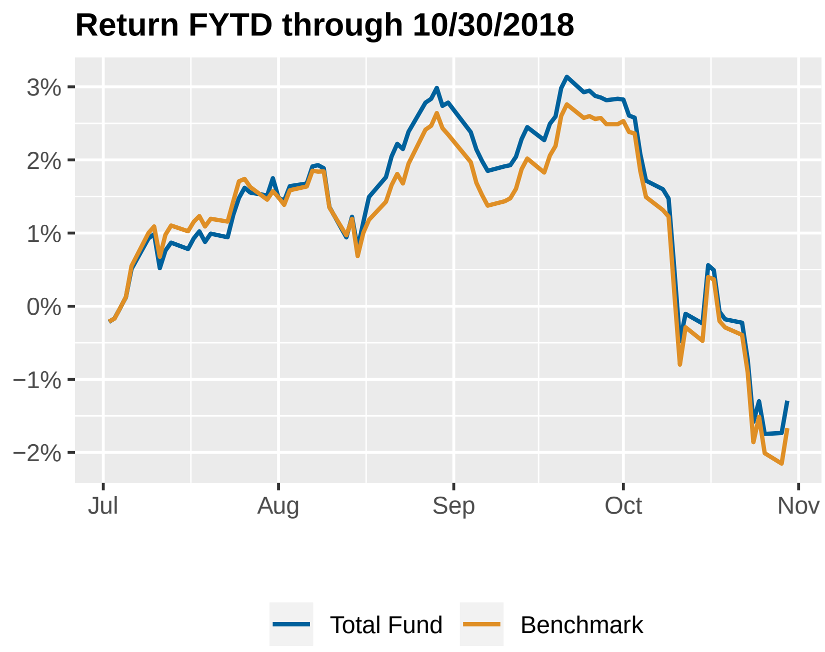
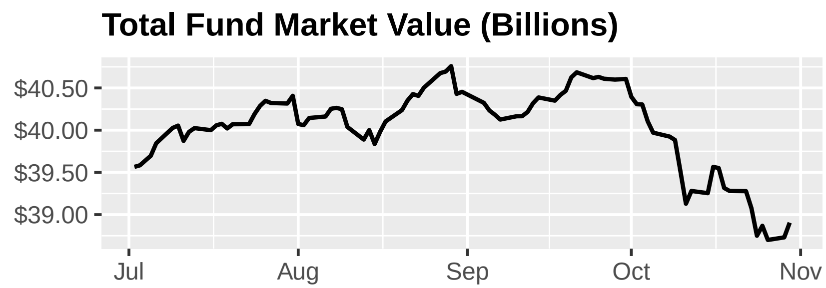
CIO Board Report

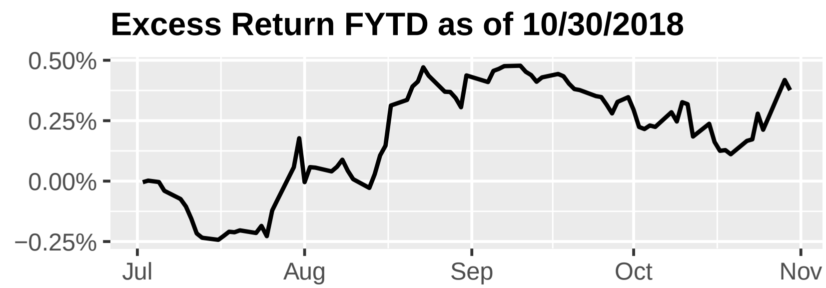
Arizona State Retirement System

November 9, 2018

Total Fund FYTD Return & Current Positioning



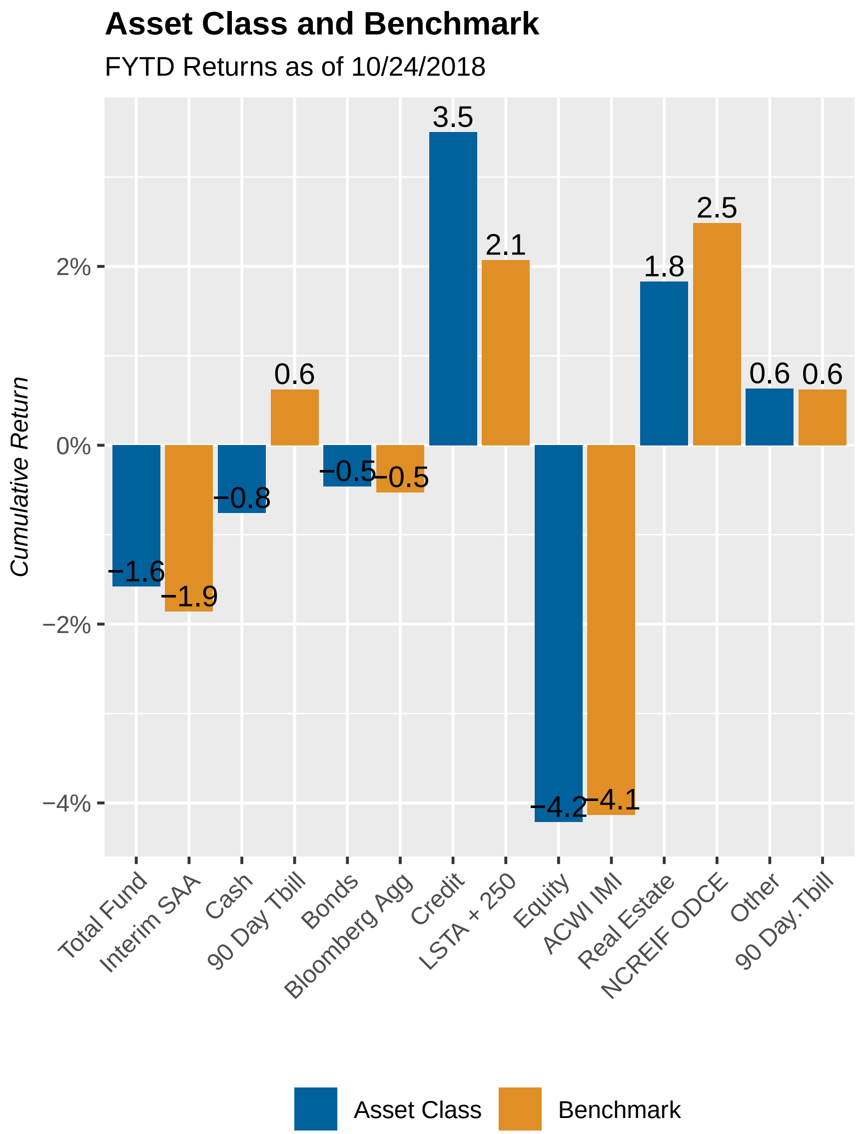


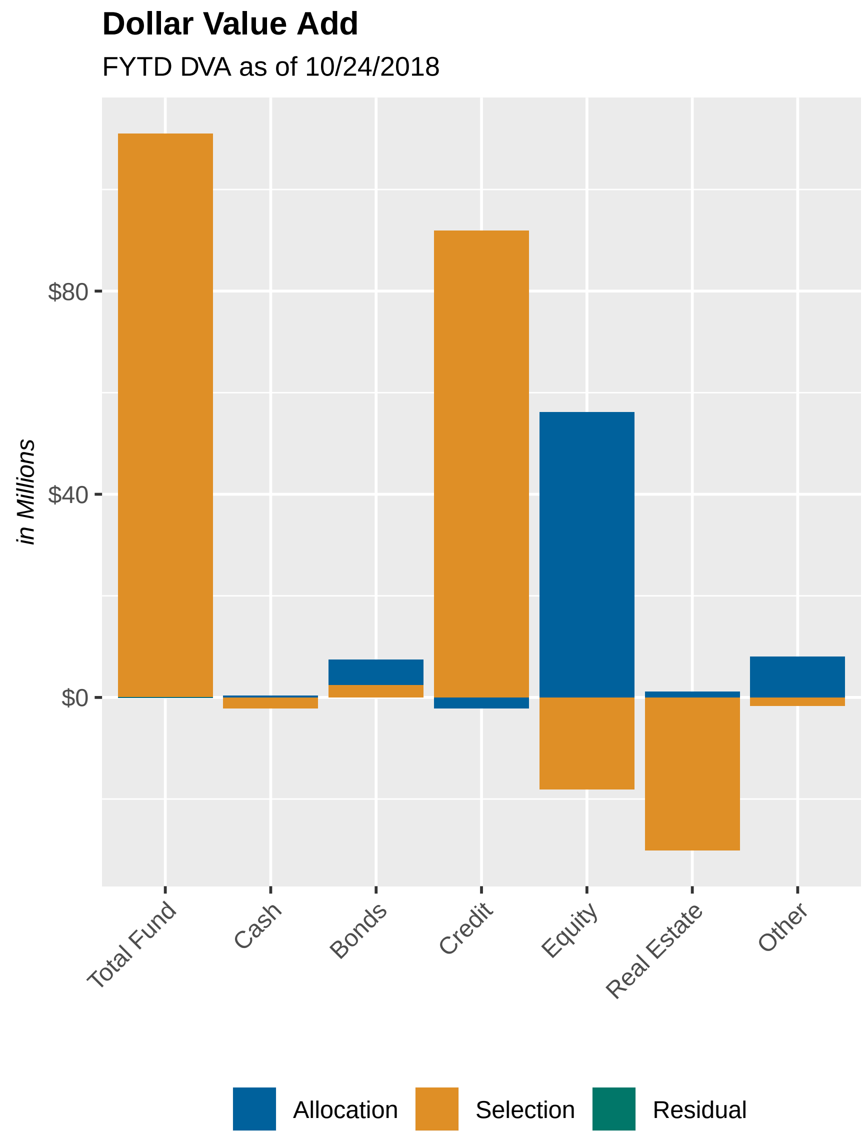


Total Fund Exposure

Name	NAV ($ mm)	NAV (%)	Notional ($ mm)	Exposure (%)	Target (%)	Active Weight (%)	Active Weight ($ mm)
Cash	637.0	1.6	639.0	1.6	0.0	1.6	639.0
Bonds	3840.0	9.9	3840.0	9.9	12.0	-2.1	-810.0
Credit	6549.0	16.9	6549.0	16.9	17.0	-0.1	-39.0
Equity	21572.0	55.7	21572.0	55.7	59.0	-3.3	-1291.0
Real Estate	4793.0	12.4	4793.0	12.4	12.0	0.4	143.0
Other	1359.0	3.5	1359.0	3.5	0.0	3.5	1359.0
Total Fund	38750.0	100.0	38750.0	100.0	100.0	0.0	0.0

