTIONS

	EQUITY						FIXED INCOME						REAL ASSETS					
													Real Estate					
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Dev ex-US Bond (Hdg)	US RES	Global RES	Private RE	Cmdty	Real Assets	US CPI
COMPOUND RETURN (%)	6.00	6.50	6.50	6.75	6.45	8.15	0.75	1.25	2.10	0.30	4.00	0.40	5.10	5.30	6.80	2.25	5.45	1.50
ARITHMETIC RETURN (%)	7.30	7.95	9.45	8.35	7.80	11.50	0.75	1.40	2.55	0.50	4.50	0.45	6.45	6.45	7.70	3.30	5.80	1.50
EXPECTED RISK (%)	17.00	18.00	26.00	18.95	17.10	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75
CASH YIELD (%)	2.00	3.00	2.50	2.85	2.40	0.00	0.75	1.85	2.65	1.15	7.00	1.10	4.00	4.00	2.60	0.75	2.25	0.00
GROWTH EXPOSURE	8.00	9.00	7.50	8.60	8.25	14.00	0.00	-0.90	-2.30	-3.00	4.00	-1.00	8.00	8.00	5.50	0.00	1.90	0.00
INFLATION EXPOSURE	0.00	3.00	12.00	5.45	2.40	1.00	0.00	-2.50	-6.70	2.50	1.00	-3.00	0.00	1.35	0.00	12.00	4.40	1.00
CORRELATIONS																		
US Stock	1.00																	
Dev ex-US Stock (USD)	0.81	1.00																
Emerging Mkt Stock	0.74	0.74	1.00															
Global ex-US Stock	0.83	0.96	0.87	1.00														
Global Stock	0.95	0.92	0.83	0.94	1.00													
Private Equity	0.74	0.64	0.62	0.67	0.74	1.00												
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
Core Bond	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00										
LT Core Bond	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.93	1.00									
TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.60	0.47	1.00								
High Yield Bond	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.66	0.39	0.26	1.00						
US RE Securities	0.59	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00					
Global RE Securities	0.65	0.59	0.56	0.62	0.66	0.58	-0.05	0.17	0.22	0.11	0.62	0.03	0.94	1.00				
Private Real Estate	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.78	0.76	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.42	0.43	0.50	0.48	0.47	0.43	0.01	0.24	0.25	0.41	0.53	0.06	0.65	0.69	0.69	0.59	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	-0.08	0.05	0.03	0.05	0.44	0.26	1.00

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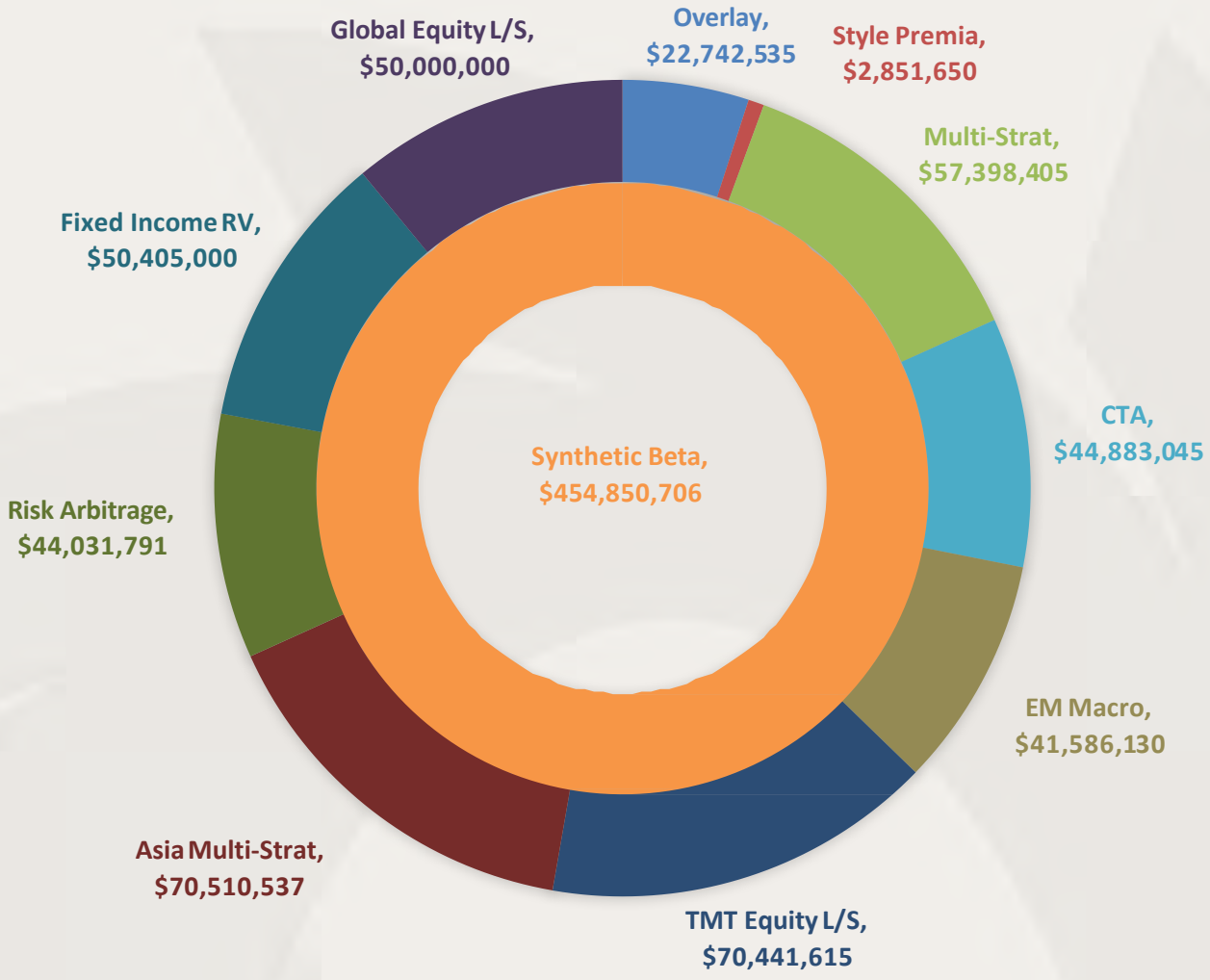
PERA

Portable Alpha Update

August 25, 2020

Bonds+ Alpha Engine
August 1 NAV Snapshot

Alpha Engine
= $432 mm,
8 Strategies



**Multi-Strat commitment has 3-yr, $75.5 millionof undrawn capital*
***Style Premia strategy liquidated with 5% holdback available April 2021*

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Bonds+ Alpha Engine
August 1 Initiatives Completed

- $50 million to Equity Long/Short
- Exchange $116 million Structured Credit manager with Credit Portfolio
- $66 million remaining to size up positions and/or add one additional best-in-class manager

Performance Summary*	1mo.	3mo.	YTD
Alpha Engine	1.50%	4.75%	-6.78%
Beta (US AGG)	1.49%	2.61%	7.72%
Bond + Composite (combined)	2.80%	6.94%	0.59%
HFRI Market Neutral	0.28%	0.63%	-1.83%

**Non-lagged estimates, as of July 31, 2020*

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Bonds+ Alpha Engine Proforma
Risk Summary

Portfolio Statistics

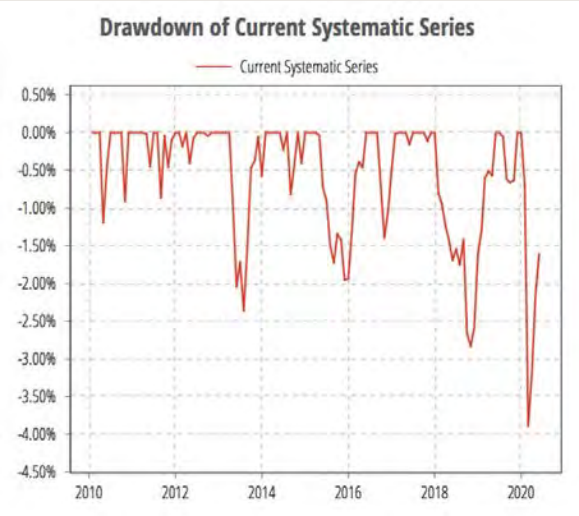
Portfolio Details	
Month	Jun 2020
Reporting Currency	USD
Tactical Benchmark	DJ CS Equity MN
Portfolio Dates	
Proforma Start	Jan 2002
Historical Systematic Start	Jan 2002
Current Systematic Start	Mar 2010
Based on Portfolio (Comp)[1]	
Jun 2020	1.52%
QTD Return	5.18%
YTD Return	4.58%
Annualized Return	9.73%
Annualized Volatility	3.57%
Downside Volatility[2]	1.75%
Sharpe Ratio[2]	2.34
Sortino Ratio[2]	4.78
Maximum Drawdown	-9.06%
Tactical Benchmark Return	0.52%
Tactical Benchmark Outperf.	9.21%
Historical Systematic Return	3.09%
Historical Systematic Outperf.	6.63%
Beta vs MSCI ACWI IMI TR Net[3]	0.13
Beta vs Index 2[4]	0.09
Correlation to Historical Systematic	0.63
Based on Current Systematic	
Annualized Expected Volatility	2.96%
1 Month 95% VaR	1.41%
Beta vs MSCI ACWI IMI TR Net[5]	0.11
Beta vs Index 2[6]	0.32
Beta vs DJ CS Equity MN[5]	0.21

[1]Unless otherwise noted, Jan 2002-Jun 2020 [2]Risk-Free=1.39% [3]Jan 2002-Jun 2020. [4]Barclays US Agg. TR UH. Jan 2002-Jun 2020. [5]Mar 2010-Jun 2020. [6]Barclays US Agg. TR UH. Mar 2010-Jun 2020.

Risk Summary

	Total		Contribution to Risk From			
			Systematic		Residual	
	Value	Change[1]	Value	Change[1]	Value	Change[1]
Annualised Expected Volatility	2.96%	-0.01%	2.27%	-0.02%	1.90%	0.00%
Monthly Expected 95% VaR	1.41%	-0.01%	1.08%	-0.01%	0.90%	0.00%
Monthly Expected 99% VaR	1.99%	-0.01%	1.53%	-0.01%	1.27%	0.00%
95% VaR Violation Frequency[2]	0.45%	0.45%				
Monthly Historical 95% CVaR	2.49%					
Monthly Modified 95% VaR	1.44%					
Monte Carlo 95% VaR, MSCI ACWI IMI TR Net Stress Period	1.81%					
Monte Carlo 95% VaR, Barclays US Agg. TR UH Stress Period	1.20%					
Monthly Expected 95% VaR Assuming Cross-Correlation=1	3.07%	3.07%				

Risk calculated over period from Mar 2010 to Jun 2020 [1]Change from previous month [2]Computed over 222 months. Change is relative to previous value, computed over 221 months.



Source: Albourne.

Note: Hypothetical analysis, based on Aug. 1 allocaitons

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Small Contributor to Risk Budget

Portable Alpha is expected to contribute 2bps of the 163bps total risk budget

	Active Risk Contribution
	4% Portable Alpha
Global Equity Public Equity	0.05%
Risk Mitigation	0.03%
Liquid Credit and Alternative Liquid Credit	0.07%
Liquid Real Assets	0.03%
Liquid Real Estate	0.01%
Portable Alpha Program	0.02%
Private Equity	0.72%
Private Credit	0.09%
Private Real Estate	0.22%
Private Real Assets	0.39%
Risk Parity (15% Volatility)	0.00%
Total Portfolio	**1.63%**

PERA

Phase II Ready for 2021

Phase Two Portfolio: $500 million to $1 billion; 8 Strategies to 12

Historical proforma return, volatility and Sharpe ratio improve in the Phase II portfolio

Performance Summary

		Return				Volatility			Sharpe Ratio		
	Jun 2020	YTD	2Y	3Y	Inception	2Y	3Y	Inception	2Y	3Y	Inception
Destination Portfolio Aug 1 (Updated July 2020) Proforma	1.52%	4.58%	7.89%	7.44%	9.73%	3.65%	3.23%	3.57%	1.62	1.76	2.34
Portable Alpha Phase II Proforma - Equal Weights	1.63%	5.19%	8.96%	8.61%	10.02%	3.04%	2.80%	3.19%	2.30	2.44	2.71
Portable Alpha Phase II Proforma - Adjustments II	1.65%	5.87%	9.14%	8.87%	10.00%	2.48%	2.31%	2.99%	2.89	3.08	2.88
HFRI EH: Equity MN	-0.26%	-2.18%	-0.87%	1.04%	2.42%	2.77%	2.70%	2.52%	-1.03	-0.27	0.41
DJ CS Equity MN	1.89%	-2.07%	-2.83%	-0.01%	0.52%	5.52%	5.47%	10.40%	-0.87	-0.32	-0.08
Δ of Portable Alpha Phase II Proforma - Equal Weights	0.12%	0.62%	1.07%	1.18%	0.29%	-0.61%	-0.42%	-0.38%	0.68	0.68	0.37
Δ of Portable Alpha Phase II Proforma - Adjustments II	0.13%	1.30%	1.25%	1.44%	0.27%	-1.16%	-0.92%	-0.57%	1.26	1.32	0.54

Source: Albourne.
Note: Hypothetical analysis

PERA

Global Equity Portfolio Review:

LeAnne Larrañaga-Ruffy, Co-Head of Alpha
Tom Toth, Wilshire Associates
Mike Krems, Aksia TorreyCove
Jeff Goldberger, Aksia TorreyCove

August 25, 2020

Strategic Rationale for Global Equity

- Exposure to economic growth opportunities
  - Long term capital appreciation driven by improving economic fundamentals
    - » Equity owners have a claim on the future stream of earnings
  - Dominant return driver for the Total Fund in aggregate
  - Opportunities to generate alpha through idiosyncratic exposure in both liquid and illiquid markets
    - » Public market strategies may be index-oriented or active strategies
    - » Private company investments both domestically and internationally
      - o Include venture capital, growth equity, and buyouts which offer higher rates of return
      - o Universe of privately held companies is significantly larger than those that are publicly traded

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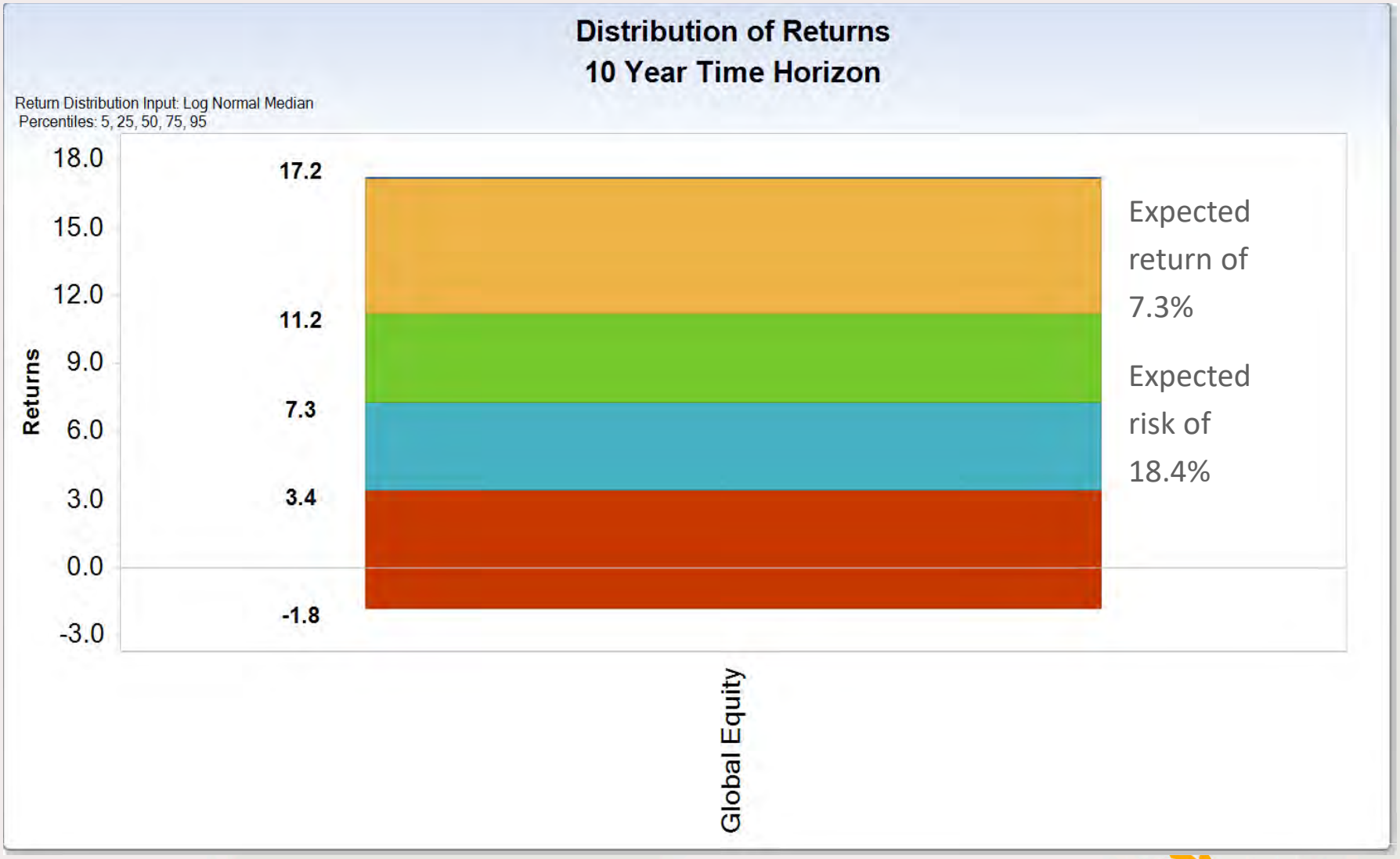
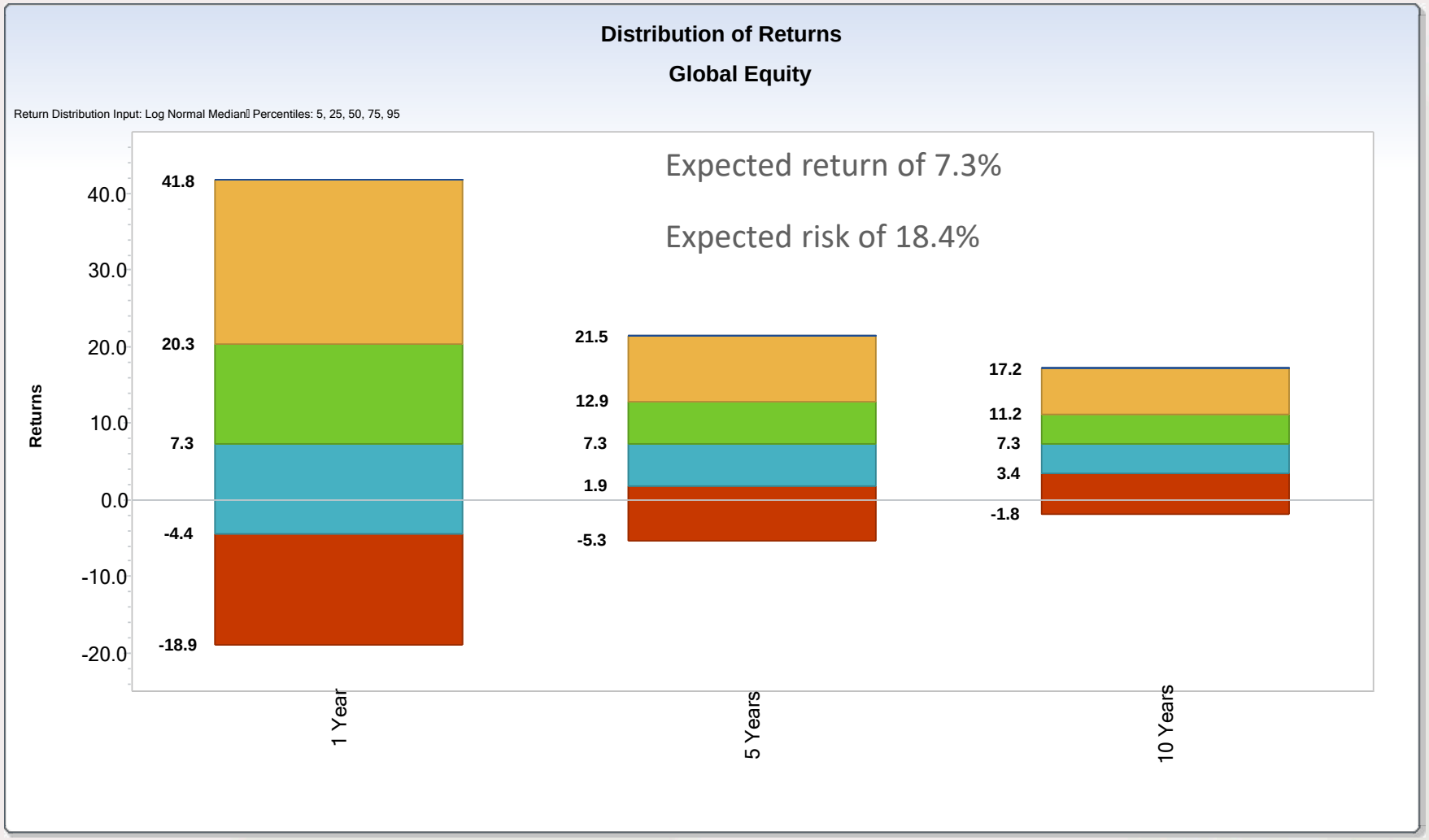
Global Equity Total Expected Return



Source: Wilshire Compass

PERA

Global Equity Total Expected Return



Source: Wilshire Compass

Key Equity Risks

Risk Category	Elements of Consideration	
Fundamental	• Revenue outlook • Earnings fluctuations • Cash flow profile	
Technical	• Momentum • Volatility • Sentiment	
Discount Rates	• Valuation • Leverage availability	• Impact due to changing interest rates, inflation expectations, perceived levels of risk
Liquidity	• Bid/Ask spreads • Illiquidity premium	• Opportunity cost • Cost of transacting in the private portfolio
Manager selection	• Market efficiency & ability to differentiate • Strategy complexity & due diligence insight	• Sourcing advantage • Operational advantage • Specialization • Market understanding • Persistence and quality of returns
Fee Impact	• Alpha erosion • Profit split between PERA and asset managers	

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Global Equity Portfolio Exposures

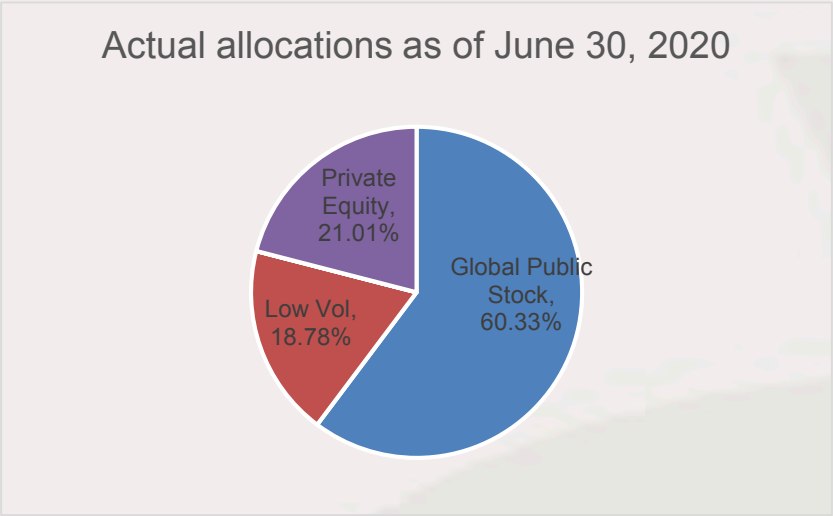
- Portfolio Construction Building Blocks
  - Global Public Stock (56% passive implementation)
    - U.S. (Large and Small Cap)
    - International Developed (Large and Small Cap)
    - Emerging Markets
  - Global Low Volatility (100% passive implementation)
  - LGIMA Overlay Adjusts physical exposures to match policy index
  - Private Equity
    - Buyout
    - Venture Capital