Total Fund Returns & Dollar Value Add



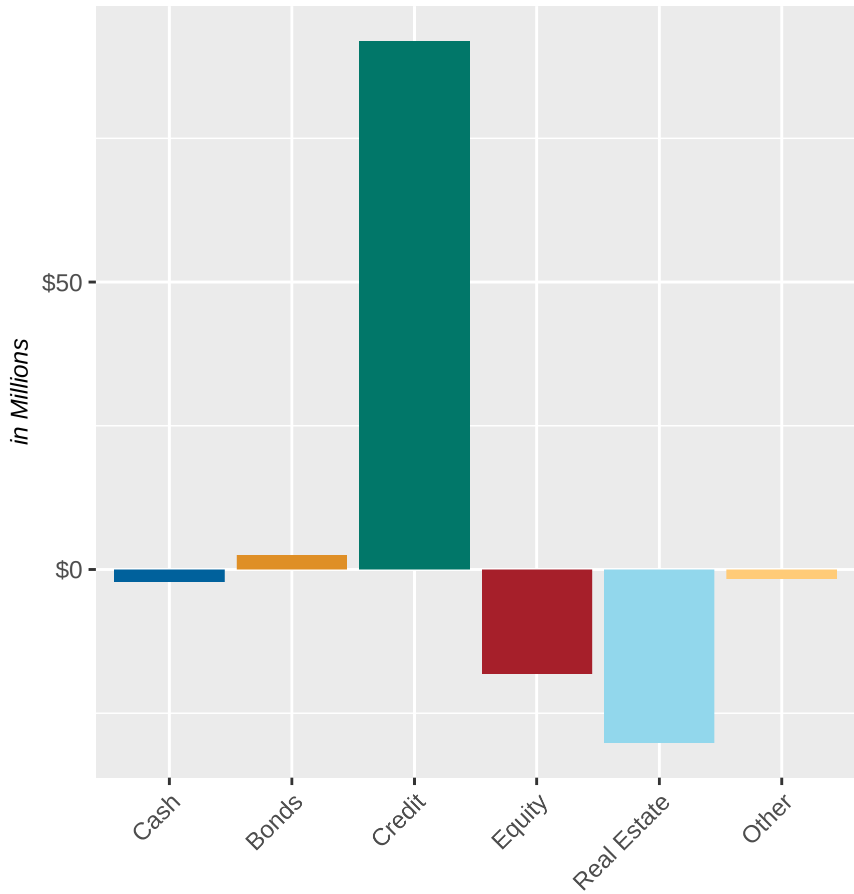


Allocation Effect by Asset Class

Selection Effect by Asset Class

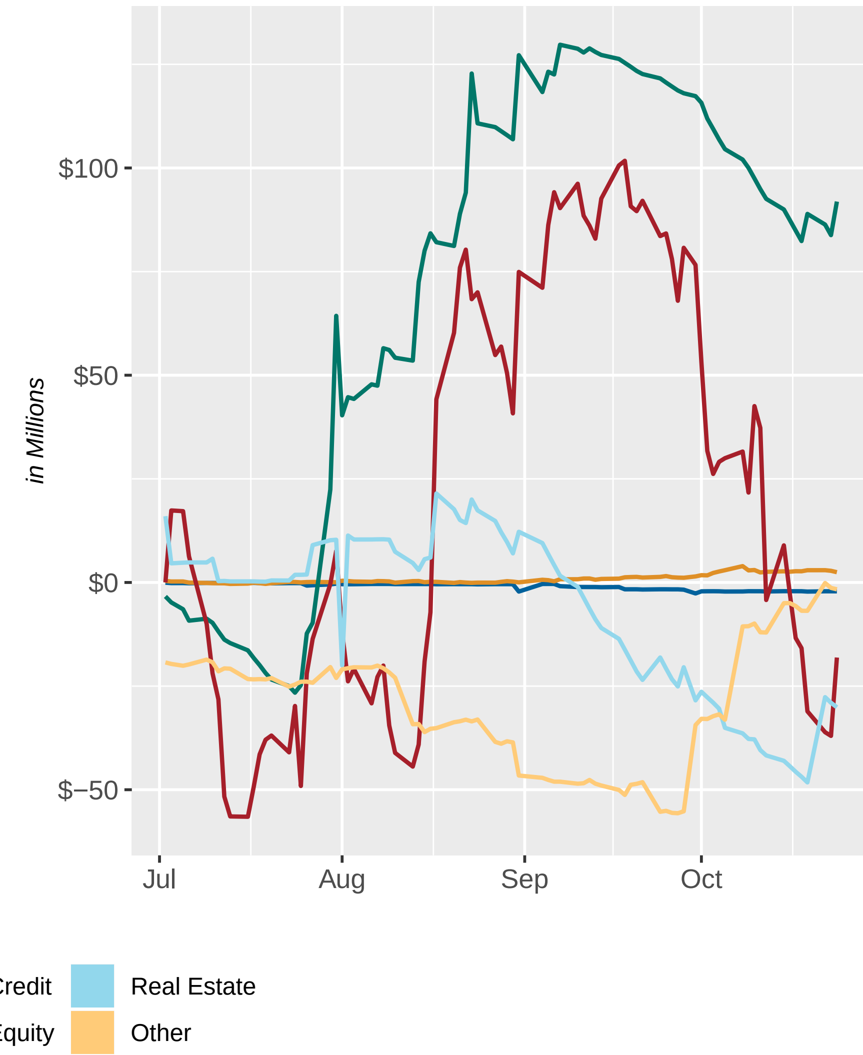
Selection Effect by Asset Class

Relative to Benchmark as of 10/24/2018



Cumulative Selection Effect by Asset Class

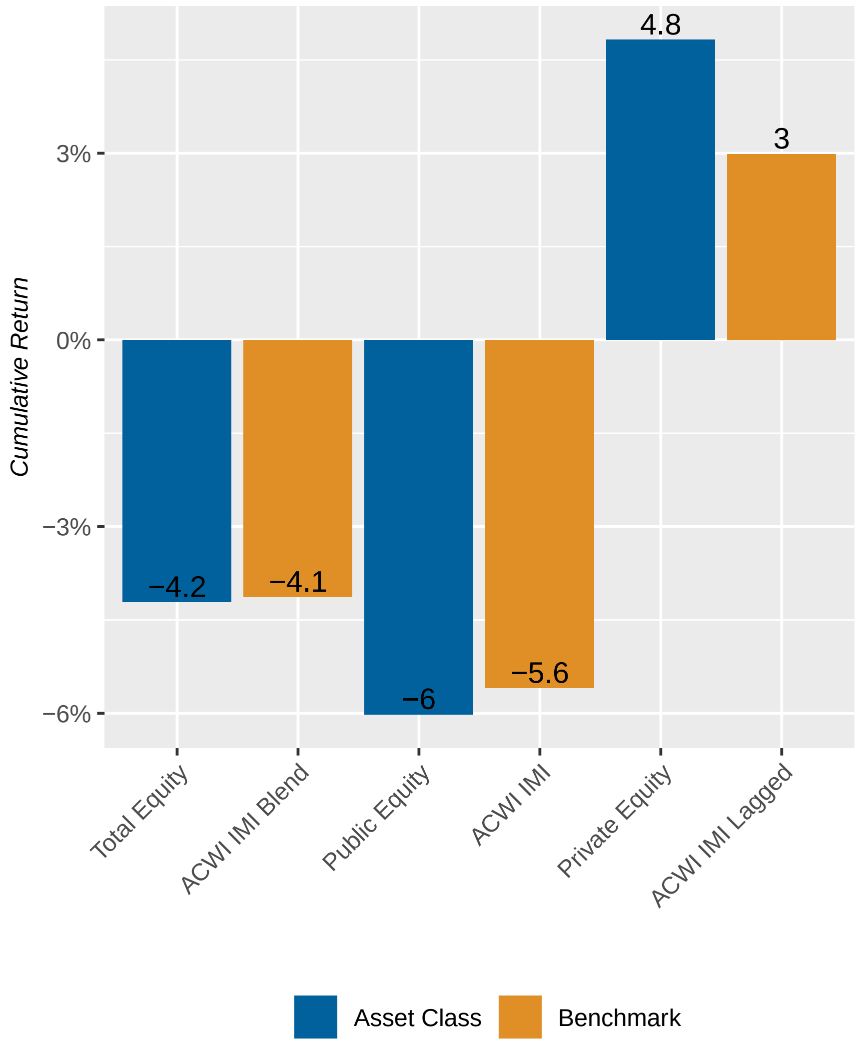
Relative to Benchmark as of 10/24/2018



Total Equity Returns & Dollar Value Add

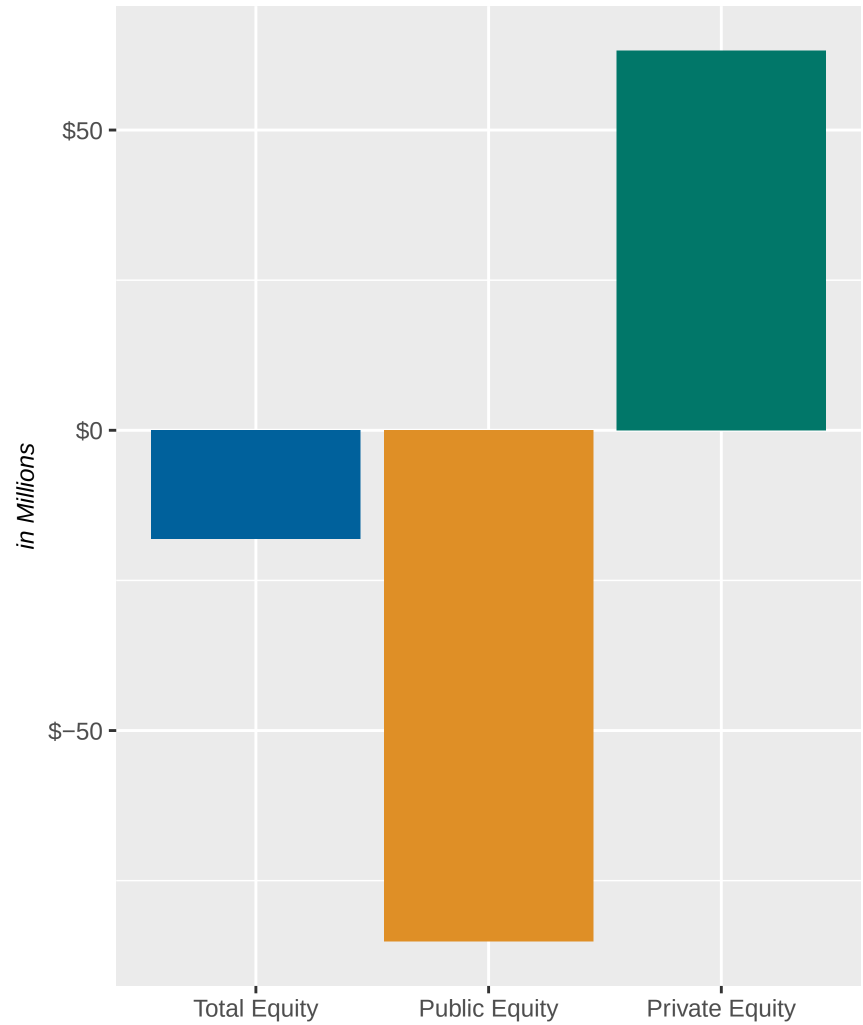
Total Equity and Benchmark