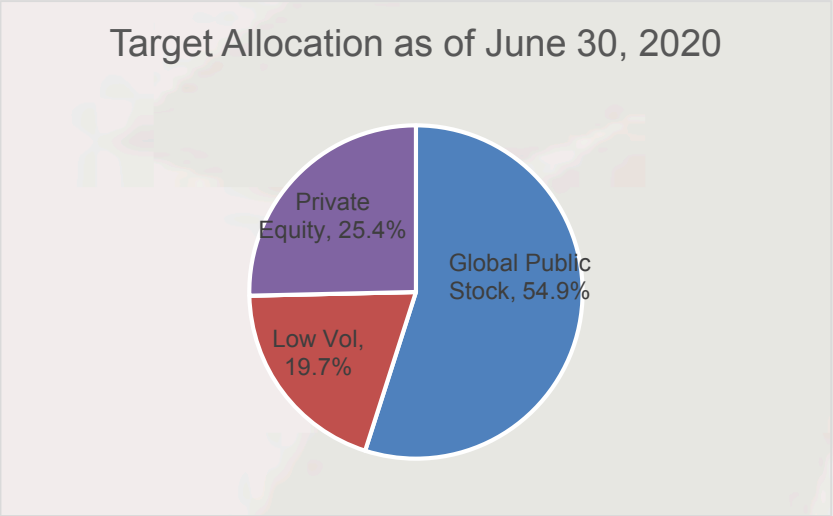
as of June 30, 2020	Long Term Target	Funded	Difference
Total Global Equity	35.5%	37.3%	1.8%
Global Public stock	19.5%	22.5%	3.0%
Global Low Volatility	7.0%	7.0%	0.0%
Private Equity	9.0%	7.8%	-1.2%

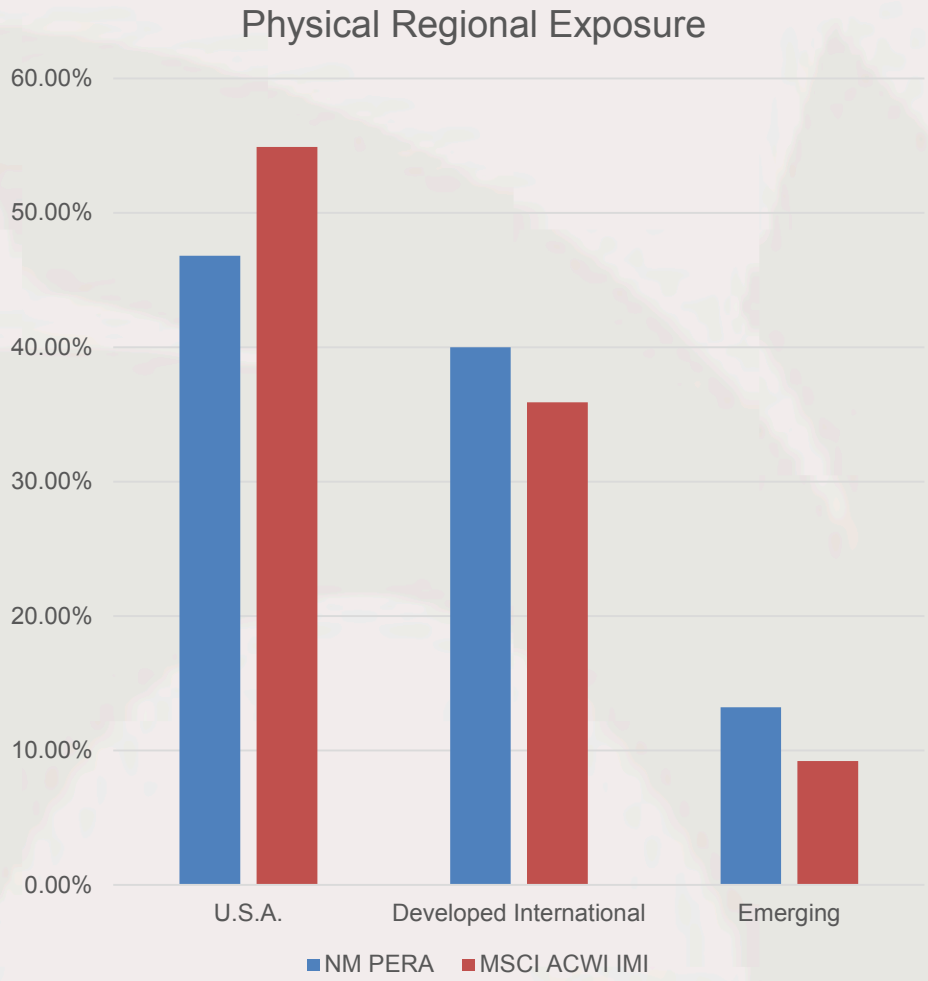
Source: Wilshire

PERA

Global Equity Portfolio Capital Allocation







Note: Does not include the LGIMA overlay

Source: Wilshire

PERA

Global Equity Performance Attribution

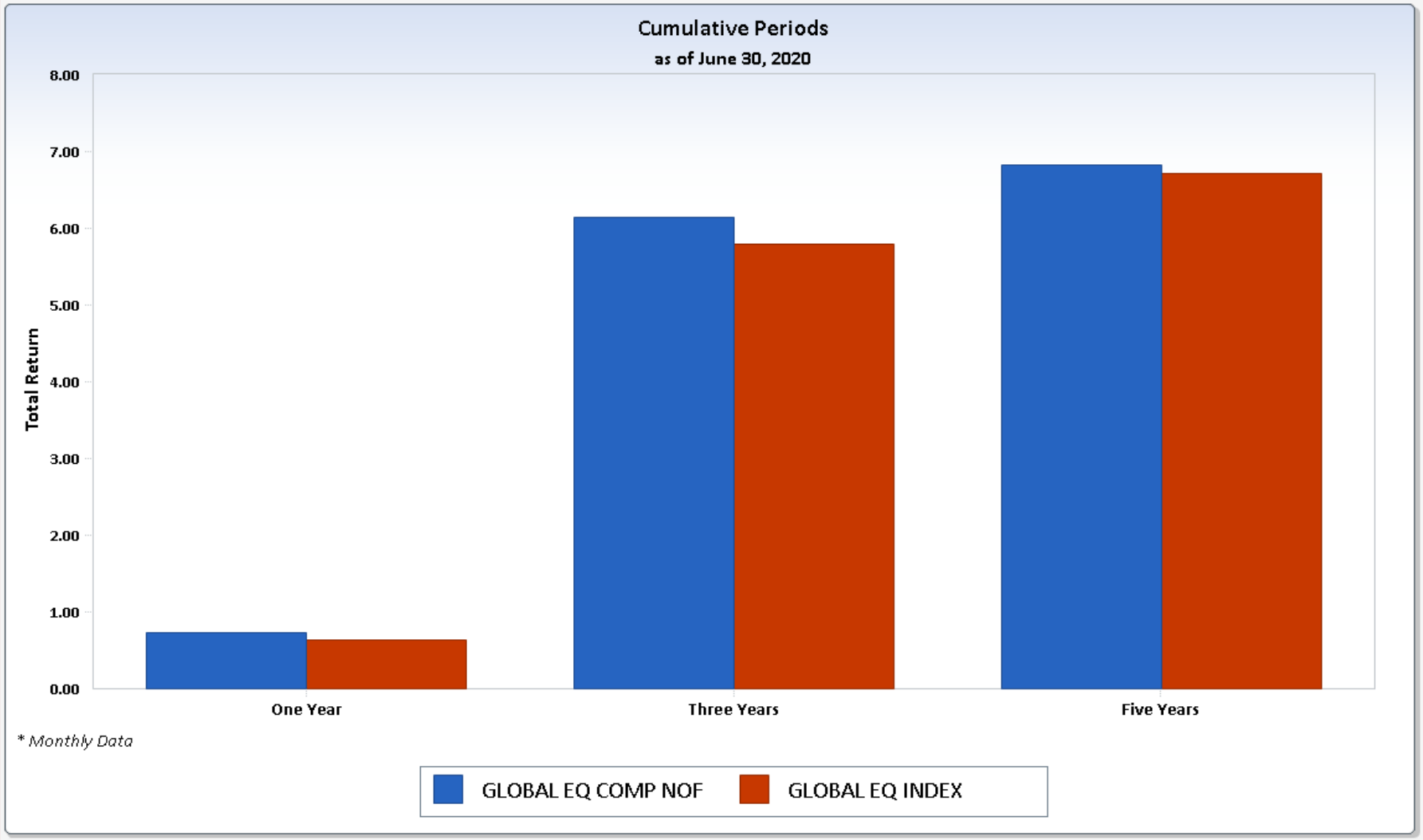
- Global Equity was positive for the 1 year ending June 30, 2020, exceeding the policy benchmark by 26 bps
  - Public Equity ended moderately positive yet lagged the benchmark by 32 bps, and showed meaningful levels of volatility
  - Private Equity has been a consistent driver of returns due to strong manager selection, exceeding the benchmark by 119 bps
    - Continue measured pace of commitments to increase exposure across vintage years
    - Underweight vs. target allocation detracted from Global Equity returns over last year
  - Low Volatility Equity provided downside protection in the pandemic drawdown, yet did not rally as dramatically in the 2nd quarter and posted a negative return for the 1 year
  - LGIMA structural overlay has added value by adding U.S. equity exposure relative to non-U.S. exposure to bring geographic exposures in line with policy index

1 year - 6/30/20	NM PERA		Policy		*Difference*		Net Management Effects		
	Weight	Return	Weight	Return	Weight	Return	Allocation	Selection	Total
GLOBAL EQUITY	**39.03**	**0.71**	**38.55**	**0.45**	0.48	0.26	**-0.02**	**0.05**	**0.04**
Global Public Stock	24.63	0.85	22.55	1.17	2.08	-0.32	0.06	-0.07	-0.02
Global Low Volatility	6.89	-2.14	7.00	-2.50	-0.11	0.36	-0.03	0.02	-0.01
Hedged Equity	0.14	-7.08	0.00	-2.50	0.14	-4.58	0.09	-0.08	0.01
Private Equity	7.38	2.36	9.00	1.17	-1.62	1.19	-0.25	0.18	-0.06
LGIMA Global Equity Overlay	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11

Source: BNY Mellon

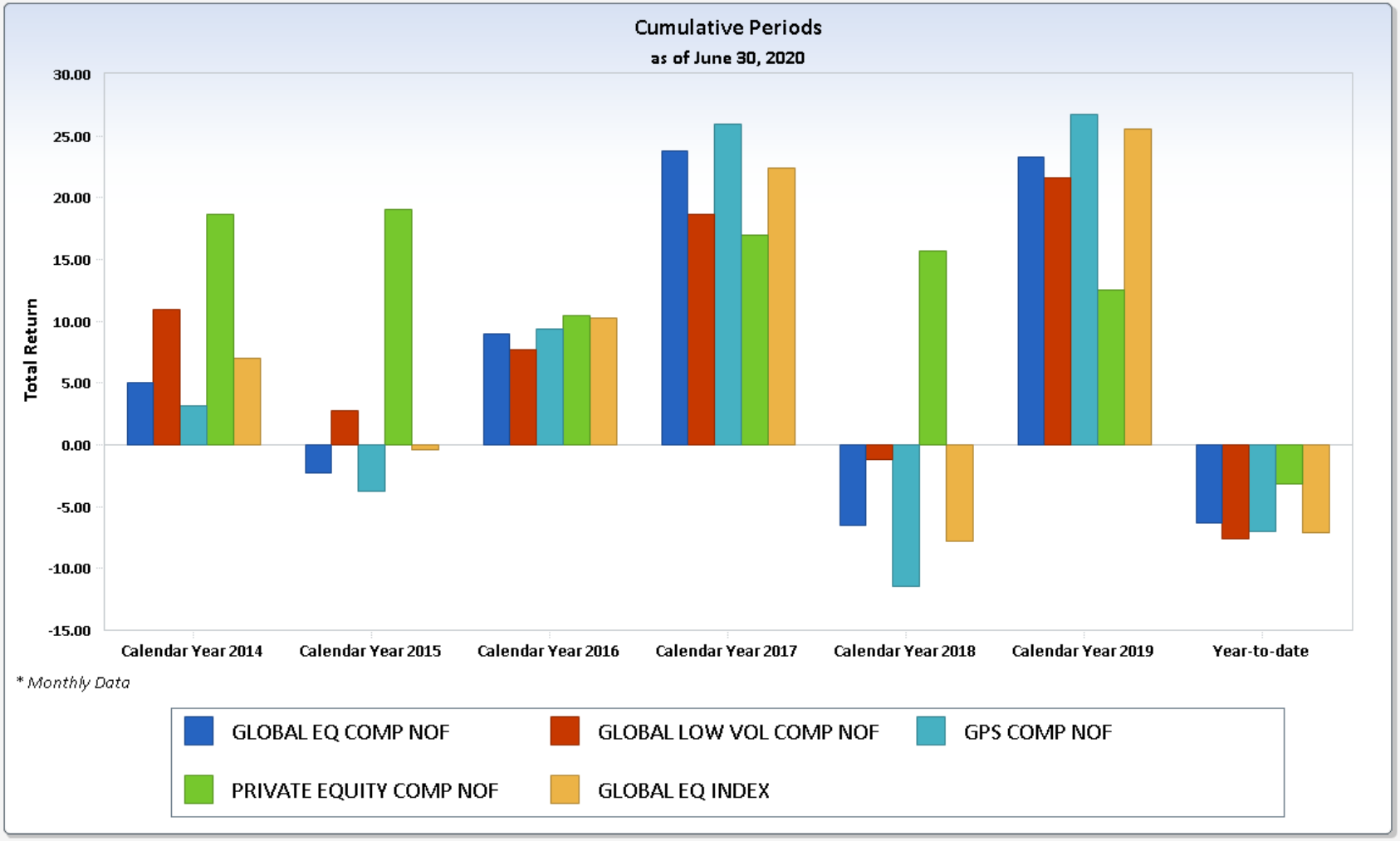
PERA

Global Equity Performance



Source: Wilshire Compass

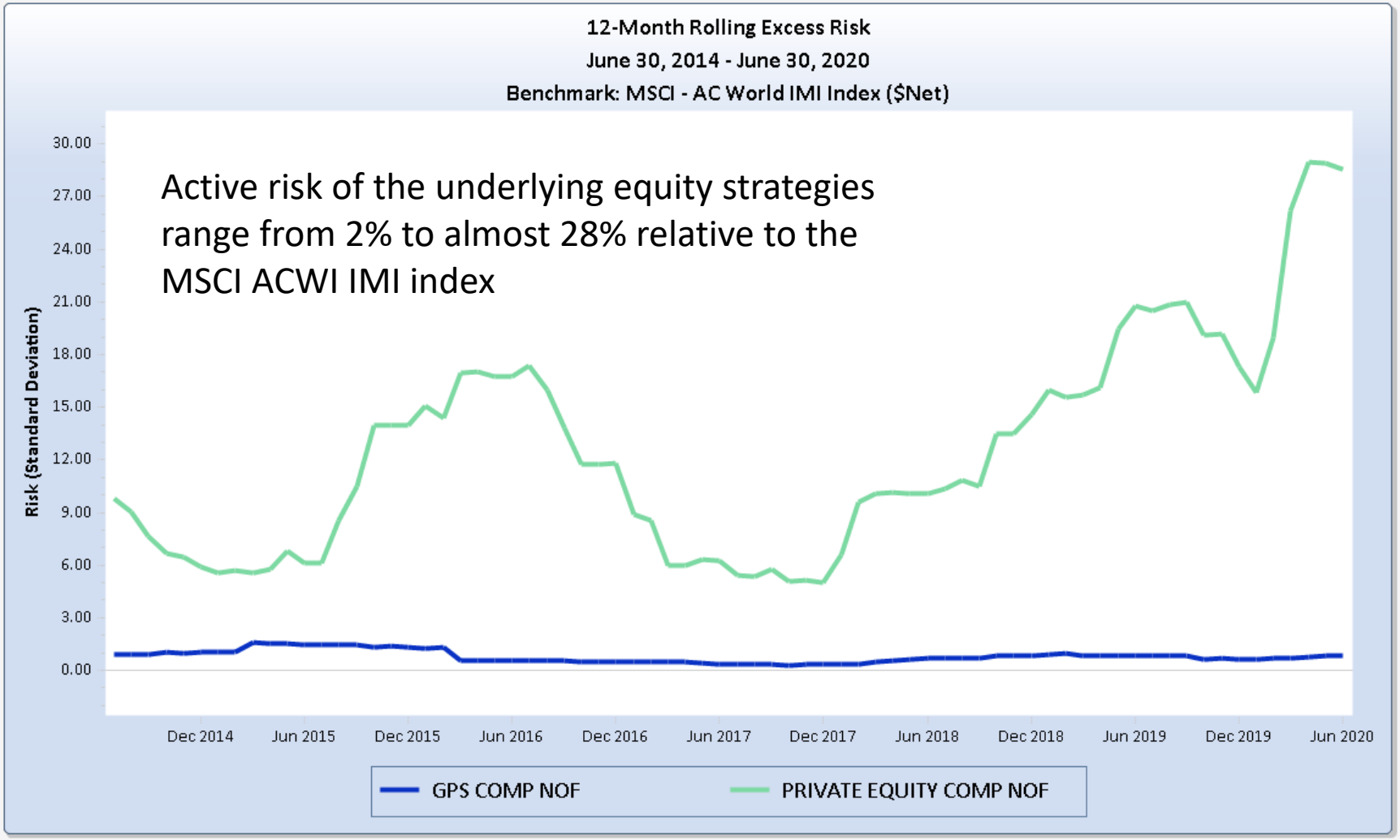
Global Equity – Annual Strategy Returns



Source: Wilshire Compass

PERA

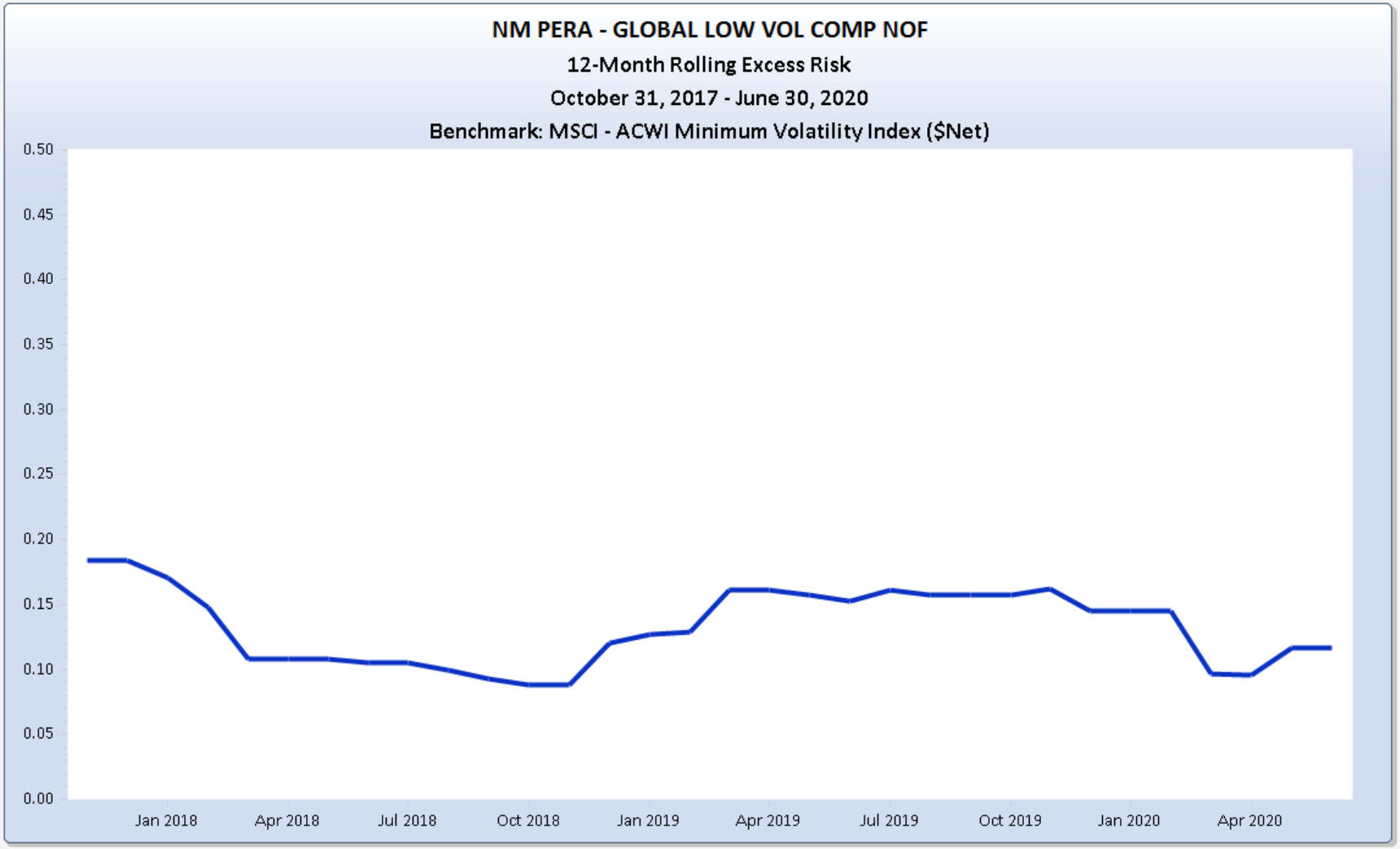
Global Equity Tracking Error – ACWI IMI



Source: Wilshire Compass

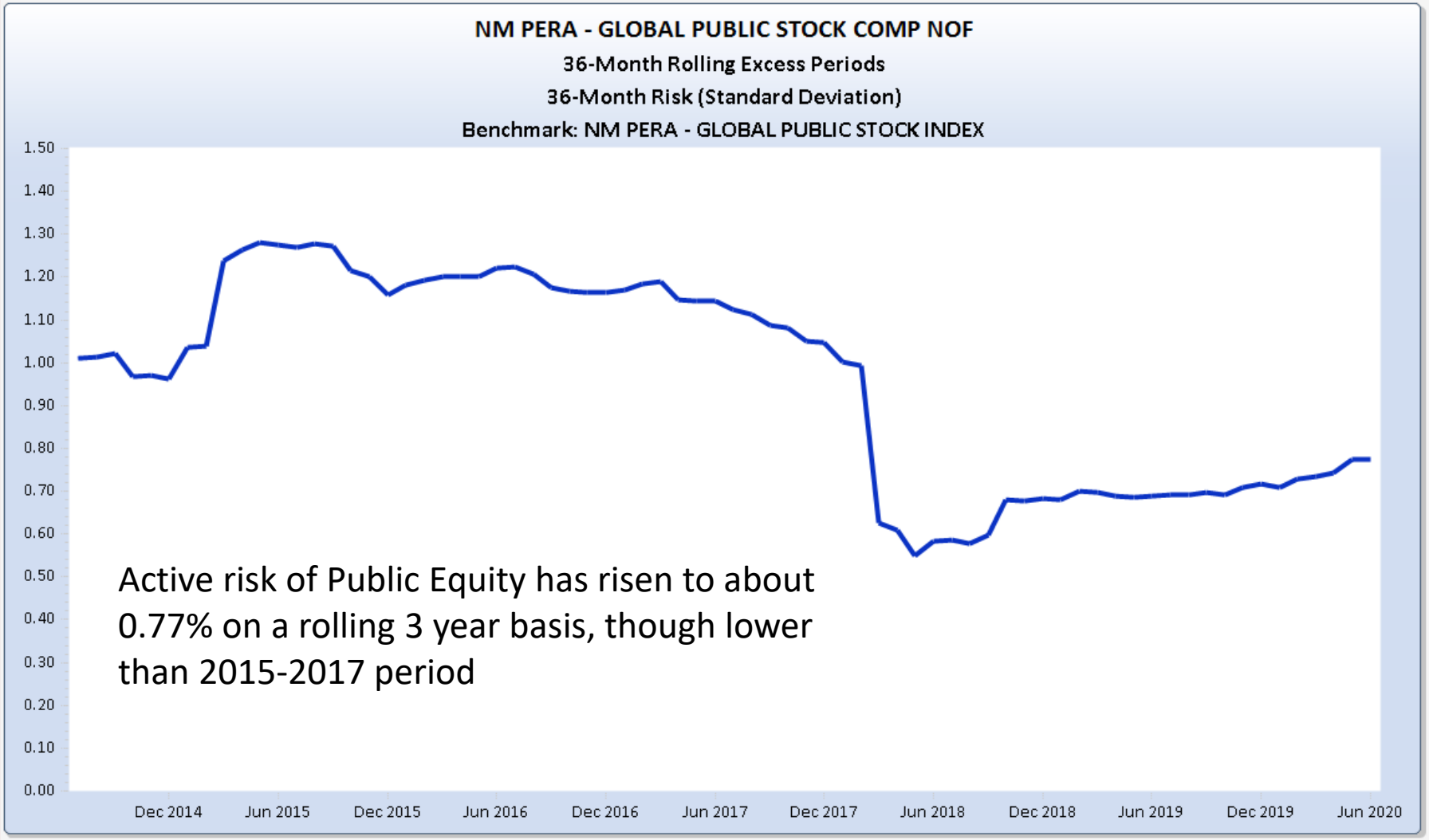
PERA

Global Equity Tracking Error- ACWI Min Vol



Source: Wilshire Compass

Global Equity Tracking Error – Public Equity



Active risk of Public Equity has risen to about 0.77% on a rolling 3 year basis, though lower than 2015-2017 period