FYTD Returns as of 10/24/2018

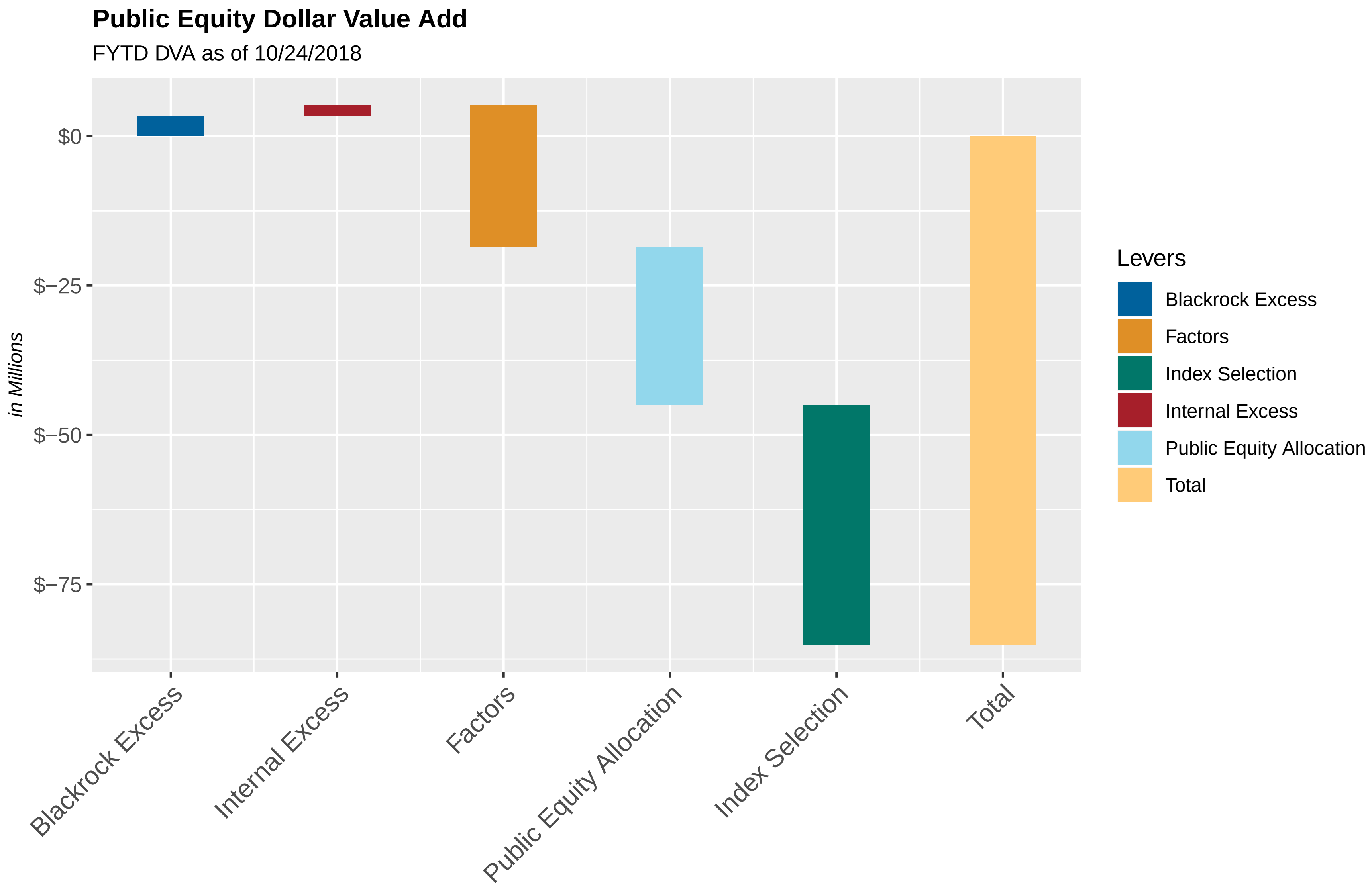


Total Equity Dollar Value Add

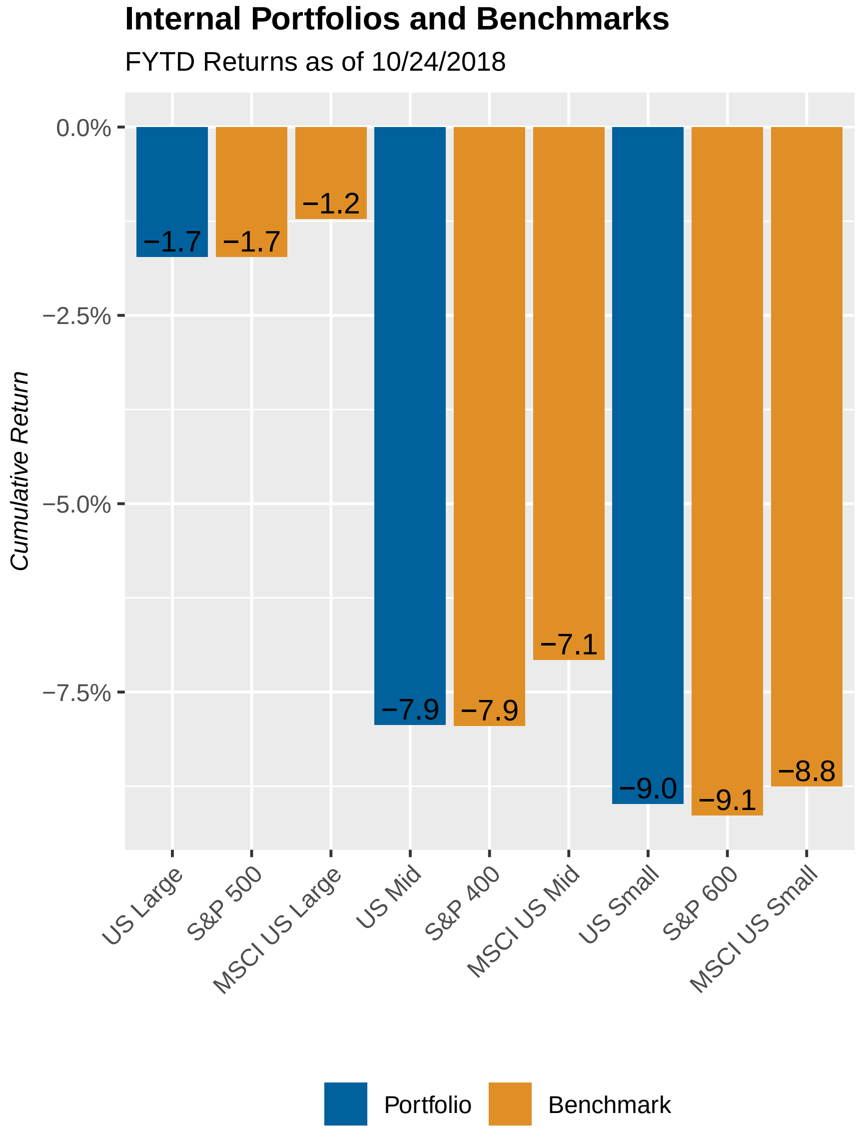
FYTD DVA as of 10/24/2018

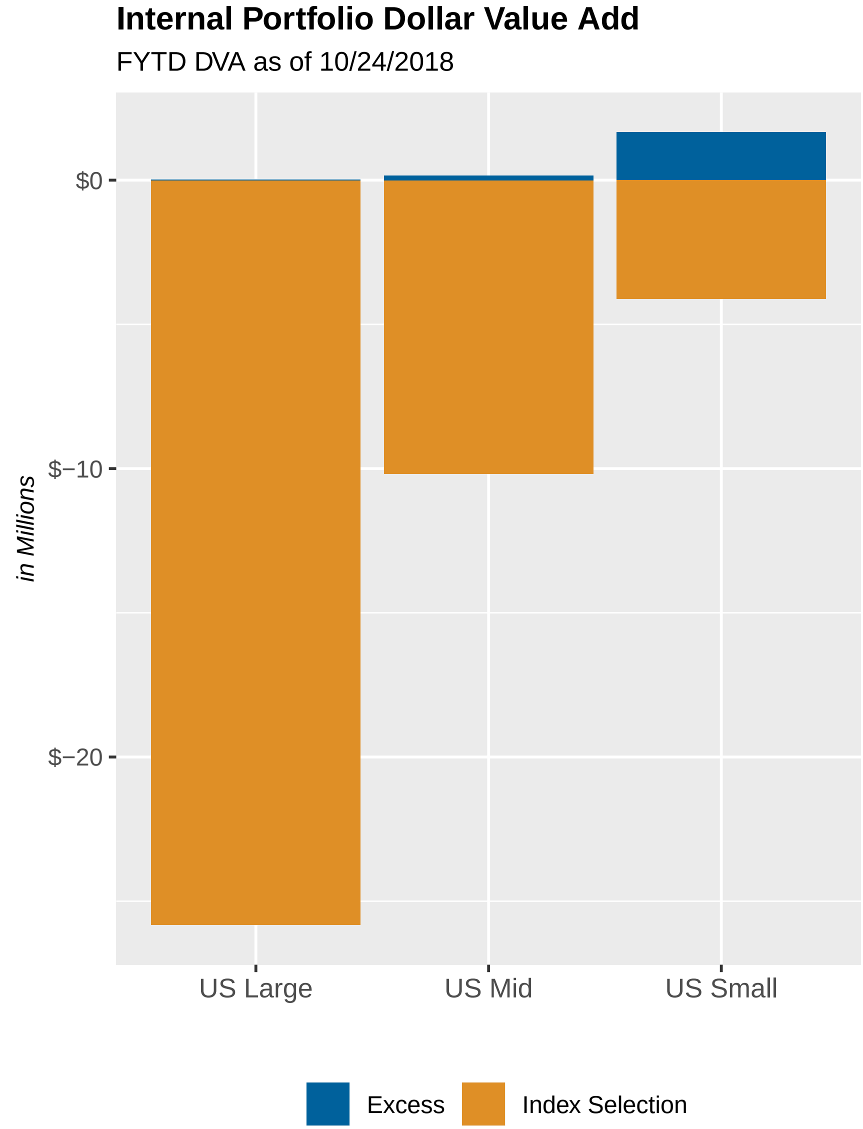


Public Equity "Levers"