Source: Wilshire Compass

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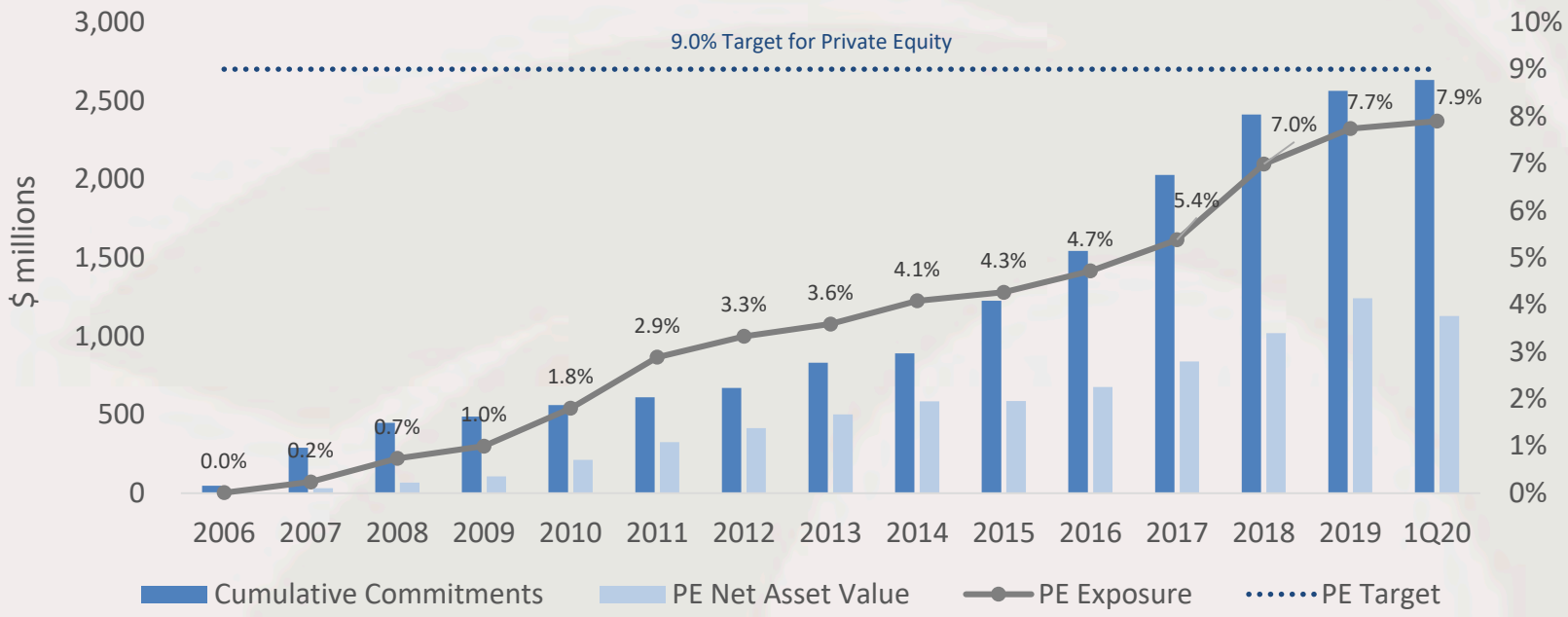
Private Equity Review

- PERA began investing in private equity in 2006 and has a current target of 9.0%
- As of March 31, 2020, PERA has committed approximately $2.6 billion to 56 private equity funds/34 GPs
- As of March 31, 2020, PERA had total plan assets of ~$14.3 billion and a private equity program with ~$1.1 billion in net asset value, or an overall exposure of 7.9%.



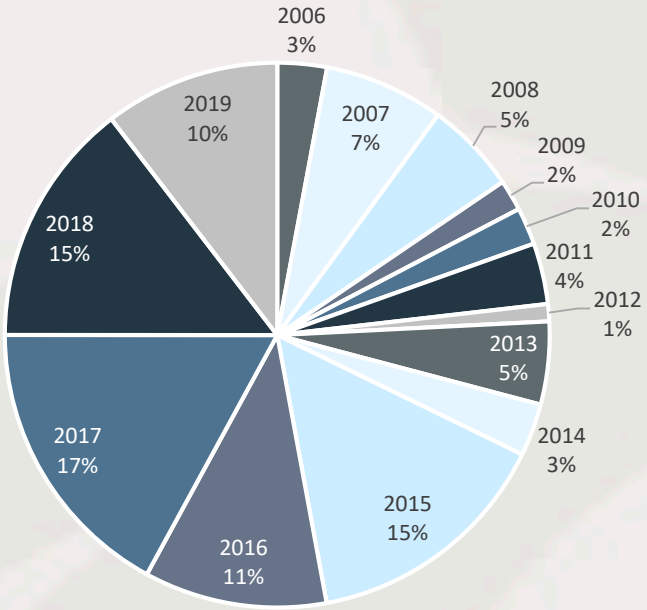
Source: Aksia TorreyCove

Private Equity Review

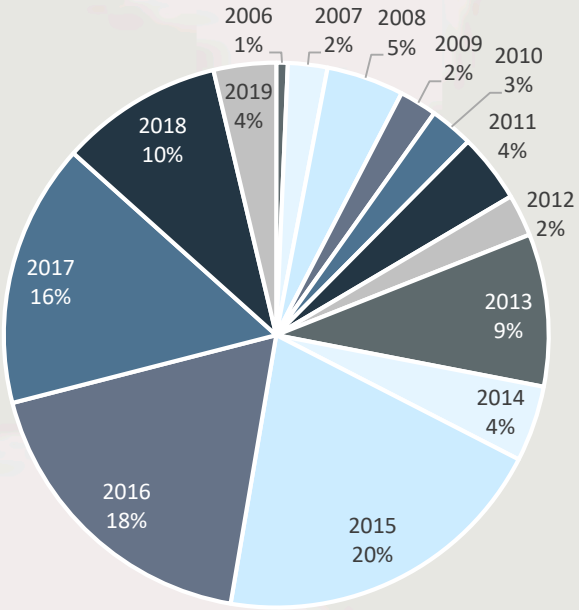
- PERA committed $787 million to private equity funds with vintage years between 2006 and 2014 for an average of $87 million per year.
- For 2015 through 2019 vintage funds, PERA committed a total of $1.6 billion, averaging $331 million per year.
- There is sufficient diversification by vintage year

Vintage Year Exposures

By Commitment Amount



By Fair Market Value



Source: Aksia TorreyCove as of March 31, 2020

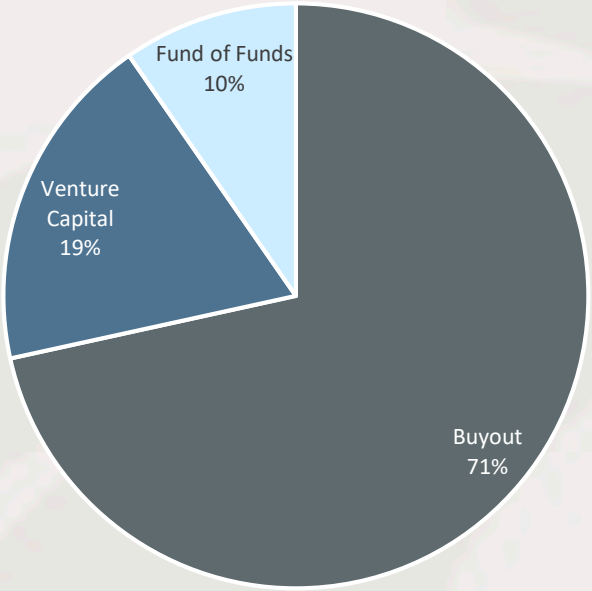
PERA

Private Equity Review

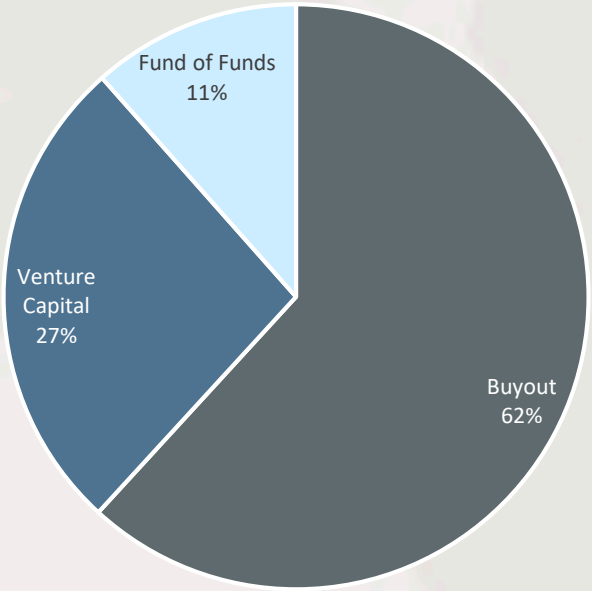
- About two-thirds of overall private equity market value is from funds that focus on control buyouts.
- The underlying commitments made by the Fund-of-Funds are also largely focused on funds that pursue control buyouts with a focus on emerging markets and small/emerging managers in a Fund of One Structure.
- The sub-sector exposure approximates the opportunity set available for investors of PERA's size.

Sub-Sector Exposures

By Commitment Amount



By Fair Market Value



Source: Aksia TorreyCove as of March 31, 2020

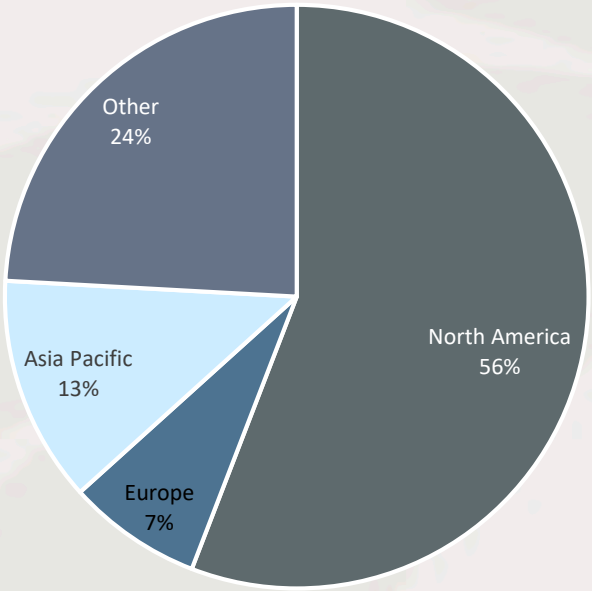
PERA

Private Equity Review

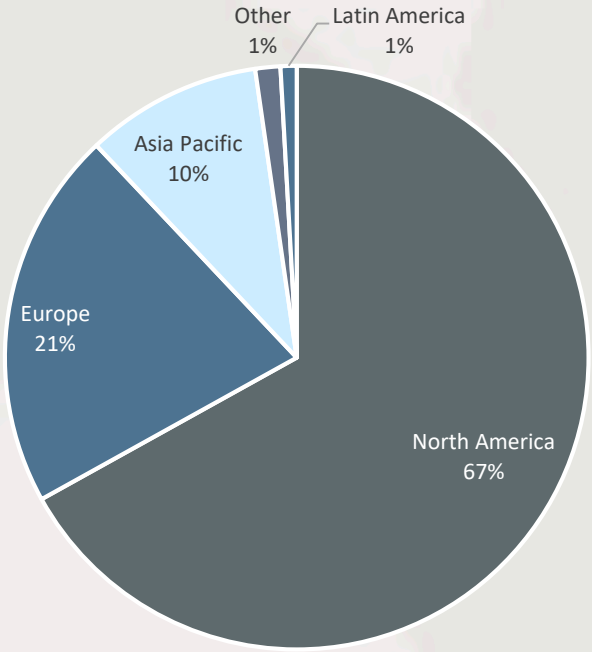
- North America makes up approximately two thirds of portfolio market value.
- The portfolio includes significant exposure to Europe and the Asia Pacific region, at 21% and 10%, respectively, with the rest of the world comprising about 2% of portfolio value.
- The MSCI ACWI IMI has significantly less European exposure and significantly more "other" exposure than PERA.

Geographic Exposures

MSCI ACWI IMI



Commitments - Fund Level



1 All data as of March 31, 2020.
2 PERA data excludes companies for which geography is not provided

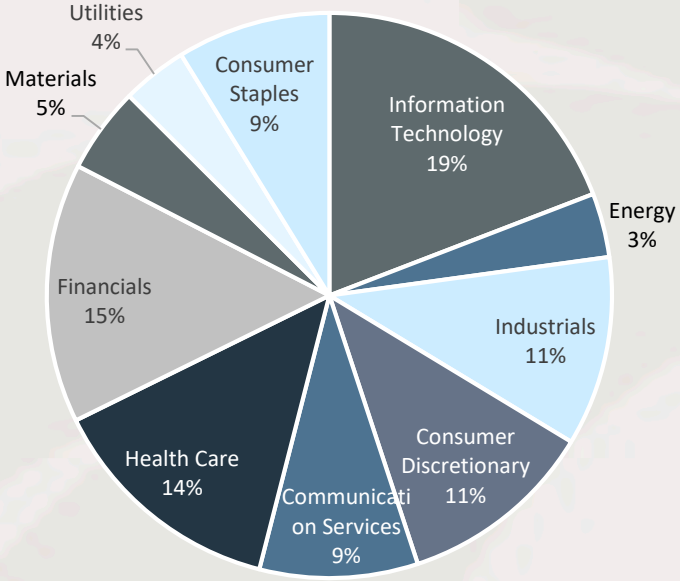
PERA

Private Equity Review

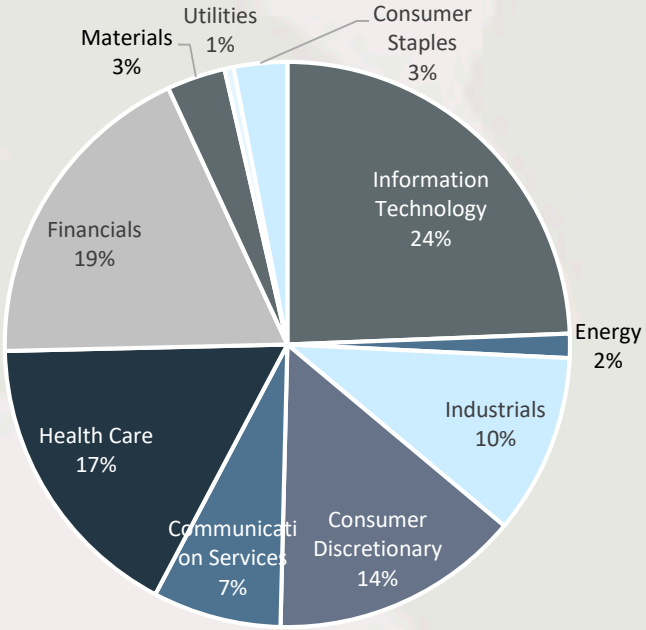
- The private equity portfolio is broadly diversified by industry.
- The portfolio has the greatest exposures to information technology (24%), financials (19%), health care (17%), consumer discretionary (14%), and industrials (10%).
- The MSCI ACWI IMI has very similar exposures in most industries.

Sector Exposures

MSCI ACWI IMI



PERA FMV – Portfolio Company Level

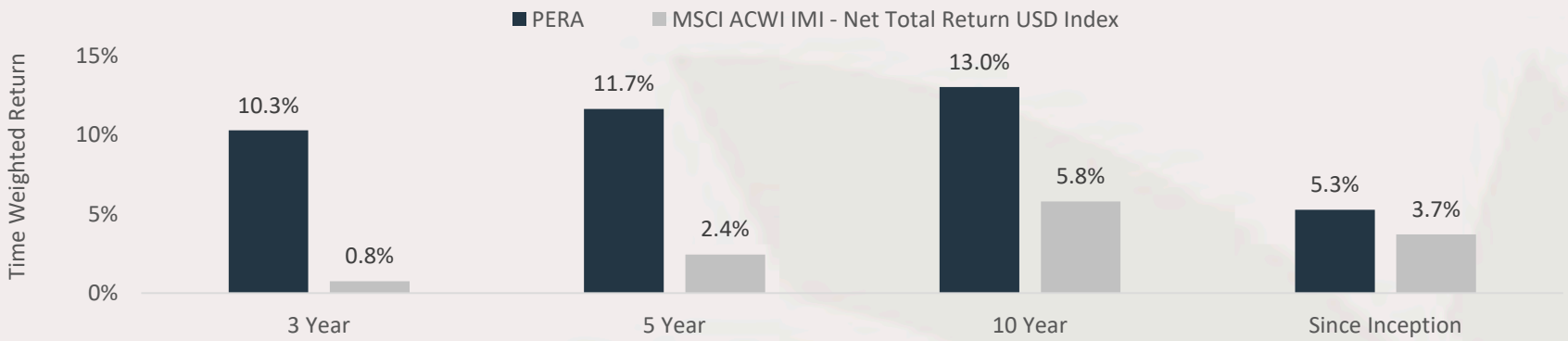


Source: All data as of March 31, 2020. Both MSCI ACWI IMI and PERA exposure excludes real estate.

Source: TorreyCove

PERA

Private Equity Performance



Strategy	Sub-Strategy	Commitment	Contributions	Distributions	Fair Market Value	Total Value to Paid-In	IRR
Buyout	Large	965,058,716	664,527,034	472,502,518	433,382,823	1.39x	11.1%
	Medium	845,227,338	492,382,528	447,763,891	249,865,202	1.47x	11.4%
	Small	50,000,000	29,758,779	31,430,108	14,745,976	1.55x	16.1%
Venture Capital	Diversified	45,000,000	43,935,490	47,371,254	43,410,811	2.07x	15.0%
	Late/Growth	370,962,000	219,993,732	179,048,104	177,050,480	1.62x	15.1%
	Early	70,000,000	60,625,000	9,126,873	80,423,162	1.48x	11.4%
Fund-of-Funds	Other	250,000,000	147,579,594	36,477,999	130,314,195	1.13x	6.2%
Total		**2,596,248,054**	**1,658,802,157**	**1,223,720,746**	**1,129,192,649**	**1.45x**	**11.9%**

Source: Aksia TorreyCove. All data as of March 31, 2020. Since Inception returns begin December 31, 2006.

PERA

Private Equity Performance

- PERA has generated an IRR of 11.4% over five years and 13.2% over ten years.
- Compared with multiple beta-adjusted public market equivalent measures, PERA's private equity activities have generated consistent and significant alpha.

	1 Year	3 Year	5 Year	10 Year	Since Inception
PERA Net IRR	1.9%	10.0%	11.4%	13.2%	11.9%
Versus the MSCI ACWI IMI					
Beta Adjusted					
Long-Nickels Public Market Equivalent ("PME")	-13.9%	-0.2%	1.6%	5.6%	5.3%
Alpha	15.8%	10.2%	9.8%	7.6%	6.6%
Beta Adjusted					
KS-PME	1.15x	1.19x	1.23x	1.25x	1.24x
Direct Alpha Method	18.2%	10.0%	9.4%	7.0%	6.2%

Source: Aksia TorreyCove. All data as of March 31, 2020. Since Inception returns begin December 31, 2006. Beta adjustments have been made for industry and geography exposure versus the index. No company size or leverage adjustments have been made as that information is not known in aggregate across PERA's private equity portfolio.

PERA

Global Equity Portfolio Summary

- Portfolio Positioning
  - Total global equity portfolio has outperformed over 1, 3, and 5 year time periods
    - » Moderately defensively positioned from a market exposure (beta) perspective
      - o Beneficial pandemic market sell off, but hindered performance as equity markets have rallied strongly in 2nd quarter of 2020
    - » Private equity has been the strongest performing portion of the Global Equity portfolio over all time periods, including a 10 year return of 13.3% vs. public equity return of 9.2%
  - Remains diversified across equity opportunity set
    - » Evaluation of opportunities on both the liquid and illiquid side continues in bid to improve portfolio outcomes
      - o Value oriented opportunities in underperforming private companies
      - o Co-investments with high conviction GP's
  - Overlay implementation has reduced structural tracking error related to geographic and market capitalization tilts versus the policy index
    - » Focus alpha generation on managers' security selection

PERA

Aksia TorreyCove Partners LLC

Private Equity 101
June 2020

Aksia

www.aksia.com

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Agenda

I. Why Does Private Equity Exist?

II. Why Invest in Private Equity?

III. Private Equity Lexicon and Players

IV. Manager Selection in Private Equity

V. Investment Vehicles and the Secondary Market

Why Does Private Equity Exist?

Mission Statement for Private Equity

Long-term Value Creation is Maximized through Economic Alignment and Strong Governance

- Problem: Business owners often want to maximize long-term value. Management may make decisions in ways inconsistent with this goal.
- Shorter term thinking: Managers may optimize short-term profitability over longer term profitability. Not all long-term investments that should be made are made.
- Pet projects: Investments are made in projects that should not be pursued.
- Lack of economic alignment: Management's economic incentives may not align with the value-maximizing long-term goals of shareholders.

Private equity reduces this principal/agent problem through economic alignment and strong governance

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An Example: Investment in Software

Business Decision:

Whether to invest in a new software system. It is expensive to implement today, but over five years would help the company perform better for customers, be more competitive in the industry, and increase profits.

Decision	Expenses	Near-Term Profit	Long-Term Profit + Company Value
Do not invest in software	No Change	↑	↓
Invest in software	↑	↓	↑

Private Equity provides the economic alignment and governance to help achieve the outcomes that are most desired by business owners.

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Private Equity in Practice

Private Equity Capital Has Been Deployed in Many Types of Situations

- Start-up and Growth Capital: Private equity has provided the initial capital or growth financing for newer businesses
- Founder Sales: Private equity capital has offered a solution to the many small and middle-market business founder/owners looking to sell their company.
- Non-Core Divisions: Conglomerates often want to focus on core strategies and sell non-core divisions. Private equity serves a role in optimizing, repositioning, and selling these business to long-term owners which might not want to do the heavy lifting of a carve out.
- Strategic Repositioning: Many business owners would like a partner in executing a strategic transformation of their company, such as expanding to overseas markets or growing the company into adjacent market segments. Private equity firms can be this valuable partner.

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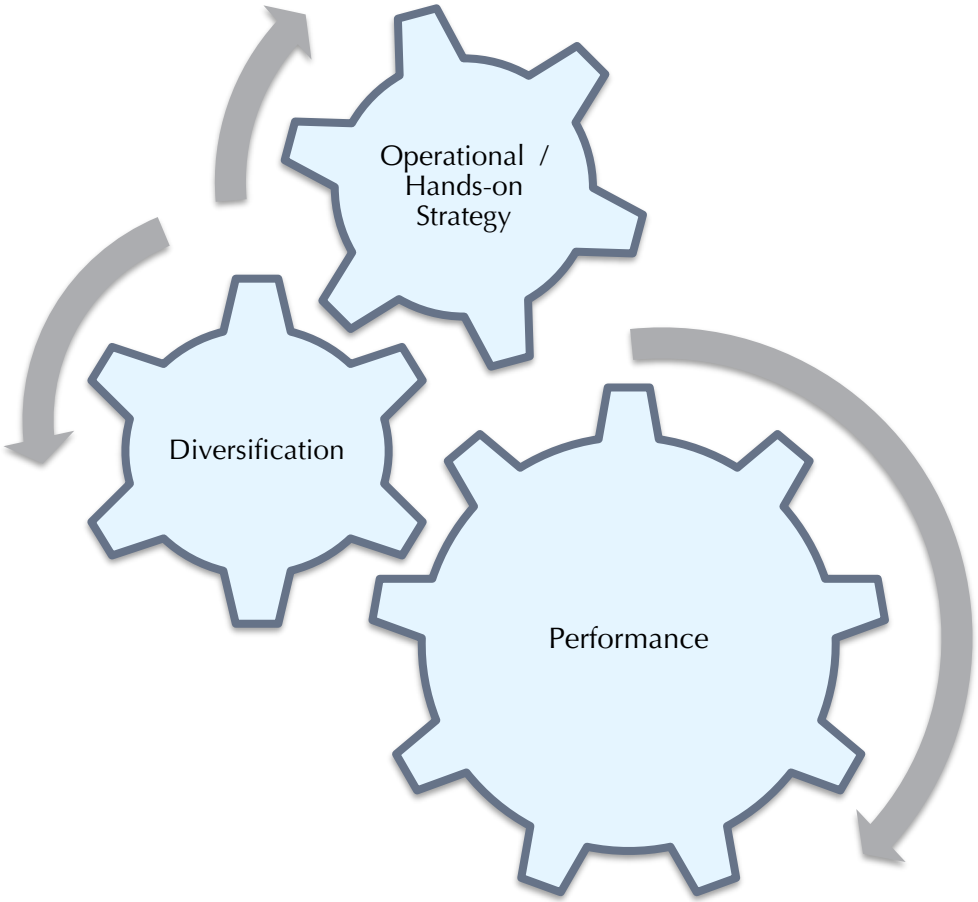
Why Invest in Private Equity?

Private Equity's Role in a Portfolio

Private Equity Generally Serves Three Roles in an Institutional Portfolio:

- Private equity offers a number of compelling reasons for institutional investors to consider the asset class as a complement to their traditional public equity exposure.



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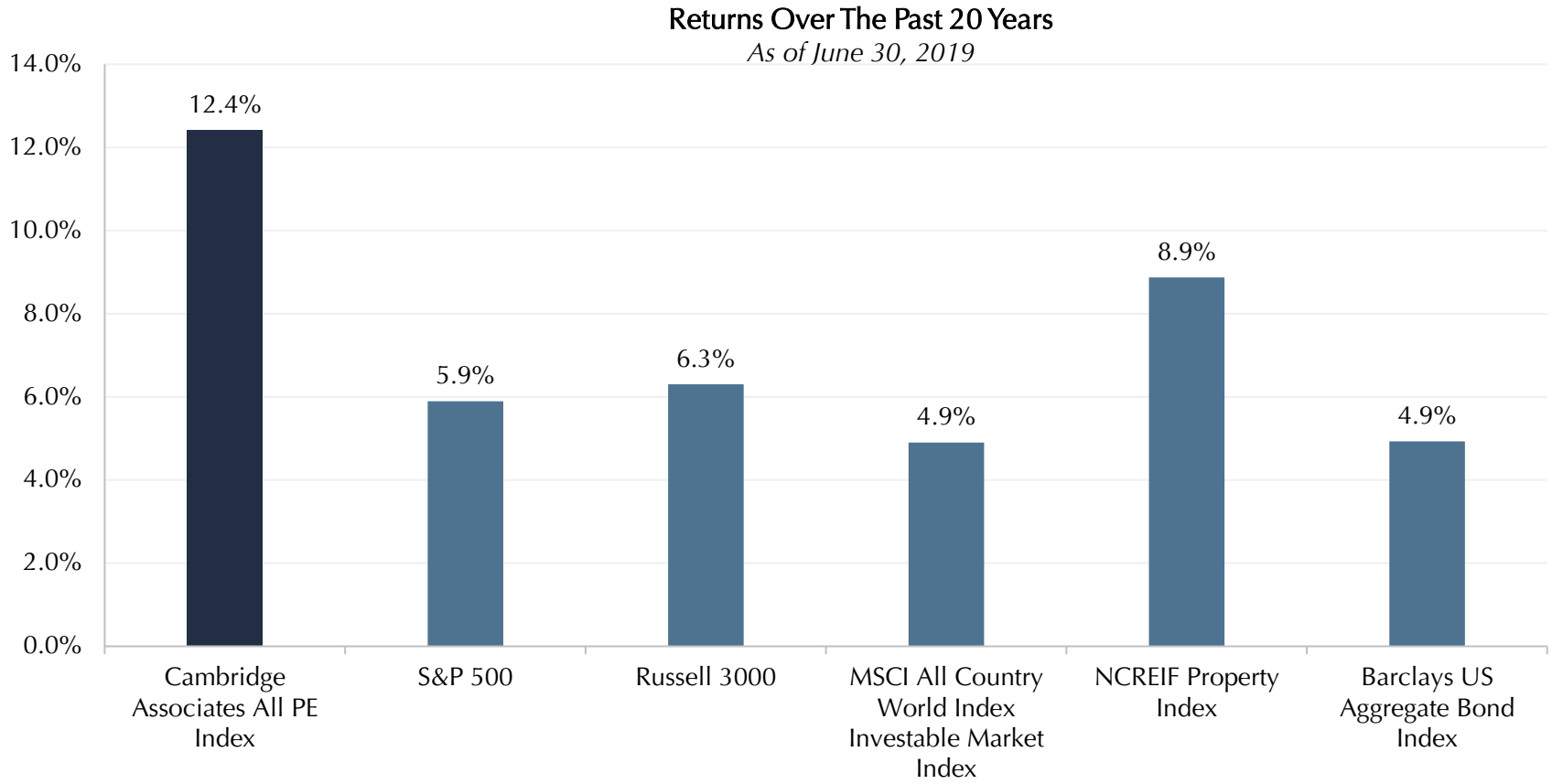
Role of Private Equity: Performance Enhancer

Over the last 20 years, Private Equity has significantly outperformed other asset classes:



Source: Cambridge Associates All PE Index – Cambridge Associates 20-year Pooled Horizon Returns (All Private Equity excluding Real Estate, Infrastructure, Fund of Funds, Secondary Funds). S&P 500 – Bloomberg. MSCI All Country World Index Investable Market Index – Bloomberg. NCREIF Property Index – Bloomberg. Barclays US Aggregate Bond Index – Bloomberg.

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What is Behind the Outperformance?

Private equity firms focus on initiatives and risk management to help drive returns

Whether to invest in a new software system. It is expensive to implement today, but over five years would help the company perform better for customers, be more competitive in the industry, and increase profits.

DRIVERS OF OUTPERFORMANCE:	▪ Strategic focus on high value-add initiatives. ▪ Ability to create a sense of urgency. ▪ Ability to upgrade management. ▪ Strong alignment of interests with management. Time horizons are aligned. ▪ Sophisticated use of capital markets. ▪ Advanced positioning of businesses for exit
MANAGED RISKS:	▪ Strong corporate governance. ▪ Pressure to meet quarterly earnings eliminated. Smart, long-term investments which depress earnings in the short term are viewed differently in a private context. ▪ Management is focused. Stock price movements are not a distraction. Incentives are aligned. Sharp focus on avoiding management "pet projects."

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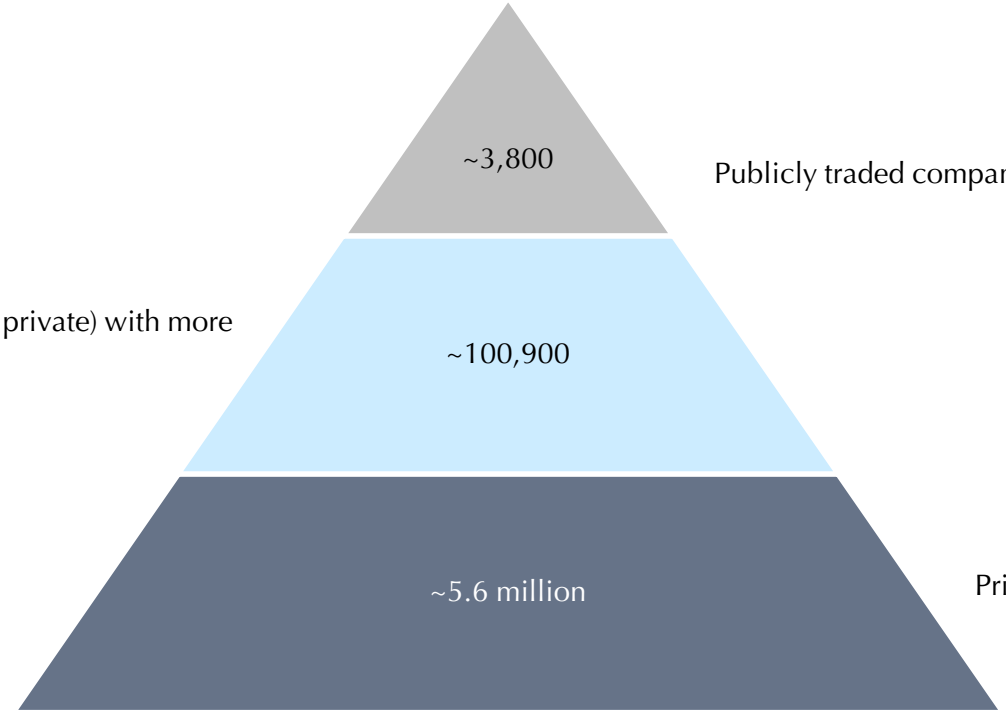
Private Equity Universe

Private equity offers a broader universe of investments compared to public equities

- The private equity strategy offers investors access to the large universe of companies that have not gone public yet or will never go public.
- Public companies comprise less than 0.7% of companies in the US



Source: U.S. Census Bureau's Annual Survey of Entrepreneurs 2016

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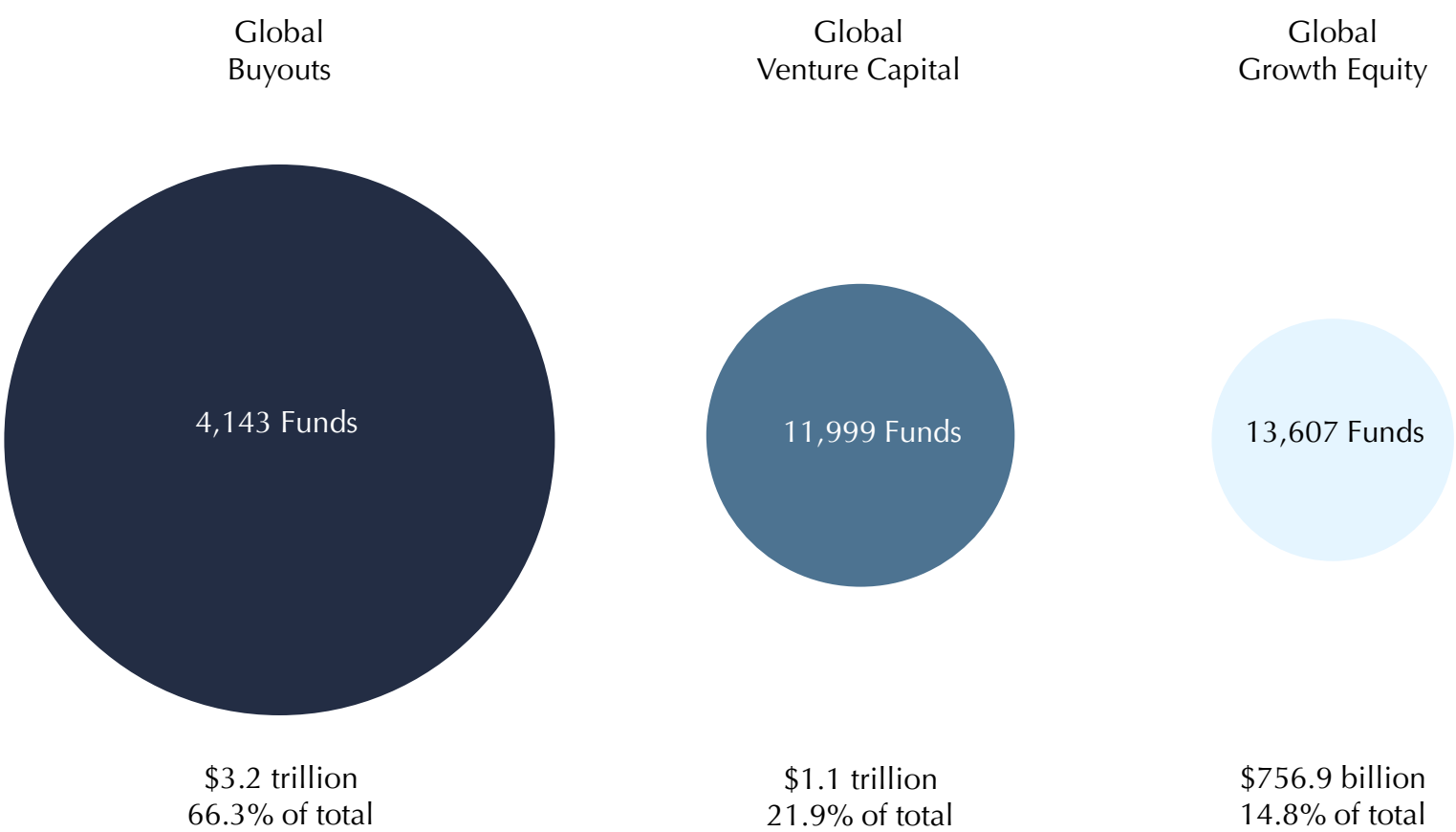
Private Equity Segment Size

Total Capital Raised: 2000 through 2019



Source: Preqin, latest available data as of 1/10/2020

Role of Private Equity: Diversifier

Correlations between asset classes

- Private equity is generally expected to provide some diversification benefits when combined with other asset classes due to correlations meaningfully below one.

	U.S. Large Cap	U.S. Mid Cap	U.S. Small Cap	U.S. Cash	U.S. Inv. Grade Corp. Bonds	Commodities	U.S. REITs	Private Equity
U.S. Large Cap	1.00							
U.S. Mid Cap	0.96	1.00						
U.S. Small Cap	0.91	0.95	1.00					
U.S. Cash	0.00	0.00	0.00	1.00				
U.S. Inv. Grade Corp. Bonds	0.00	0.00	0.00	-0.03	1.00			
Commodities	0.45	0.47	0.38	0.07	0.24	1.00		
U.S. REITs	0.72	0.75	0.73	-0.05	0.43	0.00	1.00	
Private Equity	0.73	0.75	0.69	0.04	0.18	0.00	0.00	1.00

Legend:
1 = Perfect Correlation
0 = No Correlation
-1 = Perfect Negative Correlation

Source: JPMorgan Long-Term Capital Market Assumptions 2019

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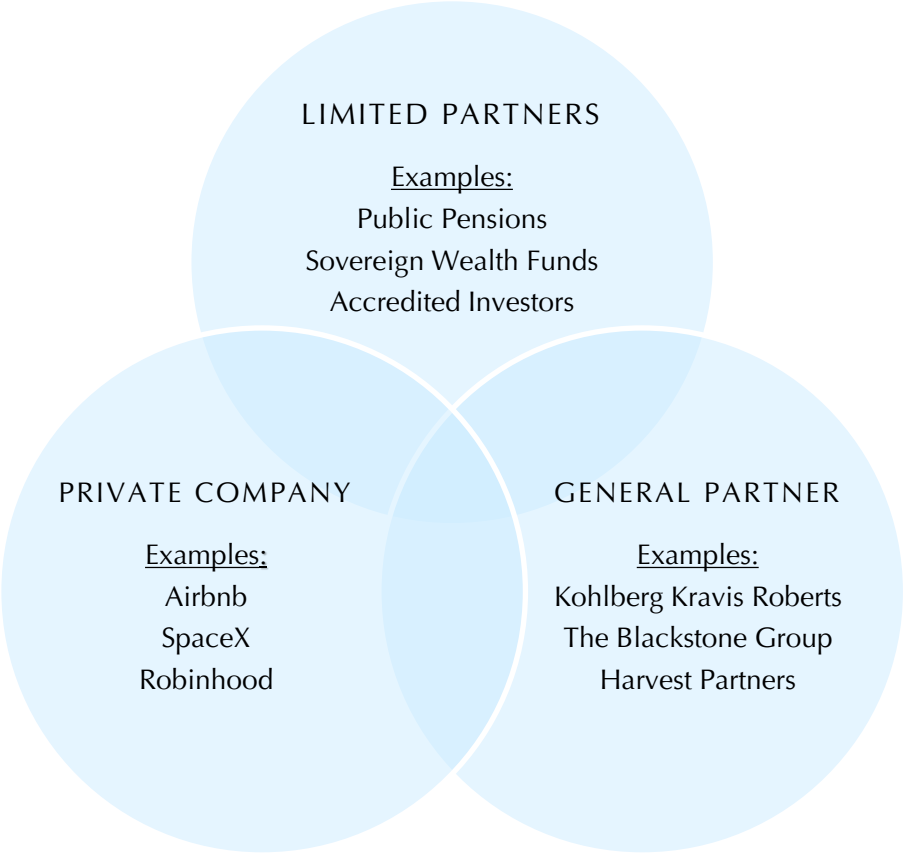
Private Equity Roles and Sub-Strategies

Private Equity Segment Size

- Private equity is an umbrella term for capital that is invested in privately held companies.
- Usually, a fund structure is used to facilitate investments and to allow for portfolio diversification.



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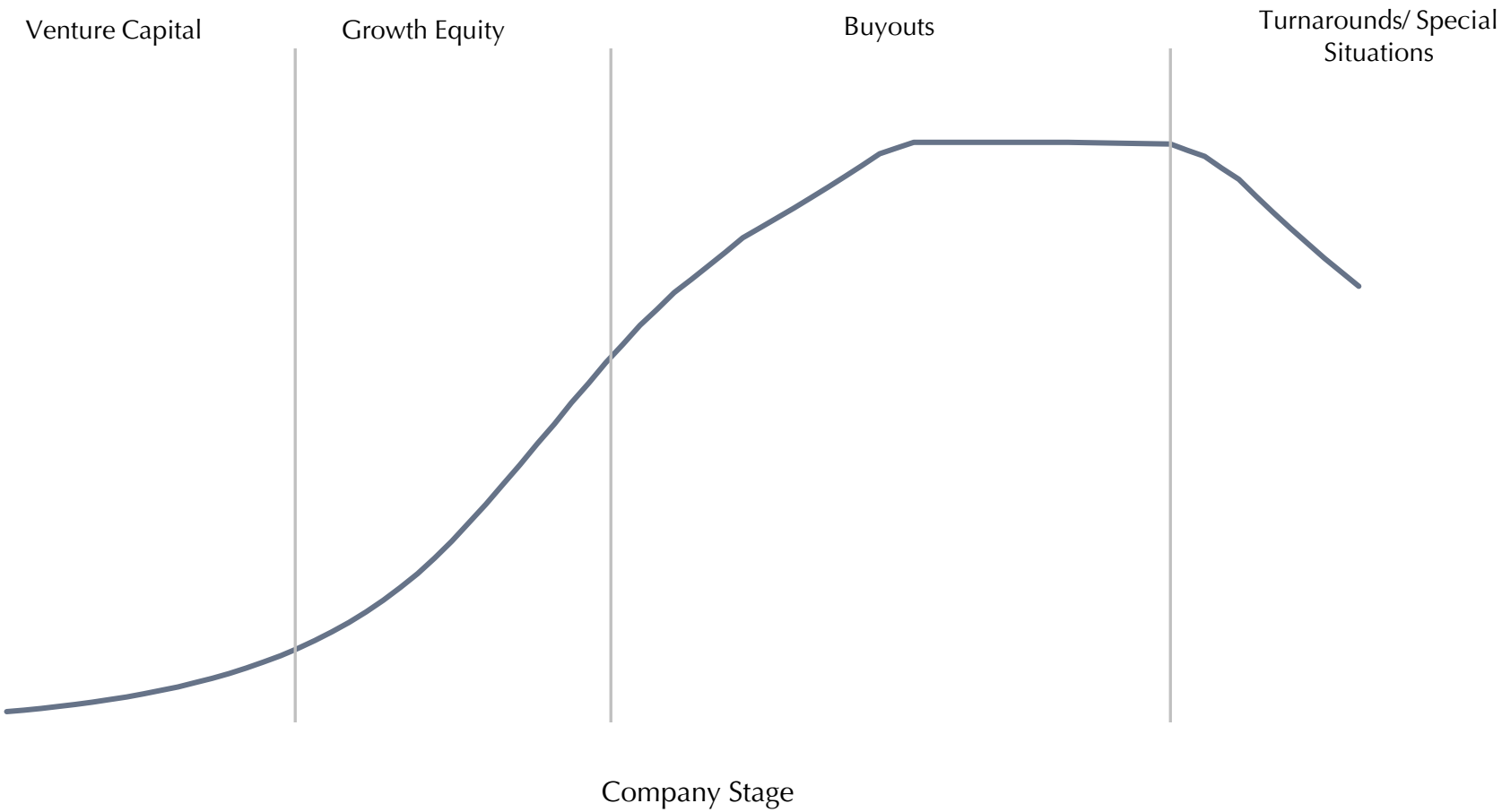
Private Equity Sub-Strategies



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Private Equity Strategies Defined

BUYOUTS (Small, Medium, Large/Mega)	Funds that invest equity to acquire businesses, usually financed in part with debt. We classify these firms based on the enterprise values of companies in which they invest: small – up to $200 million enterprise value; medium – $200 million to $1 billion; large – over $1 billion. Investment Strategies Include: • Strategic Repositioning: Expansion of resources (such as sales force), business lines, or geographies. • Buy and Build: Acquisition of a platform company with the plan of acquiring competitors and combining them to create a larger business while consolidating a fragmented industry. • Carve outs: Separation of a business from a parent company, often without a dedicated management team or business systems like accounting and IT. • Turnarounds: Equity investment into companies that are struggling with the goal of changing operations to positively impact profitability.
VENTURE CAPITAL (Early, Late, Diversified) and GROWTH EQUITY	Funds that make equity investments in nascent companies developing new technologies and/or services, typically in the Information Technology (IT) and Life Sciences sectors. Market Segments Include: • Early Stage: Pre-revenue or pre-earnings companies • Late Stage: Post-revenue companies experiencing rapid growth • Growth Equity: Profitable companies experiencing rapid growth, transitioning to Corporate Finance.
SPECIAL SITUATIONS (DISTRESSED DEBT, MEZZANINE, CREDIT-ORIENTED, SECONDARIES, OTHER)	Special Situations funds encompass many "outside the box" strategies. • Distressed debt strategies seek to invest in debt that is low relative to intrinsic value and which may convert to equity via a balance sheet restructuring. • Mezzanine investments are a combination of subordinated debt and equity securities and generally are in the middle of the capital structure between senior debt and equity in terms of priority of repayment. • Credit-oriented investments refer to any strategy that uses loans or debt as its primary investment instrument.