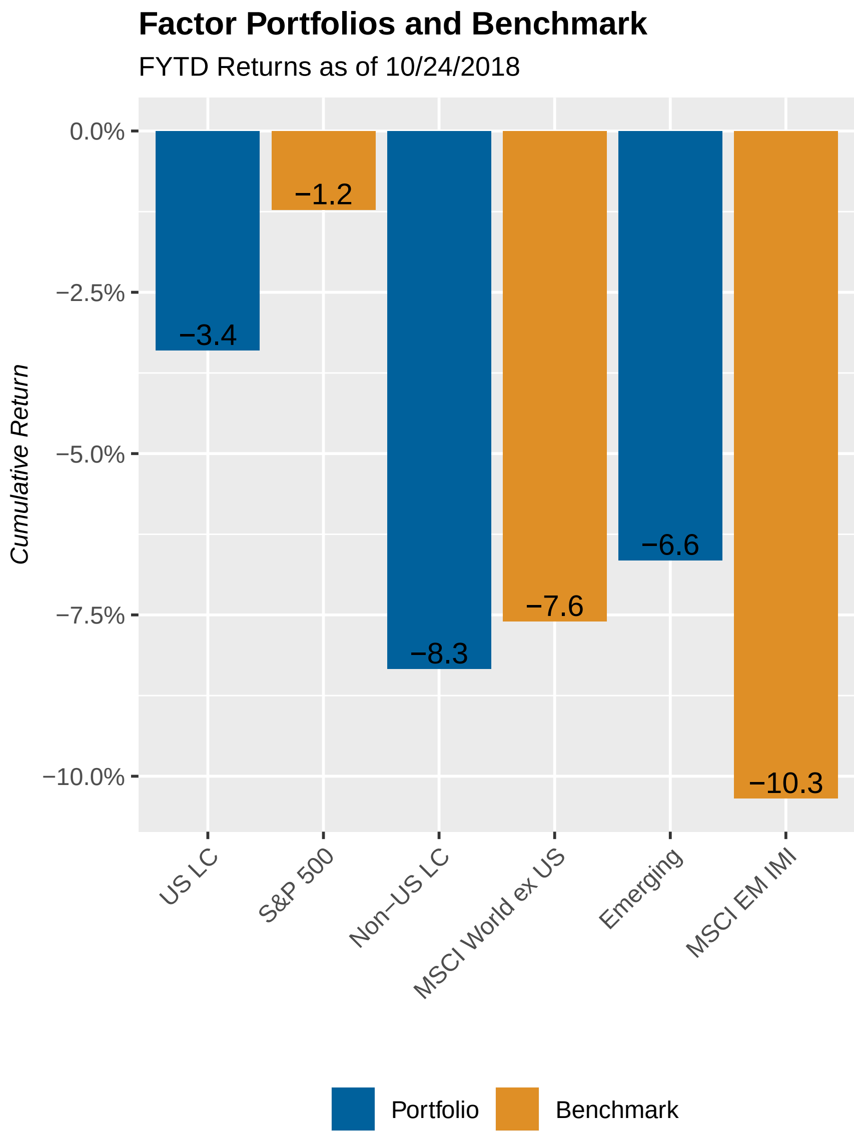


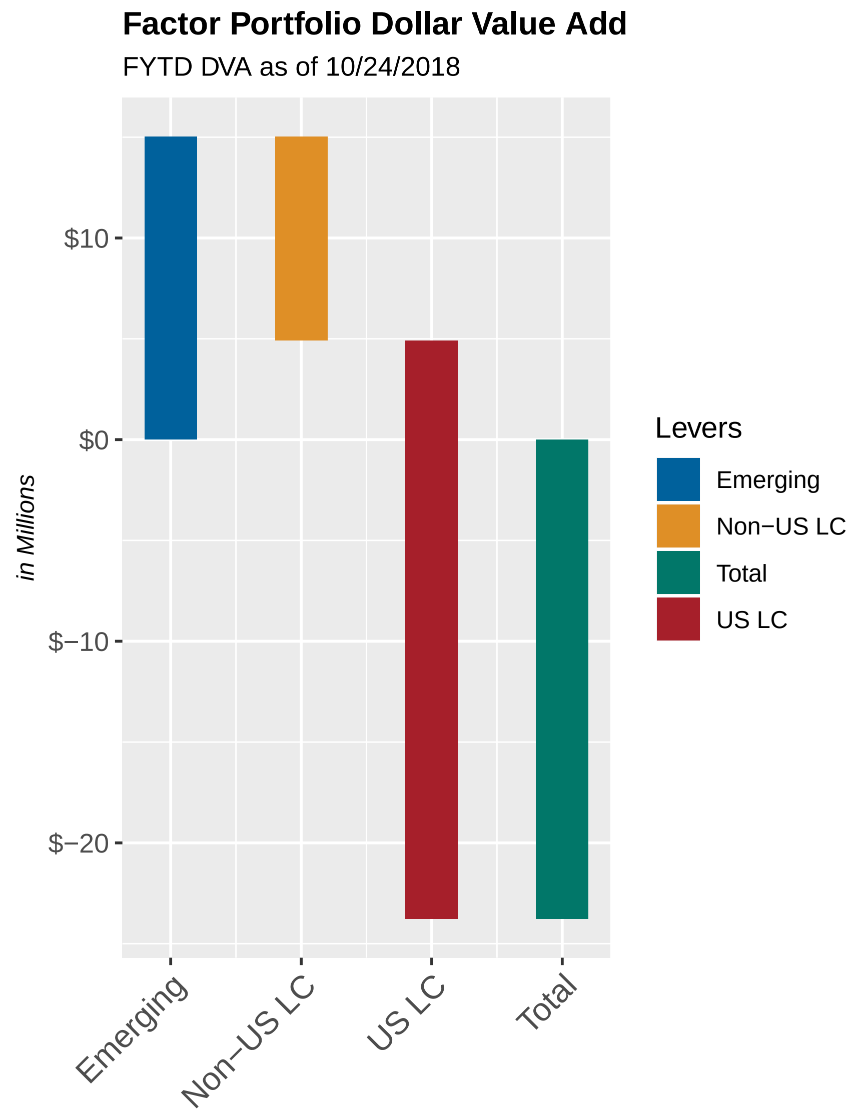
Internally Managed Portfolios





Factor Portfolios

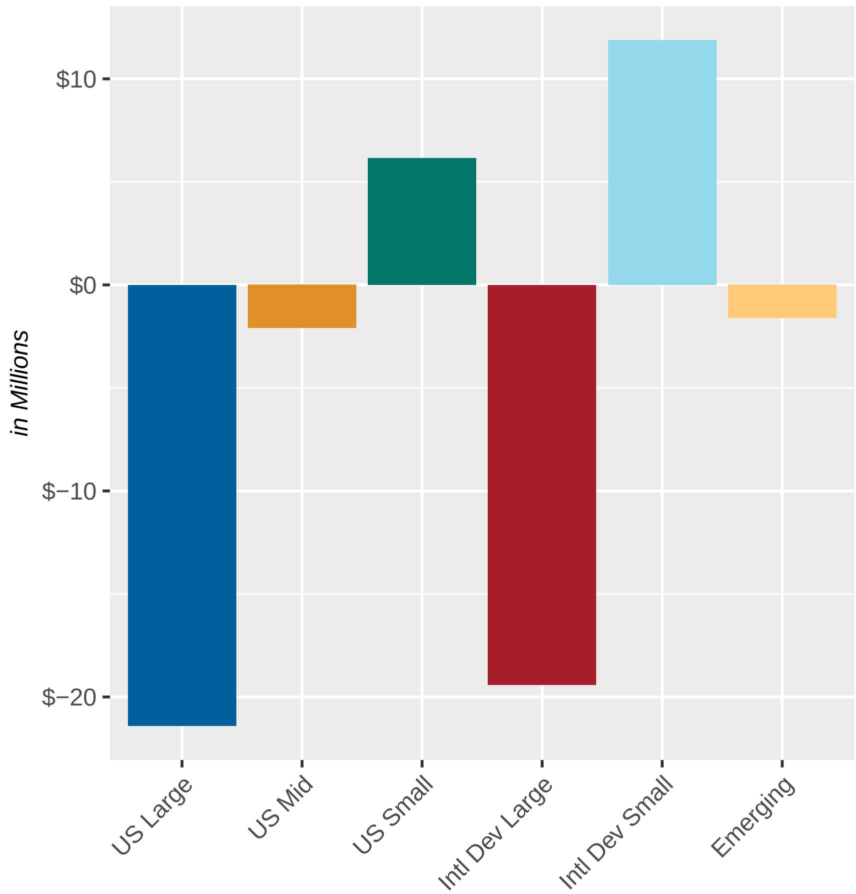




Public Equity Allocation

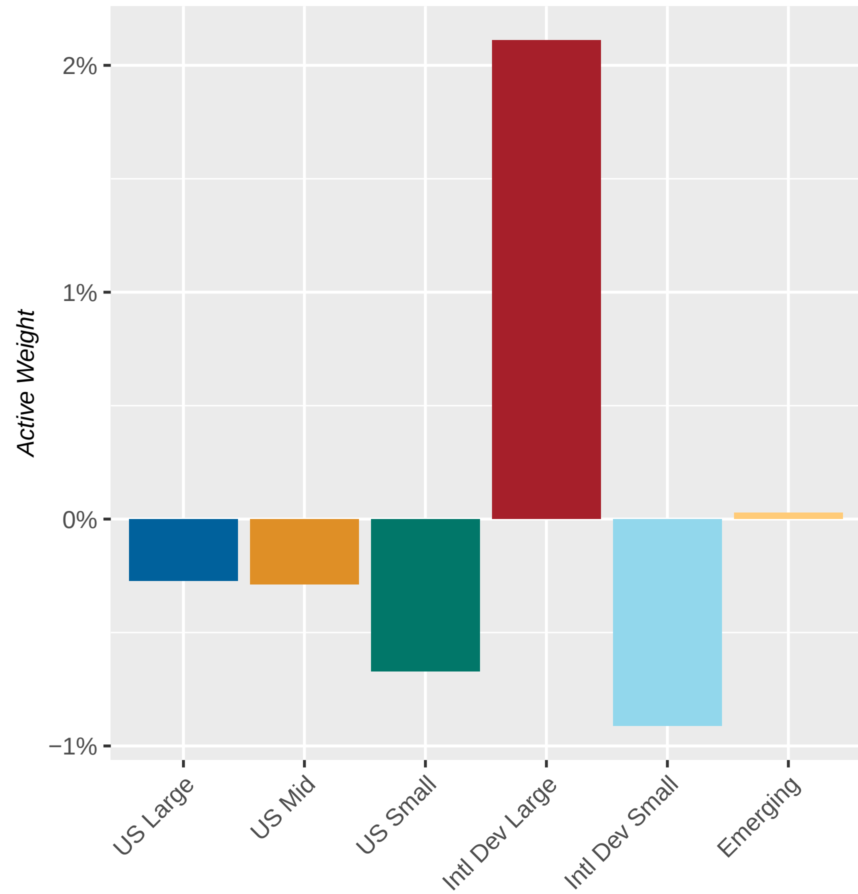
Allocation Effect by ACWI Subcomponents

Relative to ACWI IMI as of 10/24/2018



Composite Average Active Weights