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Private Equity Fund Mechanics

What is a Private Equity Fund?

A private equity fund is a private joint venture to invest capital

- Sponsor expertise and investor capital join to make portfolio investments on a private/negotiated basis
- Investors invest as a limited partner (LP) or member in the fund:
  - Makes a capital commitment to Fund
  - Has limited participation in fund operations
- The Investment Manager/Sponsor acts as the general partner (GP):
  - Makes investment decisions and executes investments
  - Manages day-to-day Fund operations
  - Provides services for portfolio companies

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Life Cycle of a Typical Private Equity Fund

Phase I (Formation)

Phase II (Investment Period)

Phase III (Harvesting)

Year 0

- GP Forms new Fund
- LPs Commit Capital

Year 1 – Year 5

- Invests in various companies, calling capital from LPs for each investment
- GPs seek to improve companies' governance and reporting
- GPs seek to accelerate growth & profitability of companies

Year 6 – 10 (up to 12+)

- Ongoing improvements
- GP seeks to sell companies in a strategic manner. Proceeds are distributed to LPs as each sale occurs.

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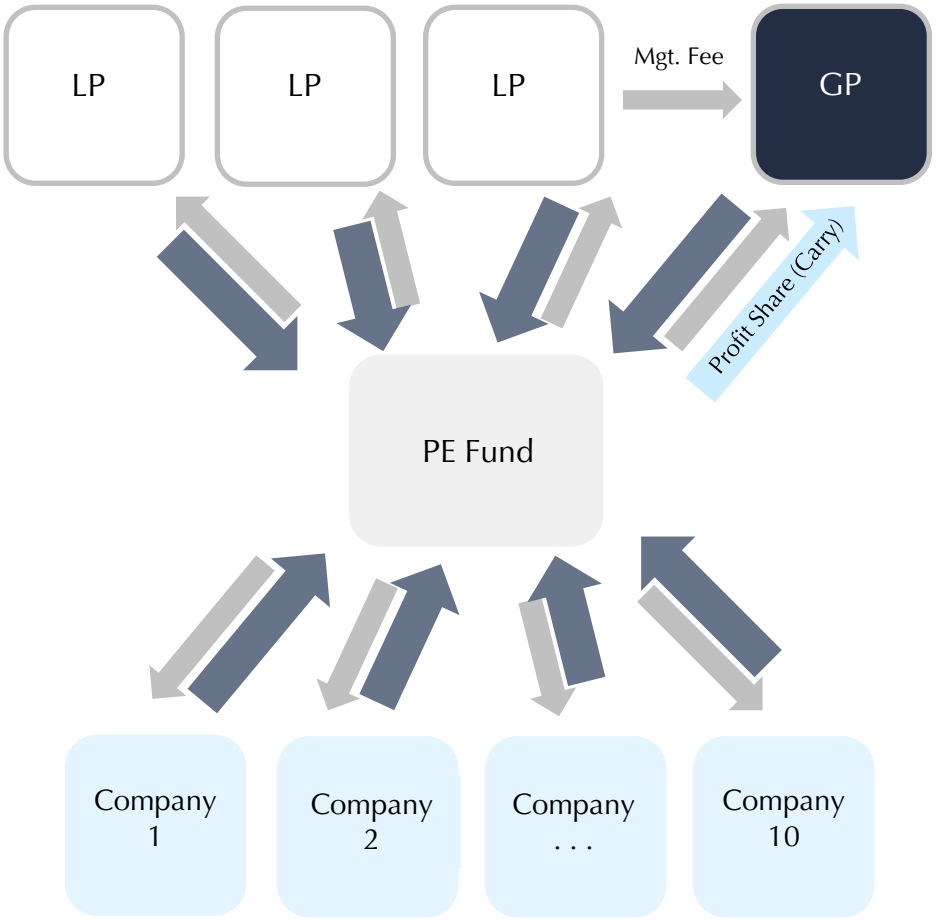
Fund Mechanics



- Both LPs and GPs make commitments to the fund
- Capital commitments are called from investors as companies are identified for investment

- Investment into companies
- Later, companies are sold and sale proceeds are returned to the fund

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General Partner Economics

GP Compensation is a Combination of Fixed Fee and Profit-Sharing

- The general partner gets paid for its expertise as investment manager.
- Each fund agreement is individually negotiated so terms will vary across funds, but "market" terms are shown to the right.
- Many fund agreements also allow the GP to charge "transaction fees" to portfolio companies – the trend is toward these fees being shared fully with investors, thereby lowering the investors effective cost.

FIXED FEE:

- "Management fee": 1%-2% annually of committed capital. The rationale is to cover the fund overhead costs. Often refunded prior to distribution of profit share to GP.

PROFIT-SHARING:

- "Carried interest": Typically 20% of profit after capital returned to investors, usually after a preferred return of 8% (non-venture capital funds). Collected by the GP as investments are sold and profits are realized.

GENERAL PARTNER COMMITMENT:

- The fund's general partner puts its own capital at risk, typically from 1% to 5% of the total fund size, helping to create additional alignment of interest. Ideally, it's a significant portion of the GP's net worth.

THE BASIC PRINCIPLE

The potential for a share of profits serves to align GP and LP interests towards maximizing profit. The General Partner commitment serves to sensitize the GP to investment risk.

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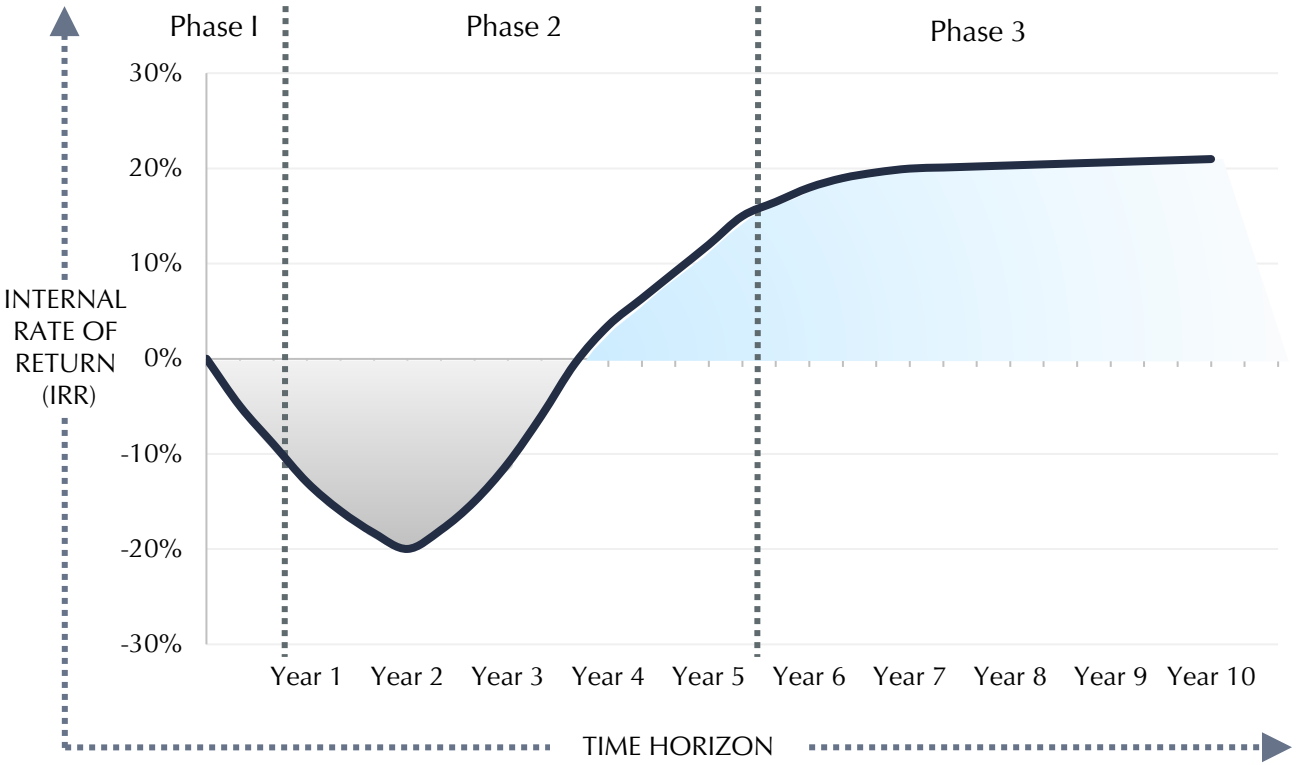
The J-Curve Effect

The Private Equity J-Curve: Illustrative Example



Notes:

- Generally, private equity investments held less than three years tend to have low or negative returns.
- This is the result of management fees charged at the initiation of a fund while investment and growth in value occur over a number of years.
- Early negative returns are not predictive of the ultimate fund performance as growth in value of the investments over time typically offsets fees and generates investor profits.

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Performance Measurement

Primary Measure – Internal Rate of Return (IRR) and Total-Value-to-Paid-in (TVPI)

- Generally, private equity returns are measured using IRR and TVPI.
  - IRR: The rate of return which makes the present value of all capital invested equal the present value of all capital returned and unrealized value.
  - TVPI: (capital realized + unrealized value)/invested capital. A measure over 1x indicates a profitable investment.
- Both measures are based on the actual cash flows experienced by limited partners.

Common Benchmarks

- Opportunity Cost Benchmark: A public equity index is often used to approximate the opportunity cost of investing in private equity. To account for the additional illiquidity in private equity, an opportunity cost benchmark will often have an illiquidity premium added. As an example, the MSCI ACWI IMI Index + 200 bps.
- Peer Benchmarks: These benchmarks measure the performance of available investment options within the private equity universe. Providers of such benchmarks include Burgiss, Cambridge Associates, Thomson/Reuters, State Street Bank, and ILPA (Institutional Limited Partners Association).

Public-Market Equivalent ("PME") Measures

- Long Nickels: Uses the actual cash flows experienced by a private equity investor to calculate an IRR reflecting the return an investor would have achieved from a selected index if they had invested in that index instead.
- KS-PME: Similar methodology as Long-Nickels but seeks to answer the question, how much wealthier (as a multiple) is an investor as a result of investing in private equity instead of the reference benchmark.
- Direct Alpha: Similar approach to KS-PME, but produces a measure of alpha of private equity relative to the benchmark.

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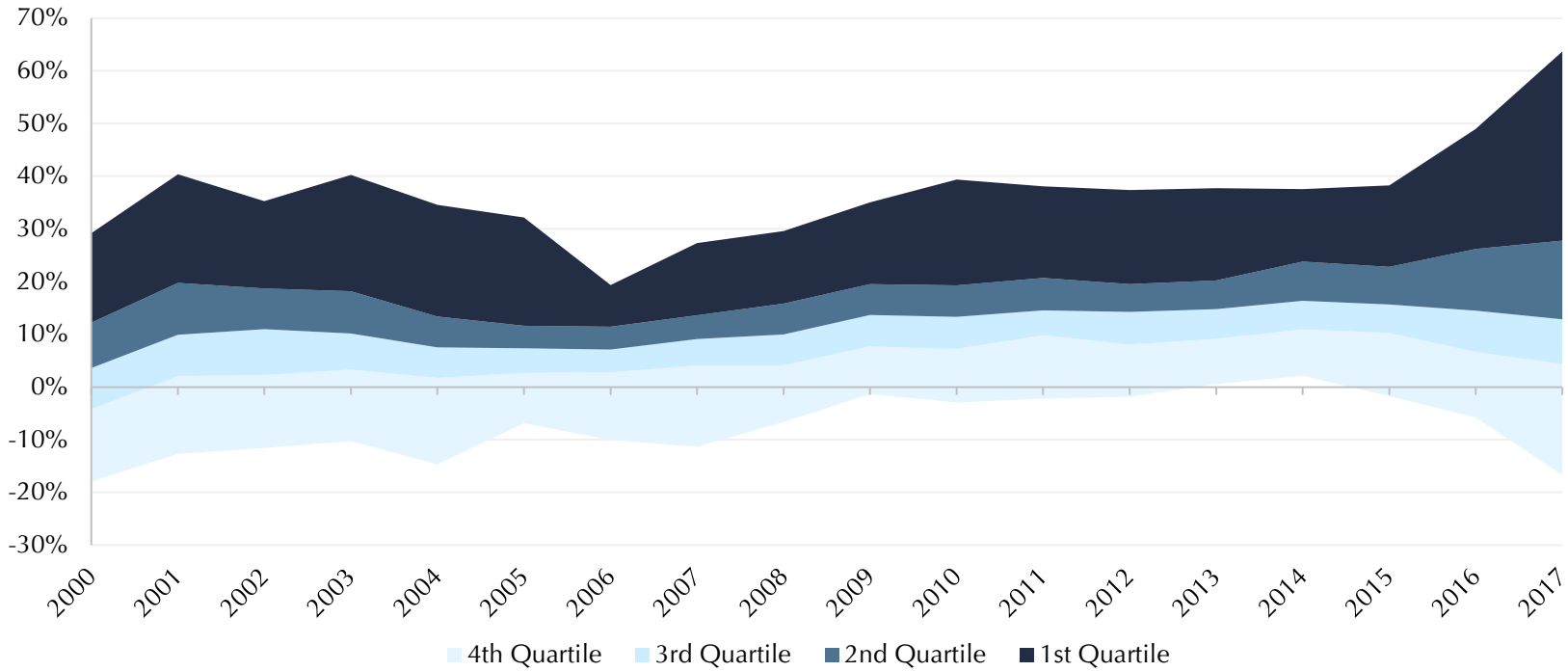
Manager Selection in Private Equity

Manager Selection is Critical

Private Equity Performance by Vintage Year and Quartile



Source: Cambridge Associates Vintage Year Returns (Buyout, Fund of Funds, Growth Equity, Secondary Funds, Venture Capital). Excludes the top 5% and bottom 5% of returns in each vintage year due to scale distortion.
Note: Recent vintage years have been excluded due to performance not yet being meaningful.

Notes:

- Return variance – the difference between the highest return and the lowest - is larger across private equity than many other asset classes. Manager selection is critical for achieving top performance.
- As of June 30, 2019, the spread between the top and bottom performance for a given vintage year averaged 44%.

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Investment Research

Some of the Factors Considered in Due Diligence

Strategy	Management	Track Record	Fund Structure
▪ Aksia preferences: o Strategies where value is actively created o Sector-focused expertise ▪ Competitive advantage ▪ Market fundamentals – 5 year outlook for industry concentrations ▪ Historical performance - adherence to strategy	▪ Experience and history of working together ▪ Access to unique deal flow sources ▪ Time and attention – firm resources ▪ Ownership/compensation structure o Reference calls o Industry analysis Deal flow Valuation analysis	▪ Analysis of return drivers (e.g., operating improvements, multiple expansion, leverage) ▪ Performance benchmarking using proprietary techniques and database ▪ Detailed valuation analysis of unrealized investments ▪ Returns across market cycles ▪ Attribution of performance ▪ Relevance to forward strategy	▪ Alignment of interests with LPs o Fee sharing with LPs o Amount of profits from management fees o Return hurdle applied to carried interest o Amount of GP commitment ▪ Conflicts of interest ▪ Appropriate fund size ▪ Investment guidelines

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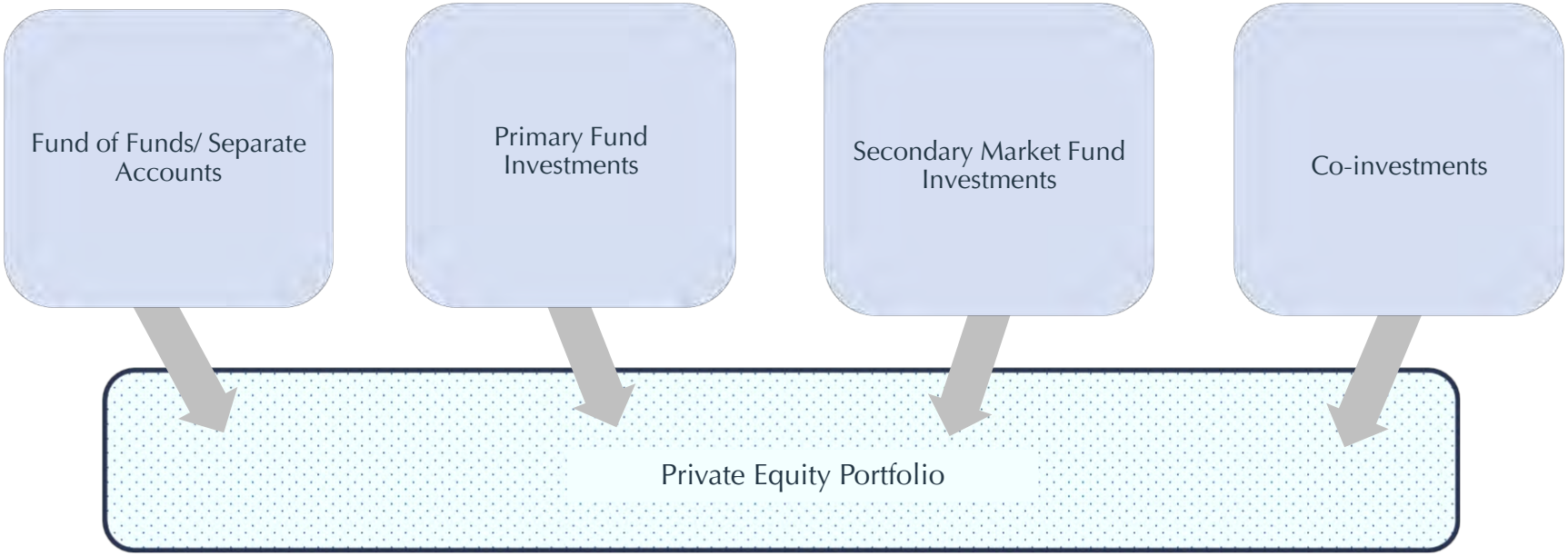
Investment Vehicles and the Secondary Market

Investments Providing PE Exposure

The Most Common Methods of Investing in Private Equity

- There are a variety of ways to gain exposure to private equity, all requiring varying degrees of oversight



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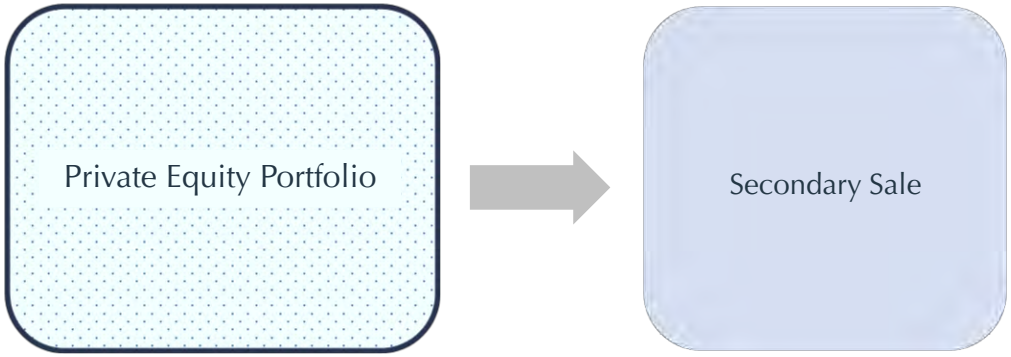
Secondary Market

Investors Can Reduce their Exposure through a Secondary Sale

- The secondary market for selling private equity assets has expanded significantly over the past decade.
- The sales process typically takes between six and twelve months, and assets are usually sold at a discount to present value.



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Summary

Summary

- Private equity's primary purpose is to enhance returns (add alpha)
- A strong private equity program needs to be diversified by vintage year, sub-strategy, industry, and geography.
- Portfolio construction should be tailored for risk, reward, and liquidity needs.
- Extensive due diligence is conducted to evaluate managers, with the ultimate goal of partnering with leading private equity firms
- When executed properly, co-investments provide increased returns without taking on meaningful additional risks.
- The secondary market is a useful tool for rebalancing the portfolio as well as generating unique returns
- Manager selection and building an appropriately-diversified portfolio are critical elements to successfully investing in the asset class

When executed properly, private equity investing can enhance a portfolio by providing attractive risk-adjusted returns and increasing overall stability.

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WILSHIRE ASSOCIATES

Wilshire Consulting

Private Markets Strategic Role and Benchmarking

Thomas Toth, CFA Managing Director

August 2020

PRIVATE MARKETS

Wilshire

PRIVATE ASSETS	VS.	PUBLIC ASSETS
• Opportunity set exists across equity, credit, and real assets		• Opportunity set exists cross equity, credit, and real assets
• Illiquid		• Liquid
• Higher expected returns vs. public markets		• Lower expected returns vs. private markets
• Higher expected risk		• Lower expected risk
• Lower realized risk due to valuation smoothing		• Higher realized risk due to continuous valuations
• More costly to implement		• Efficient to implement
• Larger dispersion of returns		• Generally tighter dispersion of returns

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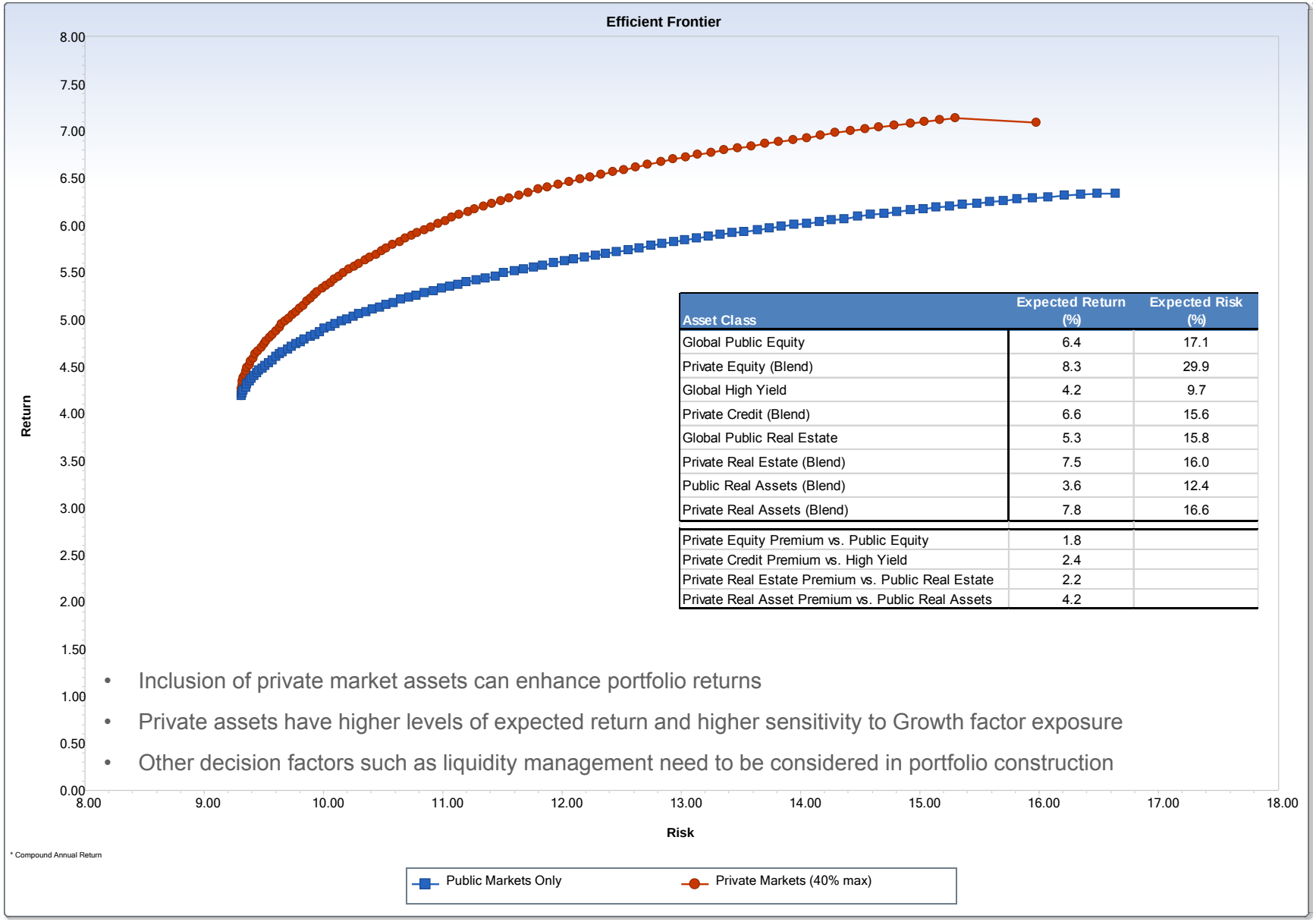
PORTFOLIO CONSTRUCTION



Asset Class	Expected Return (%)	Expected Risk (%)
Global Public Equity	6.4	17.1
Private Equity (Blend)	8.3	29.9
Global High Yield	4.2	9.7
Private Credit (Blend)	6.6	15.6
Global Public Real Estate	5.3	15.8
Private Real Estate (Blend)	7.5	16.0
Public Real Assets (Blend)	3.6	12.4
Private Real Assets (Blend)	7.8	16.6
Private Equity Premium vs. Public Equity	1.8	
Private Credit Premium vs. High Yield	2.4	
Private Real Estate Premium vs. Public Real Estate	2.2	
Private Real Asset Premium vs. Public Real Assets	4.2	

- Inclusion of private market assets can enhance portfolio returns
- Private assets have higher levels of expected return and higher sensitivity to Growth factor exposure
- Other decision factors such as liquidity management need to be considered in portfolio construction

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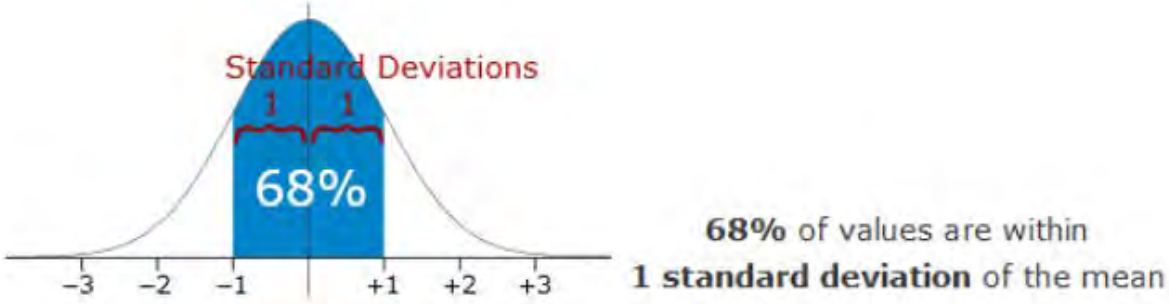
TRACKING ERROR DEFINED

Tracking Error Refresh:

1. Measures how similar or different a portfolio is relative to the stated benchmark – i.e. a level of Active Risk
2. Defined as the standard deviation of the outperformance / underperformance of the portfolio verse the benchmark
3. Active Risk Budget expressed as a target level of tracking error
   - Used as a way to provide a threshold for how much deviation from the benchmark the Investment Committee is comfortable taking in pursuit of alpha (returns over an above the benchmark)
4. Use to evaluate active decisions made by Staff and managers

Example: If active risk budget is set at 1%, then the Investment Committee is stating they are comfortable with staff taking *different* risks vs. the benchmark and portfolio excess return will be +/- 1%, 68% of the time.



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BENCHMARKING

- Benchmarking private assets is not as straightforward as public assets
  - Valuation and pricing of private assets occurs quarterly vs. daily for public assets
  - Valuation availability lags that of public assets, typically by at least one quarter, due to the time it takes to compile and translate financial statement information into an estimate of fair market value
  - Available private asset “benchmarks” from multiple providers are actually universe comparisons, either of private market funds or other plan sponsor private programs
    - Not investable in the same manner as public indexes
    - Underlying constituents can shift depending data availability
    - Quarterly availability lacks monthly granularity

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POSSIBLE ALTERNATIVES

Define the Active Risk Budget such that the benchmark challenges of private assets do not impair Staff ability to manage active risk in the rest of the portfolio:

1. Actionable Tracking Error target – Calculate and budget risk for actionable assets (excluding private assets)
   - Actionable assets are those with a reasonable level of liquidity and implementation vehicles that are not drawdown structures
   - Still important to evaluate privates assets and maintain accountability for strong manager selection
     - Monitor private assets relative to available benchmark options and other performance metrics in isolation
2. Use forward looking estimates of tracking error for purposes of evaluating compliance with Board approved active risk budget
   - This avoids the “noise” of tracking error discussed from rolling up into the total Tracking Error

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APPENDIX

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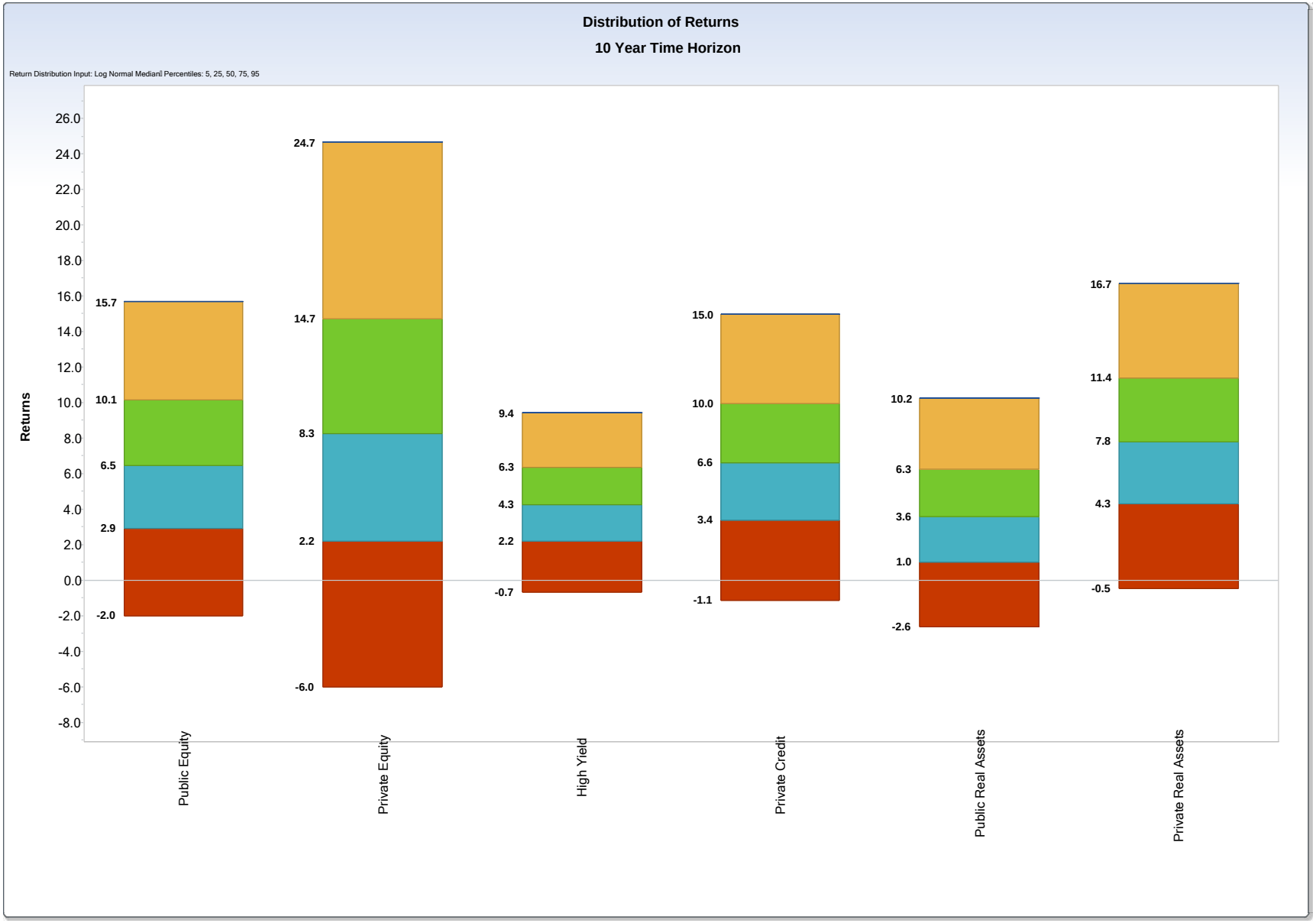
RETURN DISTRIBUTION



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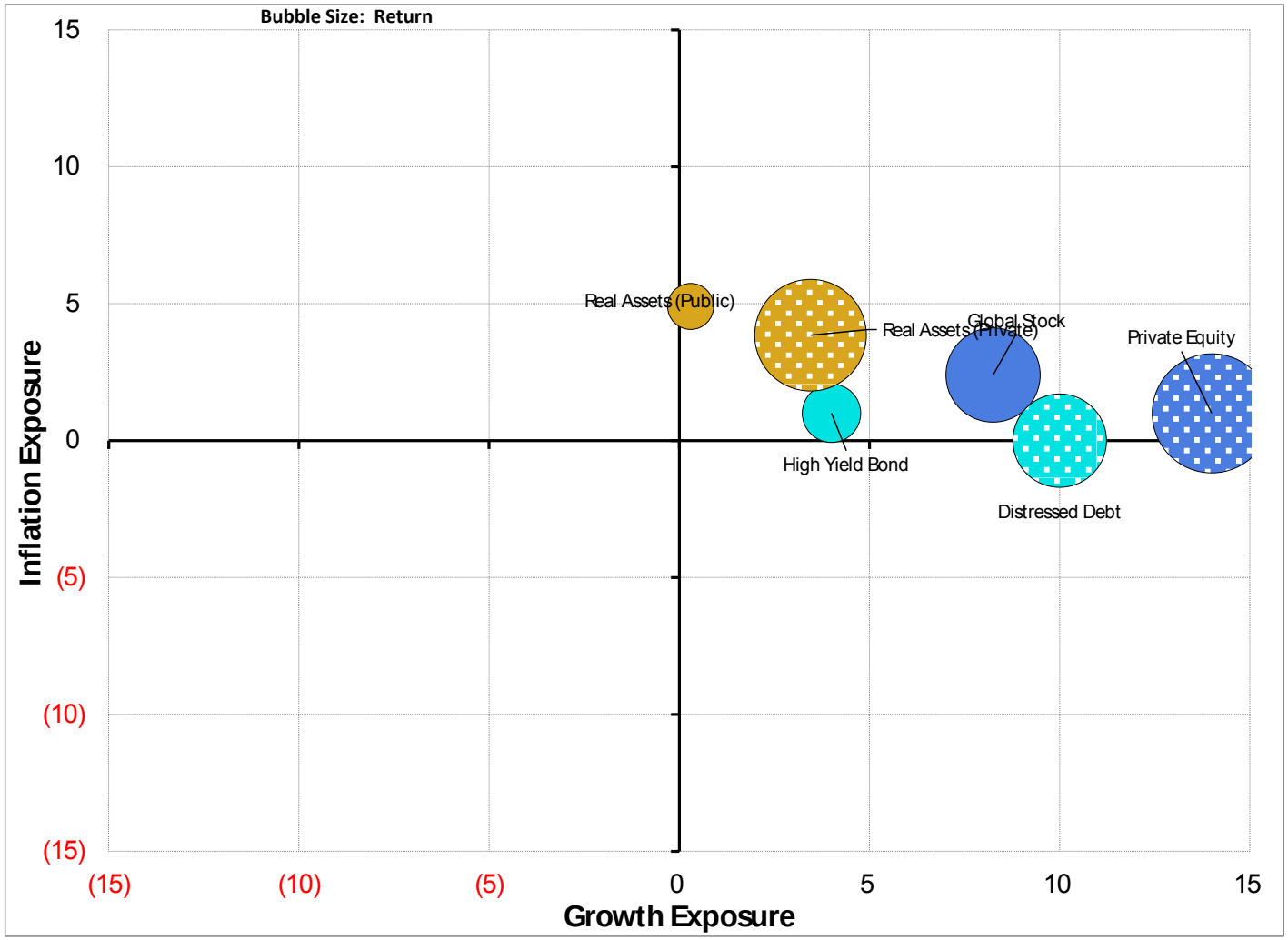
FACTOR EXPOSURES



- Private assets have higher levels of expected return and higher sensitivity to Growth factor exposure

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BENCHMARKING EFFECTS ON ACTIVE RISK

Due to the challenges of private markets benchmarking, the calculated tracking error contribution is materially impacted:

- Policy benchmark contains indexes which are comprised of liquid instruments
- Actual private portfolios have high tracking error (12-20%) vs benchmark
- Correlations of realized excess returns are "noisy"

The three areas above are obstacles that Staff has little control over in terms of managing the actual private portfolios but it "consumes" a majority of the active risk

		TE Contribution	
	Individual Tracking Error	Scenario 1	Scenario 2
Public Assets TE	1%	0.03%	0.02%
Private Equity TE	14%	0.96%	1.55%
Real Assets TE	4.3%	0.28%	0.20%
Allocation Mgmt	n/a	0.02%	0.02%
Total TE		1.29%	1.79%

Hypothetical Total Fund Risk Budget: 1.5%

Scenario 1: Staff has implemented strategic asset allocation and Private Equity weight matches weight in policy, TE is within budget but PE risk verse benchmark is consuming 74% of the 150 bps limit.

Scenario 2: Board decides to increase allocation to Private Equity. Without any changes in active management the TE increases to 180 bps

Analysis: The active risk budget limits what staff can implement within public assets, and also poses a constraint on allocating more to Private Equity

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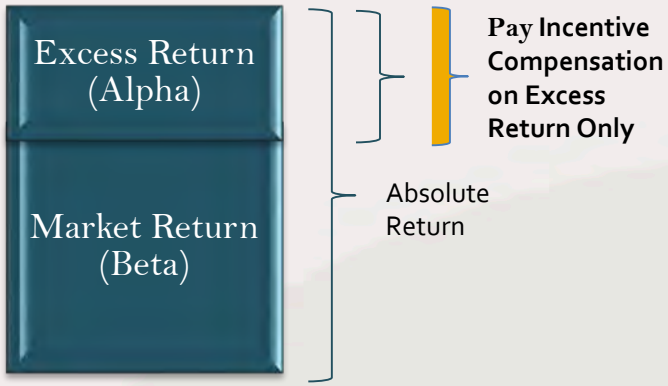
Introducing Excess Value Method (EVM)

25 August 2020

Relative Return vs Absolute Return (hard hurdle vs soft hurdle)

Portable Alpha/HFs



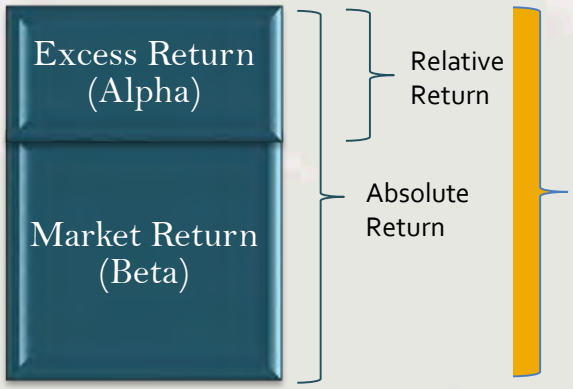
Goal

- Capture 70% of total Value add
- Net Value Add ~3.0% - 3.5%

PERA Solution

- Portable alpha: Bonds+ implementation

Privates



Goal:

- Capture 70% of total Value add
- Net Value Add ~2.5% - 3.0%

PERA Solution

- Excess Value Add Method
- Co-invest

Traditional Private Equity carried interest pays Incentive Compensation on entire Absolute Return after a preferred return is reached (soft hurdle)

Excess Value Method seeks to pay incentive compensation on only the excess return, or only the relative return, or only that return which is above market or systematic returns (hard hurdle)

PERA

Private Market Performance Measures

New Mexico PERA Board Presentation

August 2020

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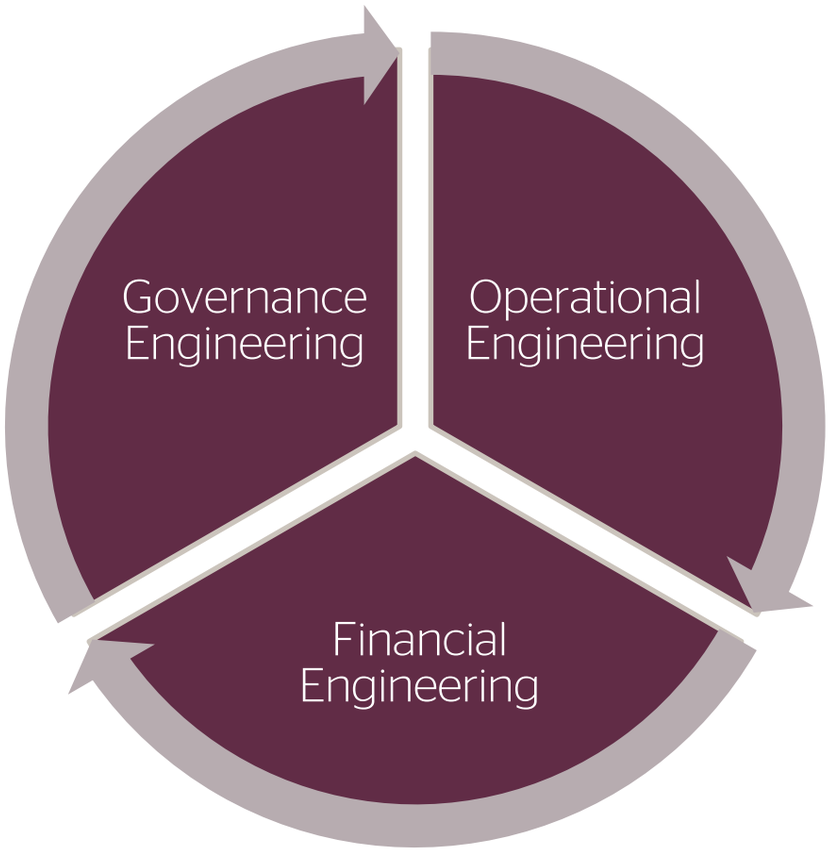
LANDMARK PARTNERS

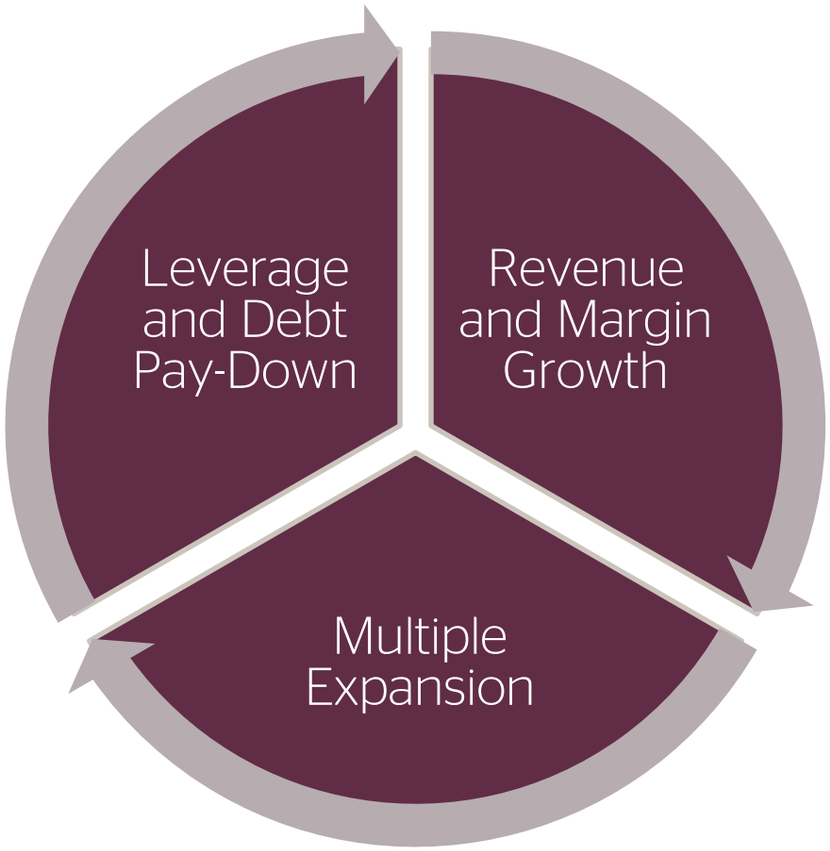
Value Levers and Sources

- Researchers have developed two common typologies to think about the levers that private equity firms can use to create value for their companies. These levers are more readily available via private vs. public markets

Conceptual Model[1]



Mechanical Model[2]



- Under both typologies, value created (or destroyed) can result from both systematic (i.e., market-based) and idiosyncratic (i.e., company, fund or firm-specific) sources[3]

(1) Gompers, Paul, Steven N. Kaplan, and Vladimir Mukharlyamov. "What Do Private Equity Firms Say They Do?." *Journal of Financial Economics* 121.3 (2016): 449-476; Kaplan, Steven N., and Per Stromberg. "Leveraged Buyouts and Private Equity." *Journal of Economic Perspectives* 23.1 (2009): 121-46.