Relative to ACWI as of 10/24/2018

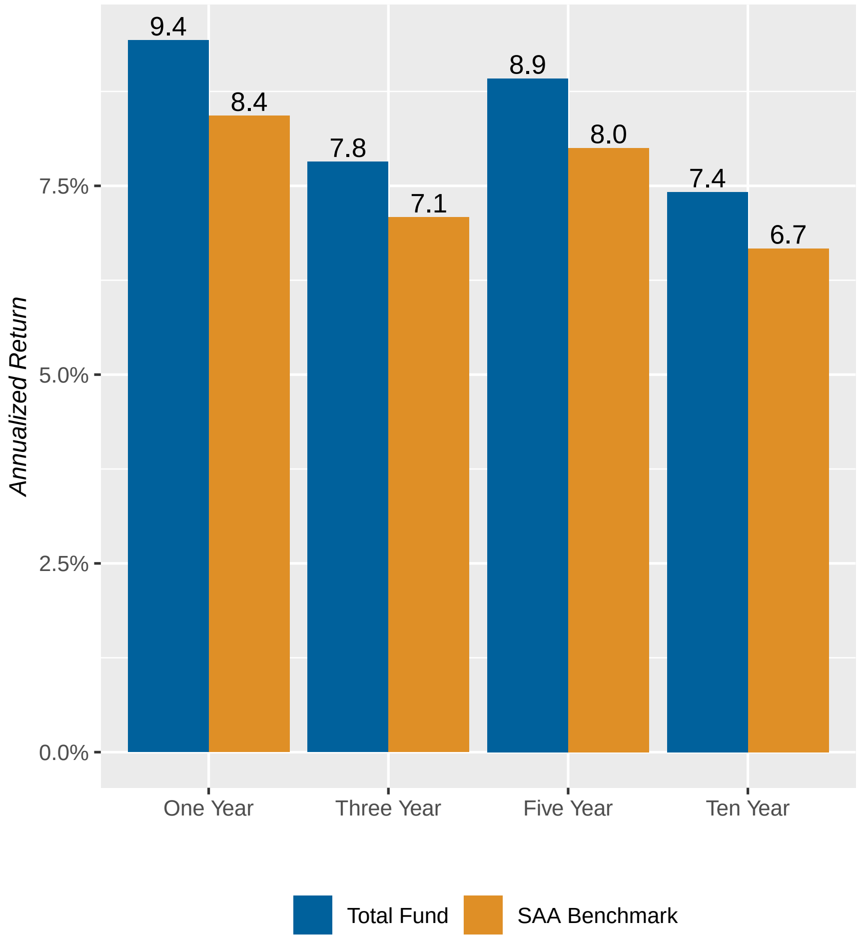


US Large | US Small | Intl Dev Small
US Mid | Intl Dev Large | Emerging

Trailing Returns & Dollar Value Add - 6/30/2018

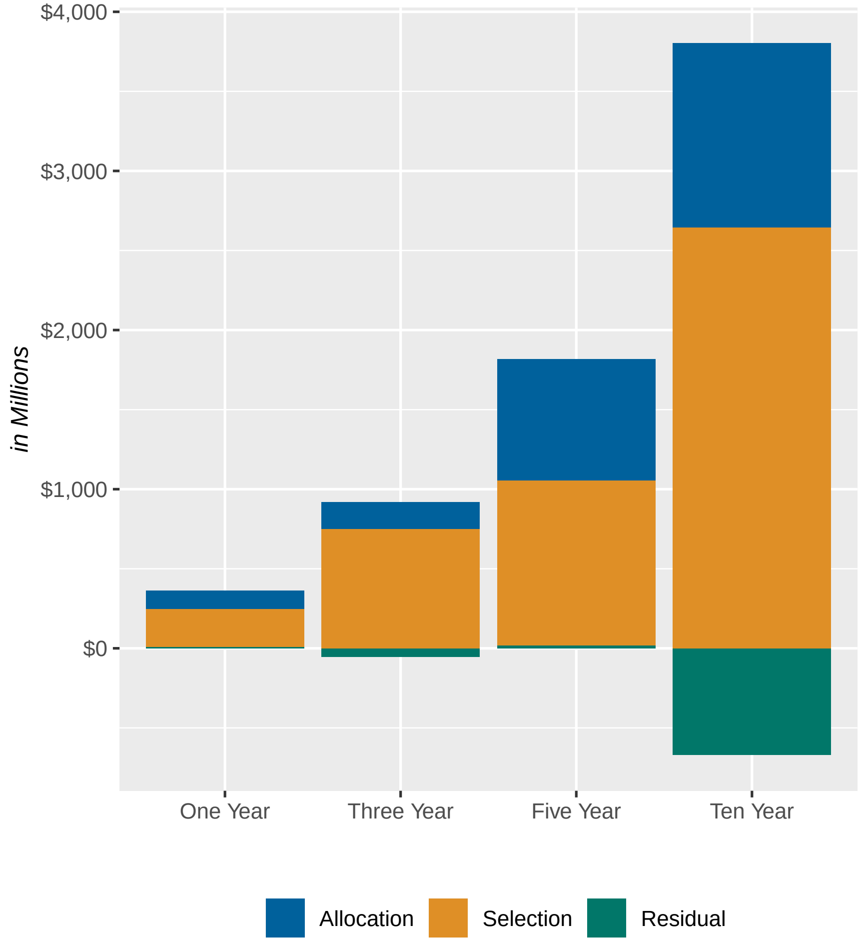
Total Fund and SAA Benchmark

Trailing Period Returns as of 6/30/18

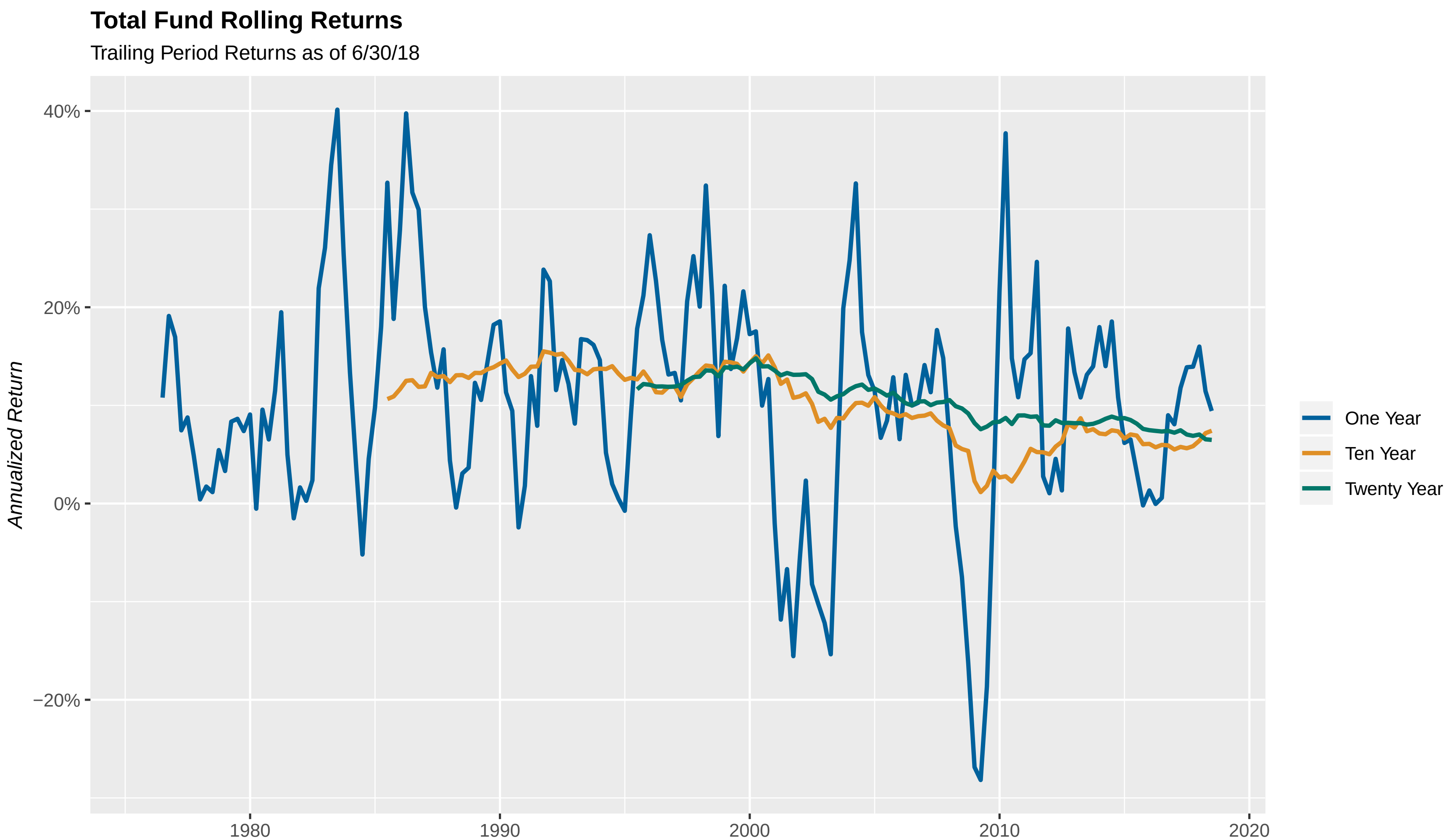


Total Fund Dollar Value Add