(2) Acharya, Viral V., et al. "Corporate Governance and Value Creation: Evidence from Private Equity." *The Review of Financial Studies* 26.2 (2013): 368-402; Turetsky, Avi I. *Making Heads and Tails of Distributional Patterns: A Value-Creation-Type and Sector-Based Analysis Among Private-Equity-Owned Companies*. Diss. Case Western Reserve University, 2018.

(3) Kaplan, Steven N., and Antoinette Schoar. "Private Equity Performance: Returns, Persistence, and Capital Flows." *The Journal of Finance* 60.4 (2005): 1791-1823.; Gredil, Oleg, Barry E. Griffiths, and Rüdiger Stucke. "Benchmarking Private Equity: The Direct Alpha Method." *Available at SSRN 2403521* (2014); Turetsky, Avi, Matthew Pyrz, Barry Griffiths, Joaquin Lujan, Isaac Beckel. *Calculating Outperformance in Dollars: Introducing the Excess Value Method.* Working Paper. Landmark Partners and NM PERA, 2020.

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Brief History of Performance Measures

- Traditionally, most private equity (and other private market) investors have thought in terms of *absolute* performance measures. In recognition of the need to separate alpha from systematic return sources, more sophisticated practitioners and academics have increasingly moved towards *relative* performance measures,[1,2,3] which our research indicates are more persistent over time[4]

- Direct Alpha was developed in-house at Landmark,[1] and Excess Value[3] was developed in partnership between Landmark and NM PERA

- The relative measures aim to quantify the value created by a private market investment in excess of publicly available return sources

Performance Measures

	Absolute Measure	Relative Measure
Rate	Internal Rate of Return (IRR)	Direct Alpha (DA)[1]
Multiple	Total Value to Paid-In Capital (TVPI)	Kaplan-Schoar Public Market Equivalent (KS-PME)[2]
Dollars	Dollars	Excess Value (EVM)[3]

(1) Gredil, Oleg, Barry E. Griffiths, and Rüdiger Stucke. "Benchmarking Private Equity: The Direct Alpha Method." *Available at SSRN 2403521* (2014).
(2) Kaplan, Steven N., and Antoinette Schoar. "Private Equity Performance: Returns, Persistence, and Capital Flows." *The Journal of Finance* 60.4 (2005): 1791-1823.
(3) Turetsky, Avi, Matthew Pyrz, Barry Griffiths, Joaquin Lujan, Isaac Beckel. *Calculating Outperformance in Dollars: Introducing the Excess Value Method.* Working Paper. Landmark Partners and NM PERA, 2020.
(4) Landmark Internal Research.

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Direct Alpha and KS-PME

- Direct Alpha is a rate measure of relative performance
  - For example, a Direct Alpha of 5% indicates that a private investment generated an annualized return 5% above a public benchmark

- KS-PME is a multiple measure of relative performance
  - For example, a KS-PME of 1.15 indicates that a private investment outperformed the public benchmark by 15% in total. Stated differently, the investor achieved 15% more future-valued or present-valued wealth by choosing the private market investment rather than the benchmark

Direct Alpha and KS-PME

	Outperformed Benchmark	Equal to Benchmark	Underperformed Benchmark
Direct Alpha	Positive	0%	Negative
KS-PME	Greater than 1.0	1.0	Less than 1.0

- Both metrics are consistent with Modern Portfolio Theory. This means they are directly compatible with widely-used portfolio management models and techniques

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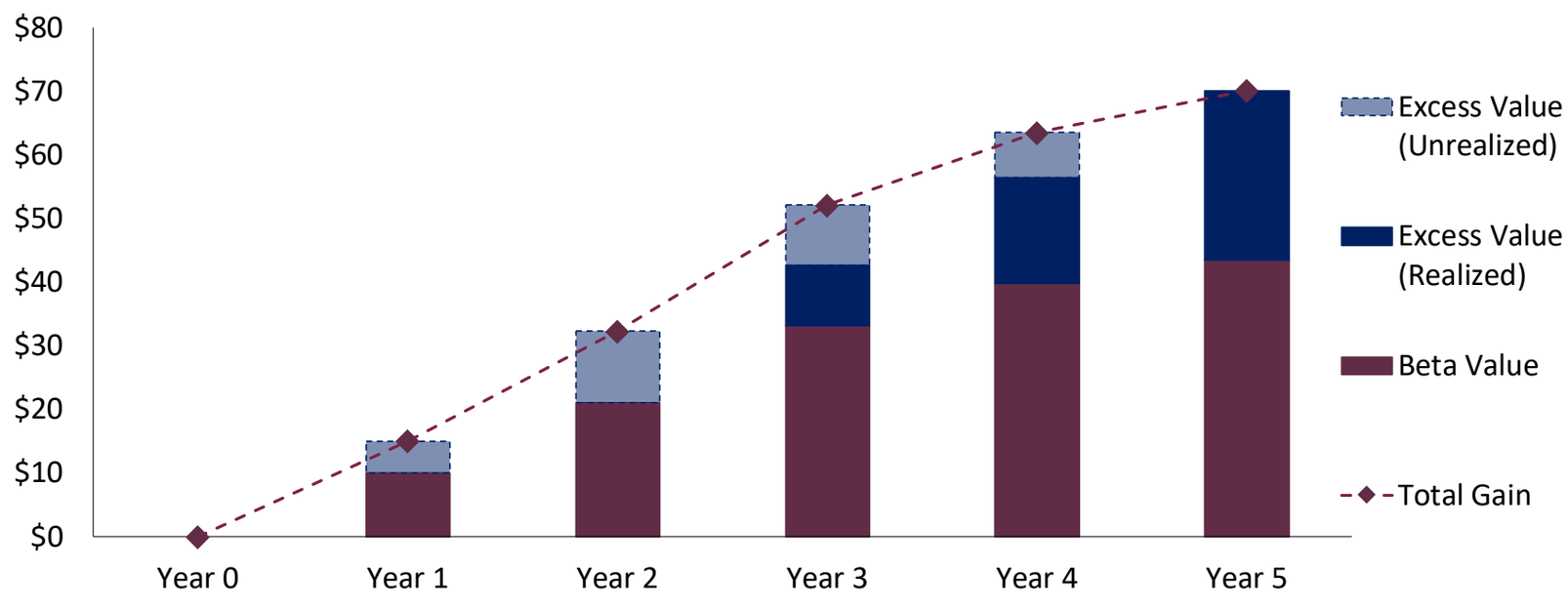
The Excess Value Method (EVM)

- EVM measures the value that a private market investment or portfolio generates above (or below) a benchmark in dollars
    - For example, an Excess Value of $100 indicates that the private investment generated $100 more, in nominal dollars, than an equivalent investment in the benchmark would have
- EVM also disaggregates Total Gain into three sources of return (Alpha Value, Beta Value, Interaction Value) and measures how these components evolve over time
- Developed as a collaboration between NM PERA and Landmark Partners



Hypothetical, only for illustrative purposes. There can be no assurance that investments will be profitable or provide a return of invested capital.

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Components of Excess Value

Excess Value can be separated into the following three components, which together equal total Excess Value:

- **Alpha Value** – The present value at inception, in dollars, of the outperformance that an investment will create. Stated differently, Alpha Value represents the value to an investor of the investment at Time Zero

- **Beta Value** – The value, again in dollars, that the investor could have achieved by investing in the public market benchmark instead of the private market investment

- **Interaction Value** – The value, again in dollars, that is created because the Alpha Value grows at the benchmark rate. In other words, Interaction Value forms through the interaction of Alpha Value and Beta Value

It can also be divided into realized and unrealized pieces:

- **Realized Excess Value** – The portion of Excess Value that is attributable to distributions, or capital no longer at risk

- **Unrealized Excess Value** – The portion of Excess Value that is attributable to remaining NAV, or capital still at risk

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EVM Use Cases

Performance Assessment Tool

EVM can answer many important questions investors may have around portfolio analytics and manager diligence:

- How many dollars did a manager or investment generate relative to a benchmark?
- How successful has an LP's total private market program been in creating value relative to a benchmark? How many more dollars has the program generated than the benchmark?
- When was this Excess Value created and how did these amounts evolve over time?

Compensation Programs

As an alternative to traditional carried interest, EVM-based compensation structures would base incentive payments on outperformance relative to a benchmark rather than absolute returns:

- EVM-based compensation could better align compensation with performance objectives by incenting managers specifically to outperform their public factor exposures
- Investors would avoid paying high fees for the component of returns that can be achieved more cheaply in the public markets

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Summary

- Private equity (and other private market) investors have a variety of value creation levers at their disposal. These levers are generally more readily accessible in private markets vs. public markets

- Traditionally, private market investors have primarily used absolute performance measures, most notably IRRs and TVPIs

- In recognition of the need to separate out systematic (i.e., market-based) sources of return from idiosyncratic (e.g., company, fund, or manager-specific) sources, more sophisticated practitioners and academics have increasingly moved towards relative performance measures, which evidence indicates are more persistent over time. Most notable among these are Direct Alpha, KS-PME, and now Excess Value
    - Direct Alpha measures the performance of a private market investment vs. a public market benchmark as an annualized rate (e.g., 5%)
    - KS-PME measures this relative performance as a multiple (e.g., 1.15x)
    - Excess Value, developed jointly by Landmark and NM PERA, measures this relative performance in dollars (e.g., $100 million)

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Alpha is defined as the return related to management or investment selection skills not attributable to market (systematic) or specific (company- or industry-related) return factors. Barry Griffiths, Ph.D., CFA®, Partner, Head of Quantitative Research, Landmark Partners, has developed an algorithm for calculating alpha based on the inputs from a comparable basket of benchmark indices and underlying private equity portfolio companies' cash flows. This algorithm is referred to as "Direct Alpha." For more details on this method, see "Estimating alpha in private equity" by Barry Griffiths, Private Equity Mathematics, PEI Media, March 2009; or "Benchmarking Private Equity: The Direct Alpha Method," Gredil, Griffiths, and Stucke, 2014 (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2403521).

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Excess Value Method in Practice

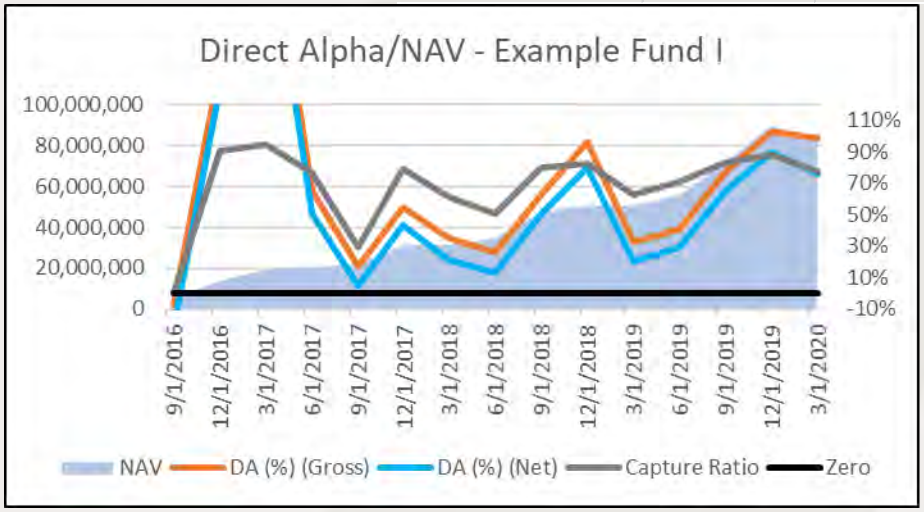
25 August 2020

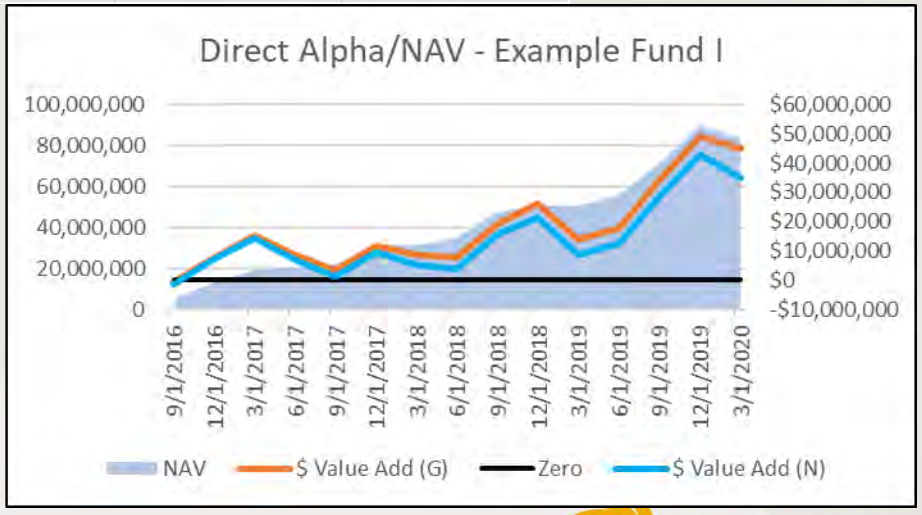
Excess Value Analysis – In Practice

With use of subscription lending

- We can analyze both IRR and Excess Value and answer the questions: a) how many $'s the manager has generated in excess value, and b) how much of that is retained by PERA vs. given back to the GP in fees

	IRR	Direct Alpha - MSCI ACWI IMI		
Example Fund I		Cumulative	Annualized	Excess Value $
Gross	41.2%	98.4%	31.0%	$44,912,762
Net	26.5%	76.2%	25.0%	$34,783,555
Capture Ratio	**64.5%**	**77.4%**	**80.7%**	**77.4%**
			Weighted Average Life	**2.5**
			Actual Life	**3.5**





- Based on hypothetical $100M commitment

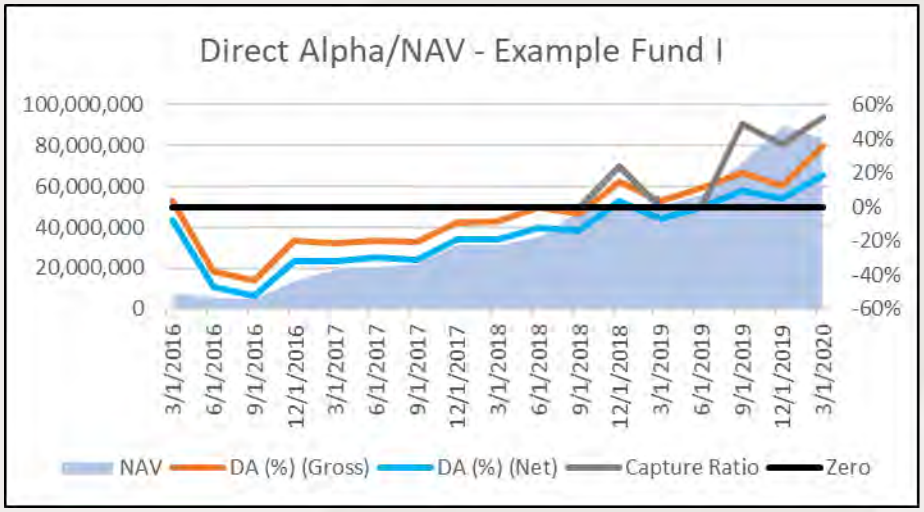
PERA

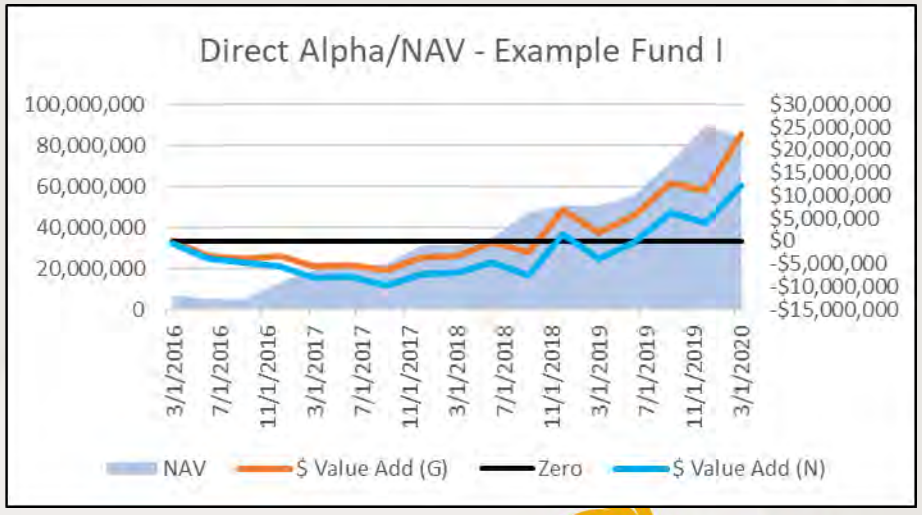
Excess Value Analysis – In Practice

Without subscription lending

- We can better understand the impacts of subscription line leverage on reported returns. In this example, the fund would report an IRR of 26.5% net (previous page), but in fact much of that was driven from the use of subscription leverage, as actual IRR would have been 3.8% net (this page)
- In this example, the 52% capture ratio of excess value is well below our target of 70%

	IRR	Direct Alpha - MSCI ACWI IMI		
Example Fund I		**Cumulative**	**Annualized**	**Excess Value $**
Gross	12.5%	35.6%	11.0%	$23,617,483
Net	3.8%	18.6%	6.0%	$12,334,022
Capture Ratio	**30.5%**	**52.2%**		**52.2%**
			Weighted Average Life	**2.9**
			Actual Life	**4.0**





PERA

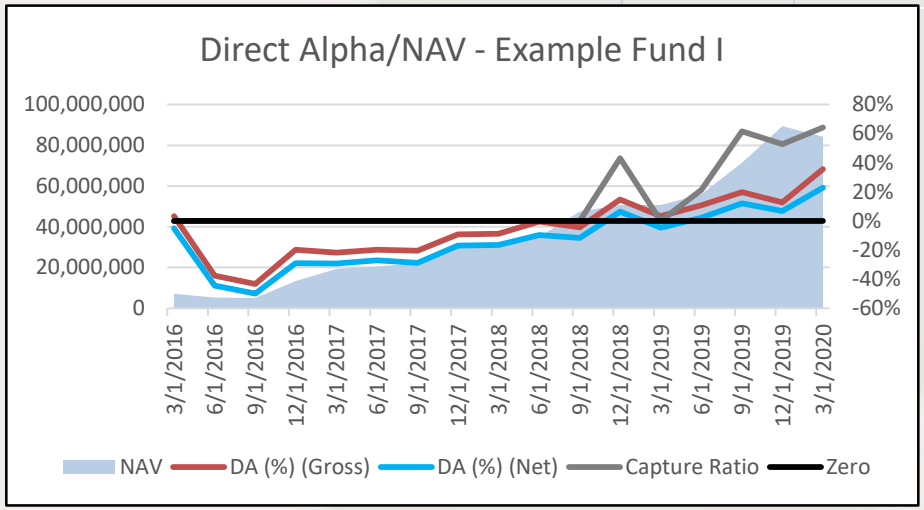
- Based on hypothetical $100M commitment

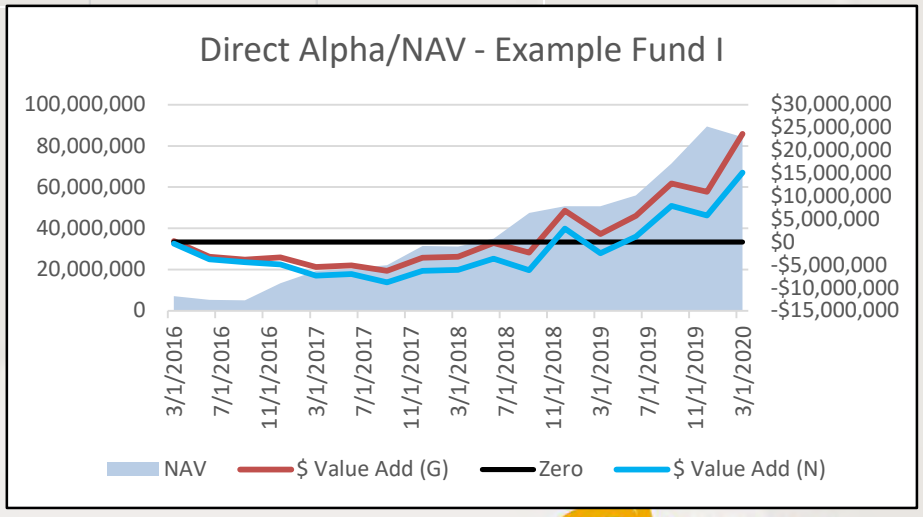
Excess Value Analysis – In Practice

With Co-Invest

- We can improve alignment with a better structure. In this example, by adding a 25% co-invest, our alpha capture would have increased from 52.2% to 64.2% for this fund. Or from a $ perspective, PERA would have retained over $15M in excess value vs. $12.3M by allocating 25% of $100M commitment to co-invest.

	IRR	Direct Alpha - MSCI ACWI IMI		
Example Fund I		**Cumulative**	**Annualized**	**Excess Value $**
Gross	12.5%	35.6%	11.0%	$23,617,483
Net	5.7%	22.8%	7.3%	$15,154,887
Capture Ratio	**45.9%**	**64.2%**		**64.2%**
			Weighted Average Life	**2.9**
			Actual Life	**4.0**





- Based on hypothetical $100M commitment

*Co-invest assumes same performance, but lowers fees by 25% (75% allocation to main fund/25% allocation to Co-invest with no management fee or carry)

PERA

Chief Investment Officer's Update

August 25, 2020

Dominic Garcia,
Chief Investment Officer

Investment Governance: Decision Waterfall

Decision #1: Board sets long-term risk tolerance and target returns to meet funding goals to be achieved over 10 years or longer.

Decision #2: Board sets strategic asset allocation (Policy Portfolio) and benchmarks to meet goals over 10 years or longer.

A. Policy Portfolio Benchmark
B. Reference Portfolio Benchmark

Decision #3: Board delegates implementation of Policy Portfolio to Staff, with assistance of selection consultants.

Decision #4: Board delegates to Staff additional risk (Active Risk) beyond the Policy Portfolio to produce value add. The Active Risk Budget is the governing tool.