Relative to SAA Benchmark as of 6/30/18



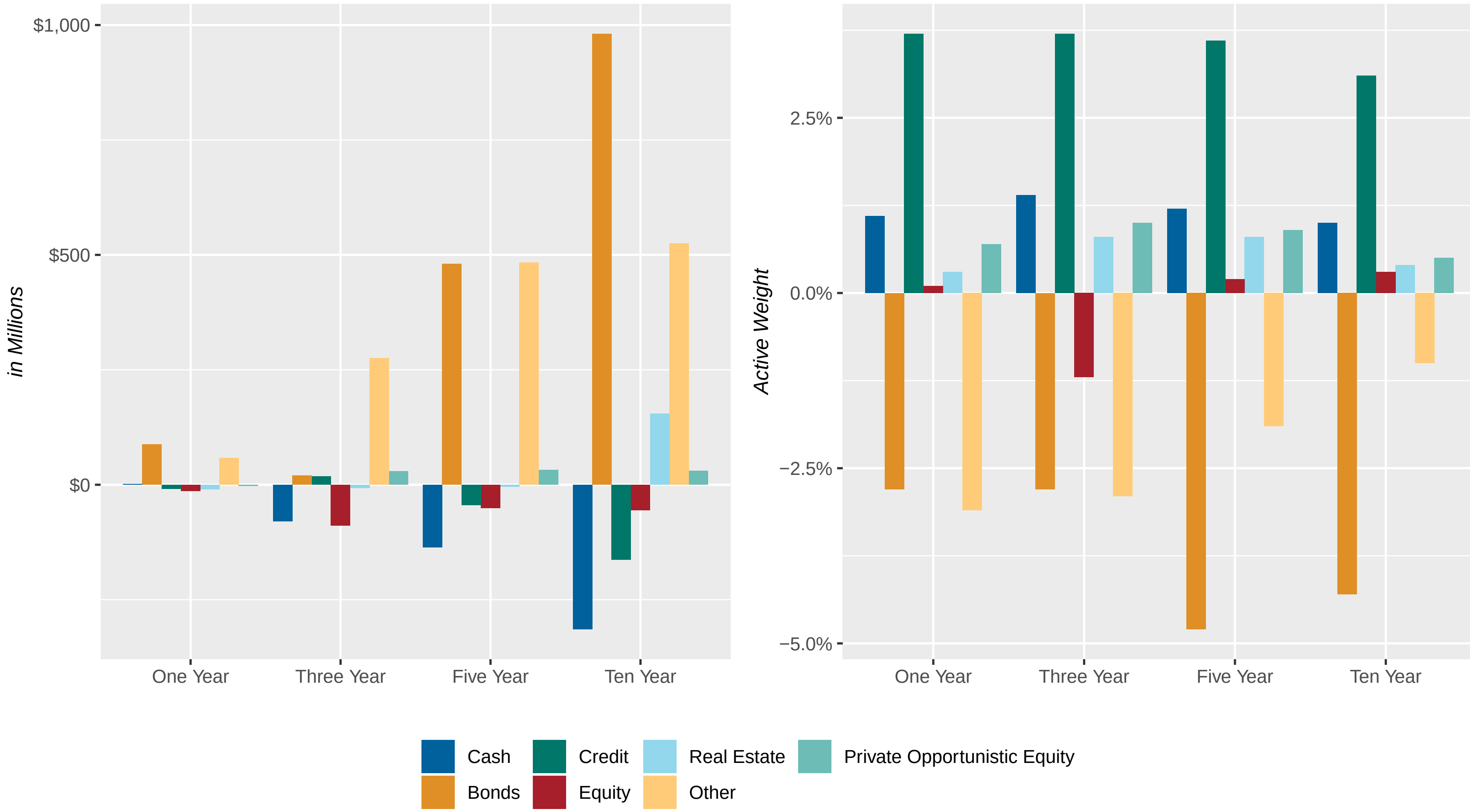
Total Fund Returns - 6/30/2018



Allocation Effect - 6/30/2018

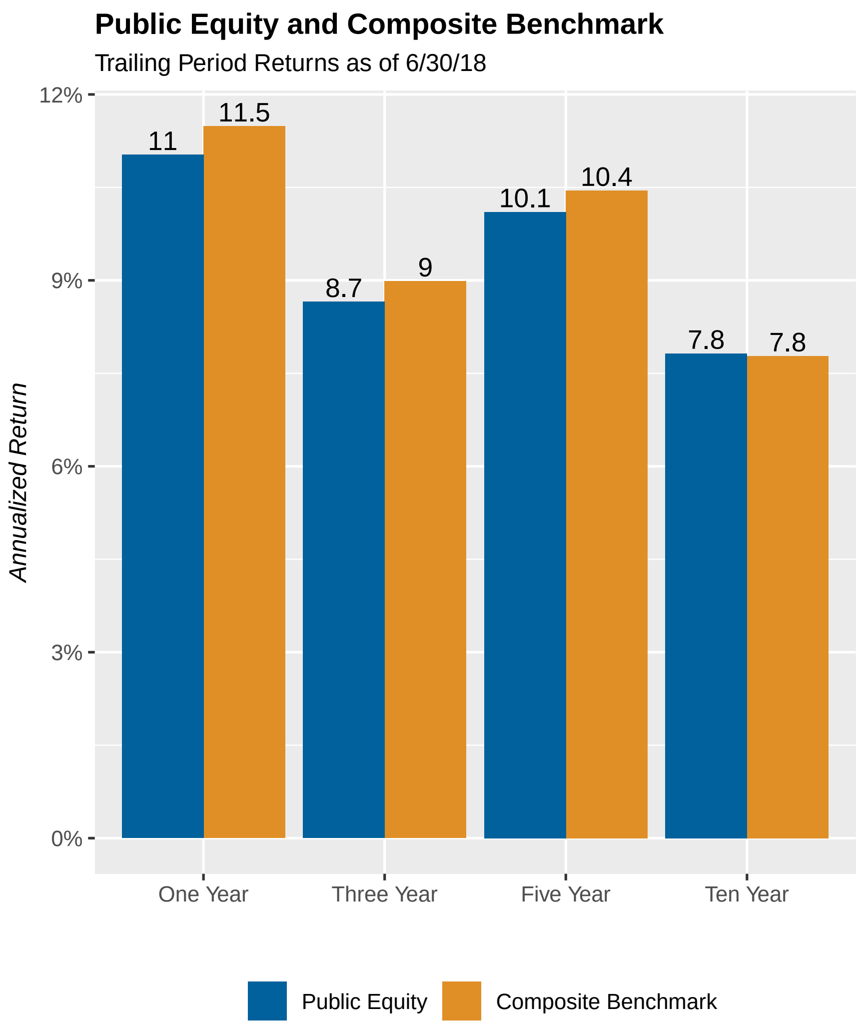
Allocation Effect by Asset Class
Relative to SAA Benchmark as of 6/30/18

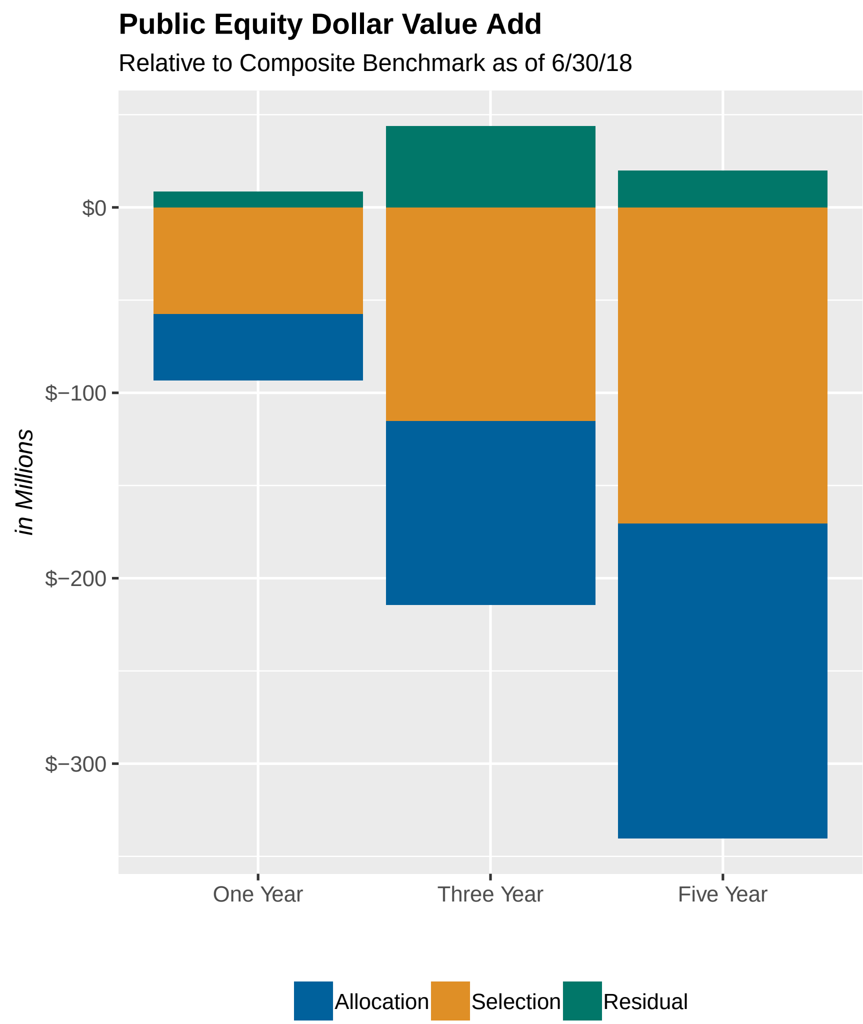
Asset Class Average Active Weights
Relative to SAAP as of 6/30/18