A. Additional Risk Budget:	1.5% +/- 0.5% band
B. Target Additional Return:	1.0%

PERA

Key Next Steps

Education Sessions (TBD)

- Big Picture: Next 10-year investment horizon.
- Role of Strategic Asset Allocation
- Does risk balance allocations make sense post-COVID-19?
    - Review Multi Risk
- How to make income and risk mitigating strategies work harder
    - Review Risk Mitigation

Potential Key Action Items (November)

- Strategic Asset Allocation Recommended Enhancements
- Benchmarking Updates

Work Plan (November)

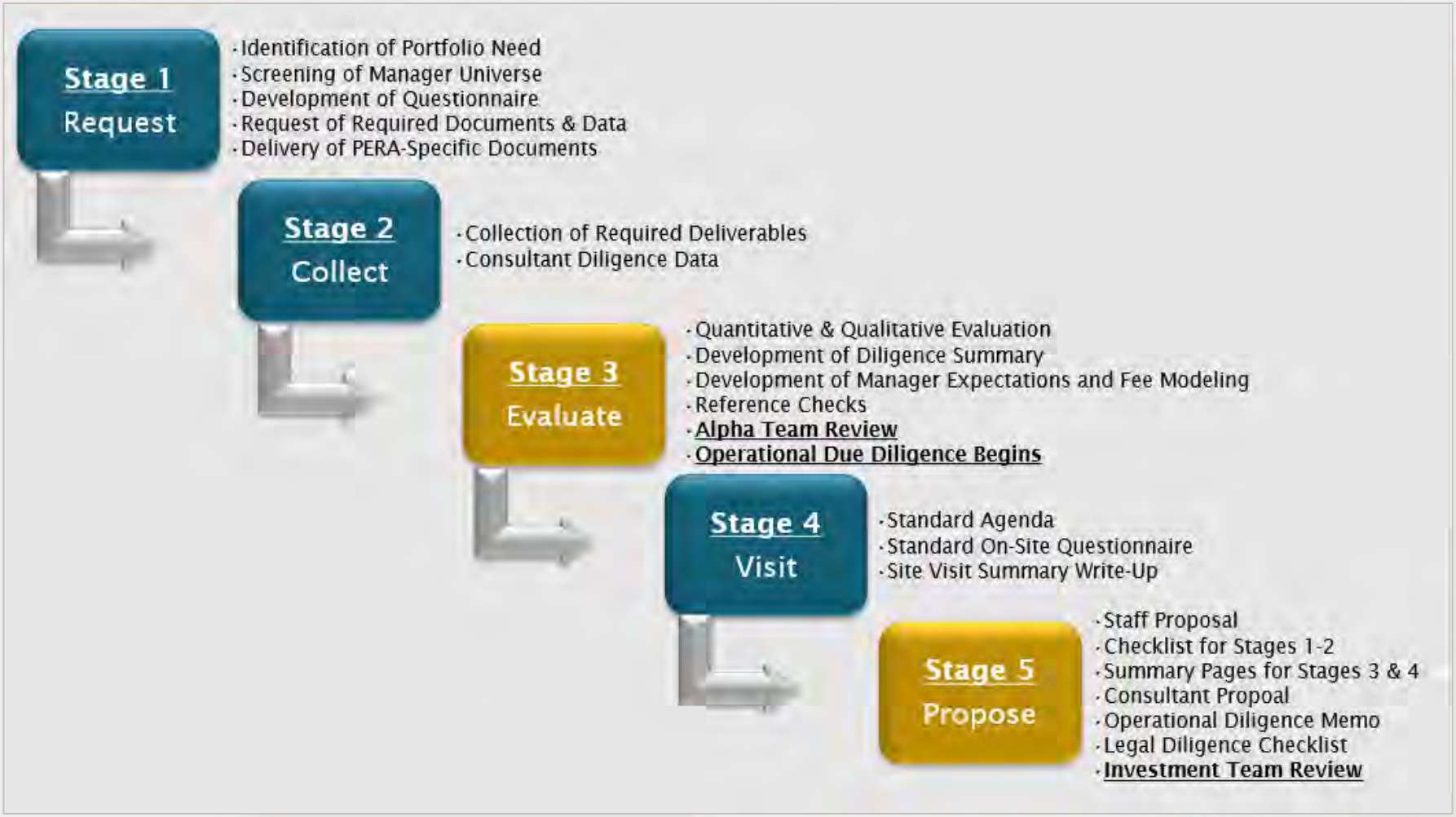
- Real Asset Asset Review
- Reference Portfolio Review

PERA

Manager Selection Activity Report

August 25, 2020

Overview: Manager Selection Process



PERA

Manager Selection Pipeline

Liquid	Allocation	Commitment	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Expiration of MacKay Shields Summary: Allocation to BlackRock Domestic Core	Risk Mitigation	$202m	Completed	Completed	Completed	Completed	Completed

Illiquid	Allocation	Commitment	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Single-Family Rental Summary: Private Value-Add Real Estate (New Mandate)	Real Assets	-	In Process				
Starwood XII Summary: Opportunistic Real Estate (Follow On)	Real Assets	-	Completed	Completed	In Process		
TCV XI Summary: Venture(Follow-On Investment)	Global Equity	-	Completed	Completed	Completed	In Process	
Montagu VI – Co-Invest Summary: Private Equity (Follow-On Investment)	Global Equity	-	Completed	Completed	Completed	In Process	
Tenex Capital Partners III/ White Sands Co-Invest Summary: Private Equity (New Mandate)	Global Equity	$45/20m	Completed	Completed	Completed	Completed	Completed
The Resolute Fund V Summary: Private Equity (Follow-On Investment)	Global Equity	$75m	Completed	Completed	Completed	Completed	Completed

Other	Allocation	Commitment	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Albourne ODD Services Summary: Liquid manager operational due diligence	N/A	N/A	Completed	Completed	Completed	Completed	Completed

Note: All completed opportunities are subject to satisfactory legal review, prior to final execution.

PERA

Manager Selection Pipeline

Bonds Plus Alpha	Commitment	Allocation	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Alphadyne International Fund Summary: Directional (New Mandate)	-	Risk Reduction	In Process				
Two Sigma Absolute Return Summary: Relative Value (New Mandate)	-	Risk Reduction	In Process				
DE Shaw Multi-Asset Fund Summary: Relative Value(New Mandate)	-	Risk Reduction	In Process				
Millennium Partners Summary: Multi-Strategy (New Mandate)	-	Risk Reduction	Completed	Completed	Completed	In Process	
Marshall Wace Summary: Multi-strategy Equity L/S (New Mandate	$50m	Risk Reduction	Completed	Completed	Completed	Completed	Completed
Garda Fixed Income Relative Value Summary: Relative Value (New Mandate)	$50m	Risk Reduction	Completed	Completed	Completed	Completed	Completed

Note: All completed opportunities are subject to satisfactory legal review, prior to final execution.

PERA

NM Public Employees Retirement Association
Cash Flow Projection - FY 20

	Actuals												Month's Activity
	July	August	September	October	November	December	January	February	March	April	May	June	
Month Beginning Cash, BNYM	$42	$24	$33	$43	$52	$28	$47	$34	$23	$130	$51	$23	
Uses of Cash													
Asset Class Purchases													
Liquid Asset Purchases	265	100	100	253	512	1,262	100	100	285	0	0	0	
Illiquid Asset Capital Calls	59	84	43	69	72	100	11	26	57	163	32	83	
Illiquid Asset Purchases	0	0	0	0	0	0	0	0	0	0	134	265	Bonds + Activity: Alpha Increase $265m
Total Benefit Payments	105	105	105	106	106	106	107	107	107	107	107	107	
Benefit Payments (BNYM)	53	57	49	53	69	57	48	63	53	47	60	58	
Benefit Payments (STO)	52	48	56	53	37	49	59	44	54	60	47	49	
Refunds	4	4	5	6	4	4	3	5	3	3	2	2	
Operational Expense	1	1	1	1	5	1	2	5	1	2	4	2	
Other	0	0	0	0	0	0	0	0	0	0	0	0	
Sources of Cash													
Asset Class Sales													
Liquid Asset Redemptions	305	195	165	318	572	1,399	100	135	480	115	120	362	Bonds+ Activity: Collateral Cash $131, Credit Liquidity: $134 Rebal: Global Equity Liquidity $97m
Illiquid Asset Distributions	49	56	36	59	52	38	25	43	20	16	14	49	Private Asset Distributions
Illiquid Asset Redemptions	2		0	1	0	0	0	0	0	0	54	0	
Employee / Employer Contributions	51	67	56	55	52	53	73	53	55	55	50	53	
Other	2	0	0	6	4	1	21	0	1	0	10	3	Suspense Account / Corporate Action / Overlay
Month Ending Cash, BNYM	24	33	43	52	28	47	34	23	130	51	23	31	
Corporate Action/Suspense	3	3	3	3	3	3	1	1	1	9	4	1	
Month Ending Cash, STO	22	36	30	25	30	30	40	39	36	25	22	22	
Month-End Capital Allocations													
Global Equity	6,476	6,382	6,338	6,363	6,317	6,276	6,132	5,639	5,109	5,430	5,500	5,504	
Risk Reduction & Mitigation	3,349	3,307	3,299	3,291	3,240	3,226	3,257	3,283	2,884	2,816	2,823	2,857	
Credit Oriented Fixed Income	2,286	2,298	2,293	2,251	2,240	2,248	2,263	2,263	2,152	2,046	2,060	2,090	
Real Assets	3,112	3,129	3,128	3,147	3,132	3,189	3,160	3,095	2,850	2,973	2,941	2,954	
Multi-Risk Allocation	421	539	639	760	890	1,074	1,190	1,254	1,263	1,301	1,334	1,365	
STO Cash	22	36	30	25	30	30	40	39	36	25	22	22	
Total (net of cash flows)	$15,666	$15,691	$15,727	$15,836	$15,851	$16,043	$16,043	$15,575	$14,295	$14,592	$14,681	$14,792	
Month-End Percentage Allocations													
Fund Balance (less STO)	$15,644	$15,655	$15,697	$15,812	$15,820	$16,014	$16,003	$15,535	$14,259	$14,567	$14,659	$14,770	
Global Equity	41.4%	40.8%	40.4%	40.2%	39.9%	39.2%	38.3%	36.3%	35.8%	37.3%	37.5%	37.3%	
Risk Reduction & Mitigation	21.4%	21.1%	21.0%	20.8%	20.5%	20.1%	20.4%	21.1%	20.2%	19.3%	19.3%	19.3%	
Credit Oriented Fixed Income	14.6%	14.7%	14.6%	14.2%	14.2%	14.0%	14.1%	14.6%	15.1%	14.0%	14.1%	14.1%	
Real Assets	19.9%	20.0%	19.9%	19.9%	19.8%	19.9%	19.7%	19.9%	20.0%	20.4%	20.1%	20.0%	
Multi-Risk Allocation	2.7%	3.4%	4.1%	4.8%	5.6%	6.7%	7.4%	8.1%	8.9%	8.9%	9.1%	9.2%	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

June Change in Value	Current Month's Weights			
	Actual	Target	Var.	Range
4	37.2%	35.5%	1.7%	+/-5%
34	19.3%	19.5%	-0.2%	+/-3%
29	14.1%	15.0%	-0.9%	+/-4%
13	20.0%	20.0%	0.0%	+/-4%
31	9.2%	10.0%	-0.8%	+/-4%
(0)	0.1%	0.0%	0.1%	
111	100.0%	100.0%		

Tier	Liquidity Summary	
	$ Allocation	% Allocation
Tier 1 (1-5 days)	$ 2,795,986,890	19%
Tier 2 (5-90 days)	$ 7,406,971,729	50%
Tier 3 (90-365 days)	$ 523,120,863	4%
Tier 4 (1 year +)	$ 4,043,915,185	27%

NM Public Employees Retirement Association
Cash Flow Projection - FY 20

	Actuals											Estimate	Month's Activity
	July	August	September	October	November	December	January	February	March	April	May	June	
Month Beginning Cash, BNYM	$42	$24	$33	$43	$52	$28	$47	$34	$23	$130	$51	$23	
Uses of Cash													
Asset Class Purchases													
Liquid Asset Purchases	265	100	100	253	512	1,262	100	100	285	0	0	0	
Illiquid Asset Capital Calls	59	84	43	69	72	100	11	26	57	163	32	80	
Illiquid Asset Purchases	0	0	0	0	0	0	0	0	0	0	134	0	Bonds + Activity: Collateral Cash $134m
Total Benefit Payments	105	105	105	106	106	106	107	107	107	107	107	105	
Benefit Payments (BNYM)	53	57	49	53	69	57	48	63	53	47	60	60	
Benefit Payments (STO)	52	48	56	53	37	49	59	44	54	60	47	45	
Refunds	4	4	5	6	4	4	3	5	3	3	2	4	
Operational Expense	1	1	1	1	5	1	2	5	1	2	4	2	
Other	0	0	0	0	0	0	0	0	0	0	0	0	
Sources of Cash													
Asset Class Sales													
Liquid Asset Redemptions	305	195	165	318	572	1,399	100	135	480	115	120	80	Bonds+ Activity: Core Bond Redemption $80m Rebal: Global Equity Liquidity $40m
Illiquid Asset Distributions	49	56	36	59	52	38	25	43	20	16	14	50	Private Asset Distributions
Illiquid Asset Redemptions	2		0	1	0	0	0	0	0	0	54	0	Bonds+ Activity: Alpha Redemption $54m Hedge Fund/Portable Alpha Residuals
Employee / Employer Contributions	51	67	56	55	52	53	73	53	55	55	50	50	
Other	2	0	0	6	4	1	21	0	1	0	10	1	Suspense Account / Corporate Action / Overlay
Month Ending Cash, BNYM	24	33	43	52	28	47	34	23	130	51	23	14	
Corporate Action/Suspense	3	3	3	3	3	3	1	1	1	9	4	4	
Month Ending Cash, STO	22	36	30	25	30	30	40	39	36	25	22	20	
Month-End Capital Allocations													
Global Equity	6,476	6,382	6,338	6,363	6,317	6,276	6,132	5,639	5,109	5,430	5,500	5,167	
Risk Reduction & Mitigation	3,349	3,307	3,299	3,291	3,240	3,226	3,257	3,283	2,884	2,816	2,823	2,838	
Credit Oriented Fixed Income	2,286	2,298	2,293	2,251	2,240	2,248	2,263	2,263	2,152	2,046	2,060	2,183	
Real Assets	3,112	3,129	3,128	3,147	3,132	3,189	3,160	3,095	2,850	2,973	2,941	2,911	
Multi-Risk Allocation	421	539	639	760	890	1,074	1,190	1,254	1,263	1,301	1,334	1,456	
STO Cash	22	36	30	25	30	30	40	39	36	25	22	20	
Total (net of cash flows)	$15,666	$15,691	$15,727	$15,836	$15,851	$16,043	$16,043	$15,575	$14,295	$14,592	$14,681	$14,576	
Month-End Percentage Allocations													
Fund Balance (less STO)	$15,644	$15,655	$15,697	$15,812	$15,820	$16,014	$16,003	$15,535	$14,259	$14,567	$14,659	$14,556	
Global Equity	41.4%	40.8%	40.4%	40.2%	39.9%	39.2%	38.3%	36.3%	35.8%	37.3%	37.5%	35.5%	
Risk Reduction & Mitigation	21.4%	21.1%	21.0%	20.8%	20.5%	20.1%	20.4%	21.1%	20.2%	19.3%	19.3%	19.5%	
Credit Oriented Fixed Income	14.6%	14.7%	14.6%	14.2%	14.2%	14.0%	14.1%	14.6%	15.1%	14.0%	14.1%	15.0%	
Real Assets	19.9%	20.0%	19.9%	19.9%	19.8%	19.9%	19.7%	19.9%	20.0%	20.4%	20.1%	20.0%	
Multi-Risk Allocation	2.7%	3.4%	4.1%	4.8%	5.6%	6.7%	7.4%	8.1%	8.9%	8.9%	9.1%	10.0%	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

May Change in Value	Current Month's Weights Actual	Target	Var.	Range
70	37.5%	35.5%	2.0%	+/-5%
7	19.2%	19.5%	-0.3%	+/-3%
14	14.0%	15.0%	-1.0%	+/-4%
(32)	20.0%	20.0%	0.0%	+/-4%
33	9.1%	10.0%	-0.9%	+/-4%
(3)	0.2%	0.0%	0.2%	
89	100.0%	100.0%		

Tier	Liquidity Summary $ Allocation	% Allocation
Tier 1 (1-5 days)	$ 2,910,257,014	20%
Tier 2 (5-90 days)	$ 7,389,872,754	50%
Tier 3 (90-365 days)	$ 374,563,119	3%
Tier 4 (1 year +)	$ 3,984,267,334	27%

NM Public Employees Retirement Association
Cash Flow Projection - FY 20

	Actuals										Estimate		Month's Activity
	July	August	September	October	November	December	January	February	March	April	May	June	
Month Beginning Cash, BNYM	$42	$24	$33	$43	$52	$28	$47	$34	$23	$130	$51	$52	
Uses of Cash													
Illiquid Asset Capital Calls													
PE, RE, RA, Credit	59	84	43	69	72	100	11	26	57	163	80	80	Private Asset Drawdowns
Asset Class Purchases													
Liquid Asset Purchases	265	100	100	253	512	1262	100	100	285	0			
Total Benefit Payments	105	105	105	106	106	106	107	107	107	107	105	105	
Benefit Payments (BNYM)	53	57	49	53	69	57	48	63	53	47	60	60	
Benefit Payments (STO)	52	48	56	53	37	49	59	44	54	60	45	45	
Refunds	4	4	5	6	4	4	3	5	3	3	4	4	
Operational Expense	1	1	1	1	5	1	2	5	1	2	2	2	
Other	0	0	0	0	0	0	0	0	0	0			
Sources of Cash													
Asset Class Sales													
Liquid Asset Redemptions	305	195	165	318	572	1399	100	135	480	115	90	90	Rebal: Global Equity Liquidity $65m and Credit Liquidity $50m
Illiquid Asset Distributions	49	56	36	59	52	38	25	43	20	16	50	50	Private Asset Distributions
Illiquid Asset Redemptions	2		0	1	0	0	0	0	0	0			Hedge Funds / Portable Alpha
Employee / Employer Contributions	51	67	56	55	52	53	73	53	55	55	50	50	
Other	2	0	0	6	4	1	21	0	1	0	1	1	Suspense Account / Corporate Action / Overlay
Month Ending Cash, BNYM	$24	$33	$43	$52	$28	$47	$34	$23	$130	$51	$52	$53	
Corporate Action/Suspense	3	3	3	3	3	3	1	1	1	9	4	4	
Month Ending Cash, STO	22	36	30	25	30	30	40	39	36	25	20	20	
Month-End Capital Allocations													
Global Equity	6,476	6,382	6,338	6,363	6,317	6,276	6,132	5,639	5,109	5,430	5,136	5,099	
Risk Reduction & Mitigation	3,349	3,307	3,299	3,291	3,240	3,226	3,257	3,283	2,884	2,816	2,821	2,801	
Credit Oriented Fixed Income	2,286	2,298	2,293	2,251	2,240	2,248	2,263	2,263	2,152	2,046	2,170	2,154	
Real Assets	3,112	3,129	3,128	3,147	3,132	3,189	3,160	3,095	2,850	2,973	2,893	2,872	
Multi-Risk Allocation	421	539	639	760	890	1,074	1,190	1,254	1,263	1,301	1,447	1,436	
STO Cash	22	36	30	25	30	30	40	39	36	25	20	20	
Total (net of cash flows)	$15,666	$15,691	$15,727	$15,836	$15,851	$16,043	$16,043	$15,575	$14,295	$14,592	$14,487	$14,382	
Month-End Percentage Allocations													
Fund Balance (less STO)	$15,644	$15,655	$15,697	$15,812	$15,820	$16,014	$16,003	$15,535	$14,259	$14,567	$14,467	$14,362	
Global Equity	41.4%	40.8%	40.4%	40.2%	39.9%	39.2%	38.3%	36.3%	35.8%	37.3%	35.5%	35.5%	
Risk Reduction & Mitigation	21.4%	21.1%	21.0%	20.8%	20.5%	20.1%	20.4%	21.1%	20.2%	19.3%	19.5%	19.5%	
Credit Oriented Fixed Income	14.6%	14.7%	14.6%	14.2%	14.2%	14.0%	14.1%	14.6%	15.1%	14.0%	15.0%	15.0%	
Real Assets	19.9%	20.0%	19.9%	19.9%	19.8%	19.9%	19.7%	19.9%	20.0%	20.4%	20.0%	20.0%	
Multi-Risk Allocation	2.7%	3.4%	4.1%	4.8%	5.6%	6.7%	7.4%	8.1%	8.9%	8.9%	10.0%	10.0%	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

April Change in Value	Current Month's Weights Actual	Target	Var.	Range
321	37.2%	35.5%	1.7%	+/-5%
(68)	19.3%	19.5%	-0.2%	+/-3%
(106)	14.0%	15.0%	-1.0%	+/-4%
123	20.4%	20.0%	0.4%	+/-4%
38	8.9%	10.0%	-1.1%	+/-4%
(11)	0.2%	0.0%	0.2%	
297	100.0%	100.0%		

Tier	Liquidity Summary $ Allocation	% Allocation
Tier 1 (1-5 days)	$ 3,026,593,486	21%
Tier 2 (5-90 days)	$ 7,119,604,058	49%
Tier 3 (90-365 days)	$ 367,039,825	3%
Tier 4 (1 year +)	$ 4,053,521,306	28%

YTD Monthly History – Volume

For the month ending 6/30/2020

BNY MELLON

Securities Lending

Public Employees Retirement of New Mexico

	ENDING BALANCES FOR THE MONTH				AVERAGE BALANCES FOR THE MONTH			PERFORMANCE	
Month	**Market Value Lendable Securities**	**Market Value Lendable on Loan**	**Percent of Portfolio on Loan**	**Monthly Gross Client Earnings**	**Market Value Lendable Securities**	**Market Value Securities on Loan**	**Percent of Portfolio on Loan**	**Return on Available Assets for Lending**	**Return on Loaned Assets**
July	8,007,102,307.02	566,566,722.50	7.08%	213,450.63	8,194,057,491.56	563,924,113.08	6.88%	3.13 bp	45.42 bp
August	7,921,683,555.65	568,359,434.00	7.17%	195,752.50	7,924,556,090.49	563,842,691.78	7.12%	2.96 bp	41.66 bp
September	7,907,167,032.35	547,435,491.67	6.92%	210,942.35	7,992,858,837.15	559,202,514.93	7.00%	3.17 bp	45.27 bp
October	7,913,118,986.52	554,084,050.95	7.00%	236,498.07	7,888,491,276.76	550,256,642.66	6.98%	3.60 bp	51.58 bp
November	7,876,367,903.34	579,567,977.19	7.36%	203,450.98	7,901,318,585.55	567,954,120.59	7.19%	3.09 bp	42.99 bp
December	7,435,055,085.84	561,664,955.13	7.55%	218,245.33	7,692,751,655.16	569,893,717.39	7.41%	3.40 bp	45.95 bp
January	7,308,699,412.02	556,805,200.12	7.62%	231,510.01	7,473,293,251.64	561,345,617.32	7.51%	3.72 bp	49.49 bp
February	7,030,854,447.24	542,048,009.68	7.71%	191,467.89	7,374,568,334.93	550,600,411.58	7.47%	3.12 bp	41.73 bp
March	5,827,215,845.67	538,907,109.08	9.25%	234,036.23	6,179,840,726.71	527,633,671.01	8.54%	4.54 bp	53.23 bp
April	6,291,191,479.15	561,103,377.42	8.92%	265,922.09	5,981,932,226.98	544,414,190.59	9.10%	5.33 bp	58.61 bp
May	6,260,969,600.05	564,785,347.77	9.02%	225,842.99	6,239,774,556.75	559,024,566.01	8.96%	4.34 bp	48.48 bp
June	6,298,578,569.67	564,017,555.52	8.95%	186,286.16	6,401,798,997.89	566,190,360.95	8.84%	3.49 bp	39.48 bp
AVERAGE	7,173,167,018.71	558,778,769.25	7.79%	217,783.77	7,270,436,835.96	557,023,551.49	7.66%	3.59 bp	46.92 bp