Selection Effect - 6/30/2018

Public Equities Returns & DVA - 6/30/2018

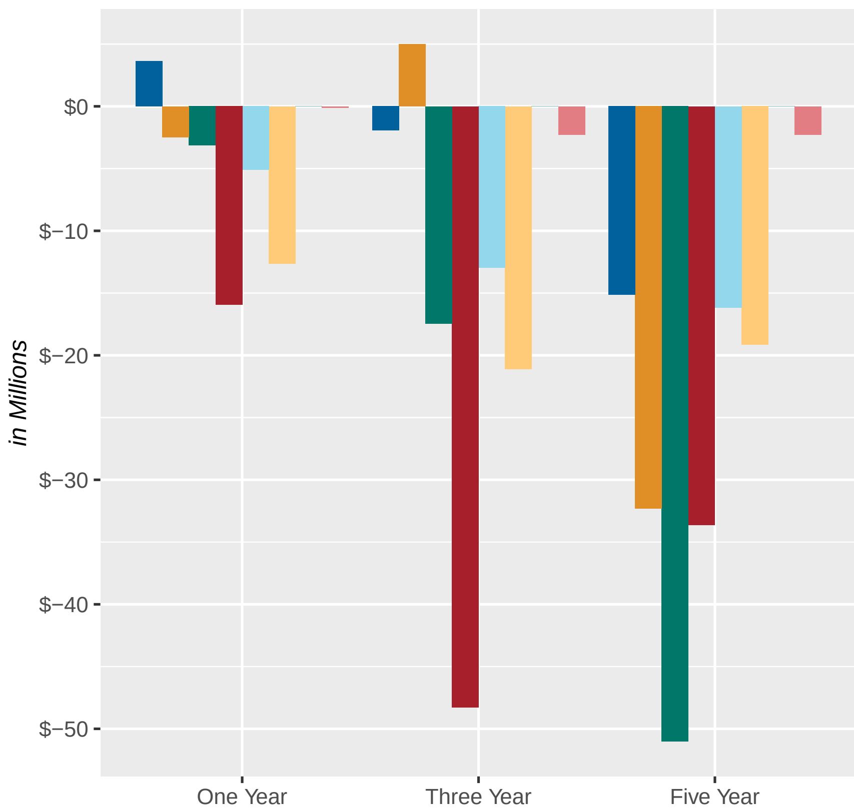




Allocation Effect - 6/30/2018

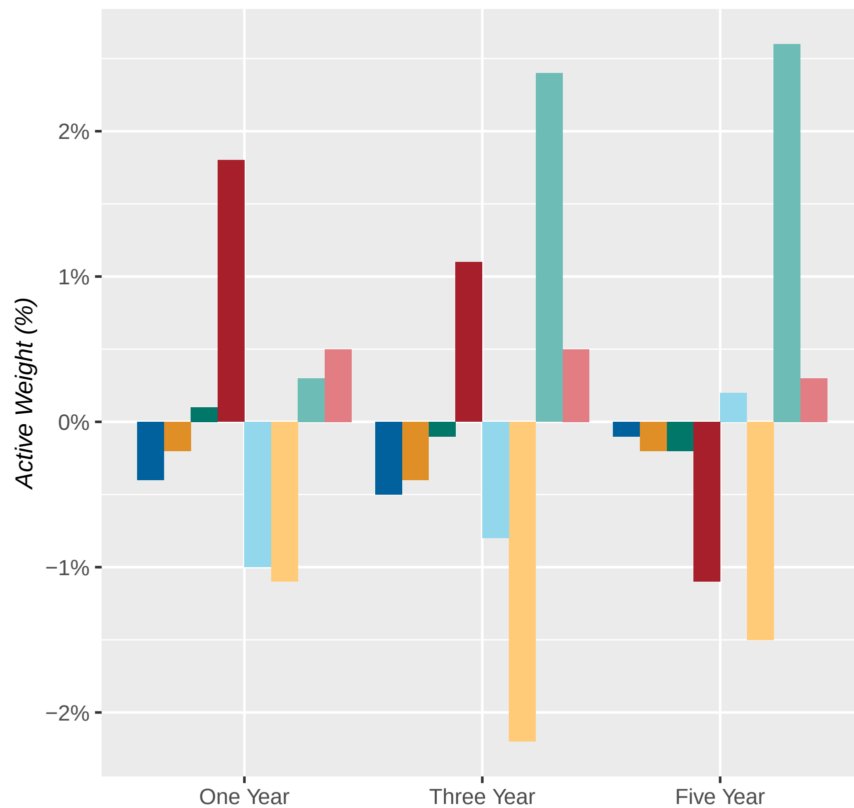
Public Equity Allocation Effect by Sub Asset Class

Relative to Composite Benchmark as of 6/30/18



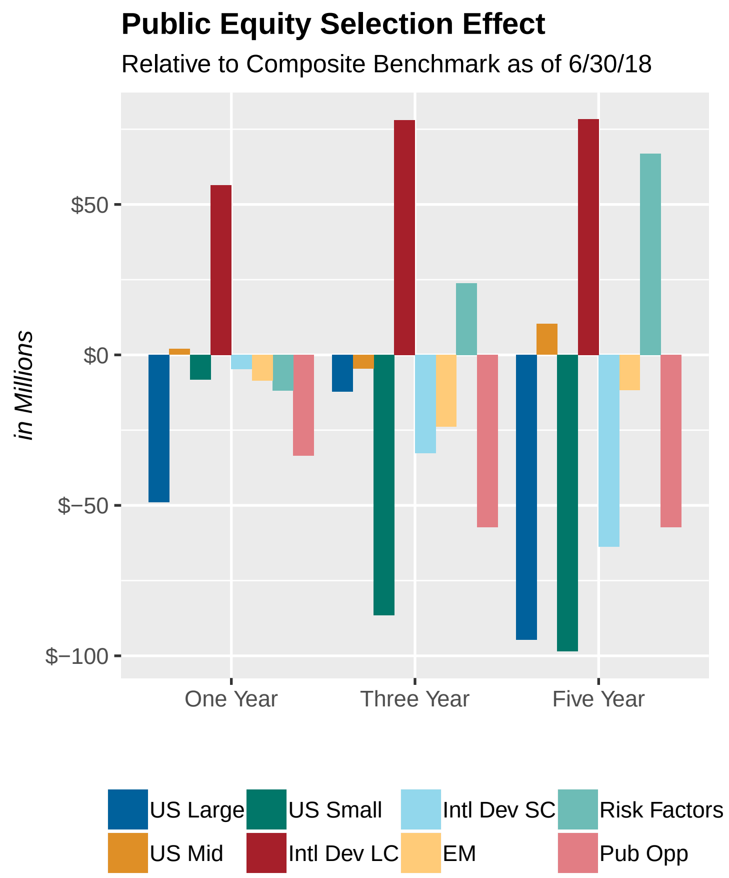
Public Equity Average Monthly Active Weight

Relative to Composite Benchmark as of 6/30/18



US Large Cap
US Mid Cap
US Small Cap
Int'l Dev Large Cap
Int'l Dev Small Cap
Emerging Markets
Risk Factors
Public Opportunistic

Selection Effect - 6/30/2018



Annualized Returns

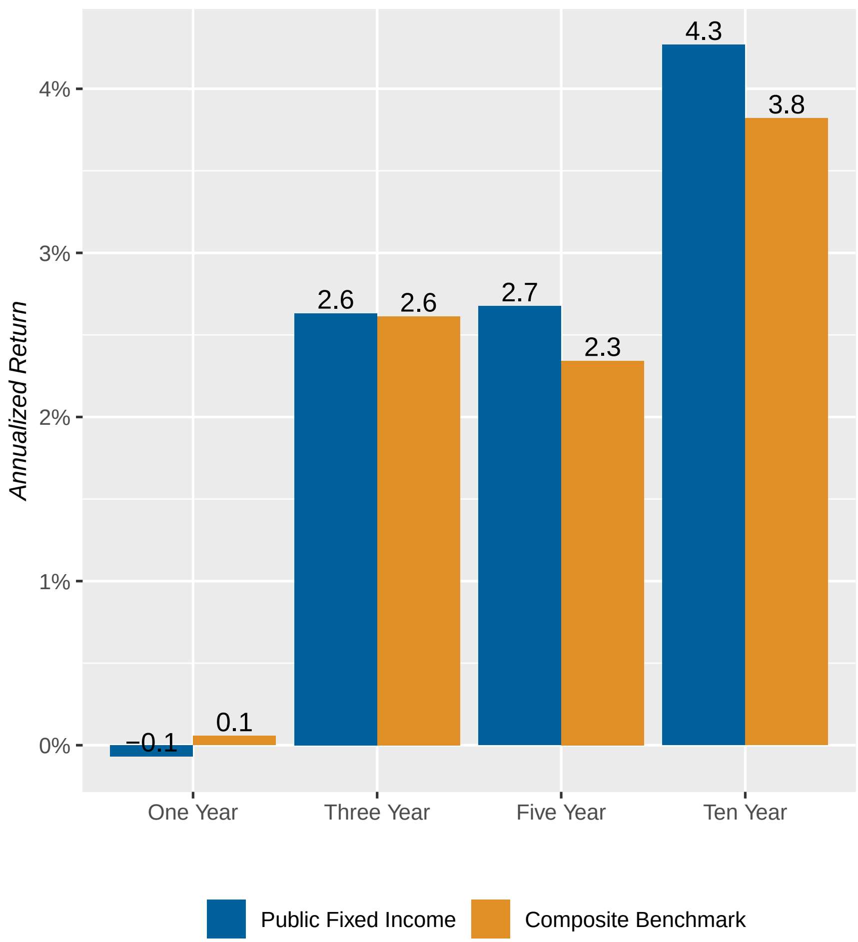
as of 6/30/18

Composite	One Year	Three Year	Five Year	Ten Year
US Large Cap	13.67%	11.86%	13.19%	10.18%
Benchmark	14.37%	11.93%	13.42%	10.17%
Excess	-0.7%	-0.07%	-0.23%	0.01%
US Mid Cap	13.69%	10.8%	12.79%	10.76%
Benchmark	13.5%	10.89%	12.69%	10.78%
Excess	0.18%	-0.09%	0.1%	-0.02%
US Small Cap	19.62%	11.09%	12.84%	11.77%
Benchmark	20.5%	13.84%	14.6%	12.25%
Excess	-0.88%	-2.74%	-1.76%	-0.48%
Int'l Dev Large Cap	7.67%	5.28%	6.65%	NA%
Benchmark	6.84%	4.9%	6.46%	NA%
Excess	0.83%	0.38%	0.19%	NA%
Int'l Dev Small Cap	11.5%	8.74%	10.09%	NA%
Benchmark	12.45%	10.09%	11.33%	NA%
Excess	-0.95%	-1.35%	-1.25%	NA%
Emerging Markets	7.75%	5.07%	4.83%	NA%
Benchmark	8.2%	5.6%	5.05%	NA%
Excess	-0.46%	-0.53%	-0.21%	NA%
Public Opportunistic	-7.15%	NA%	NA%	NA%
Benchmark	15.02%	NA%	NA%	NA%
Excess	-22.17%	NA%	NA%	NA%

Public Fixed Income Returns & DVA - 6/30/2018

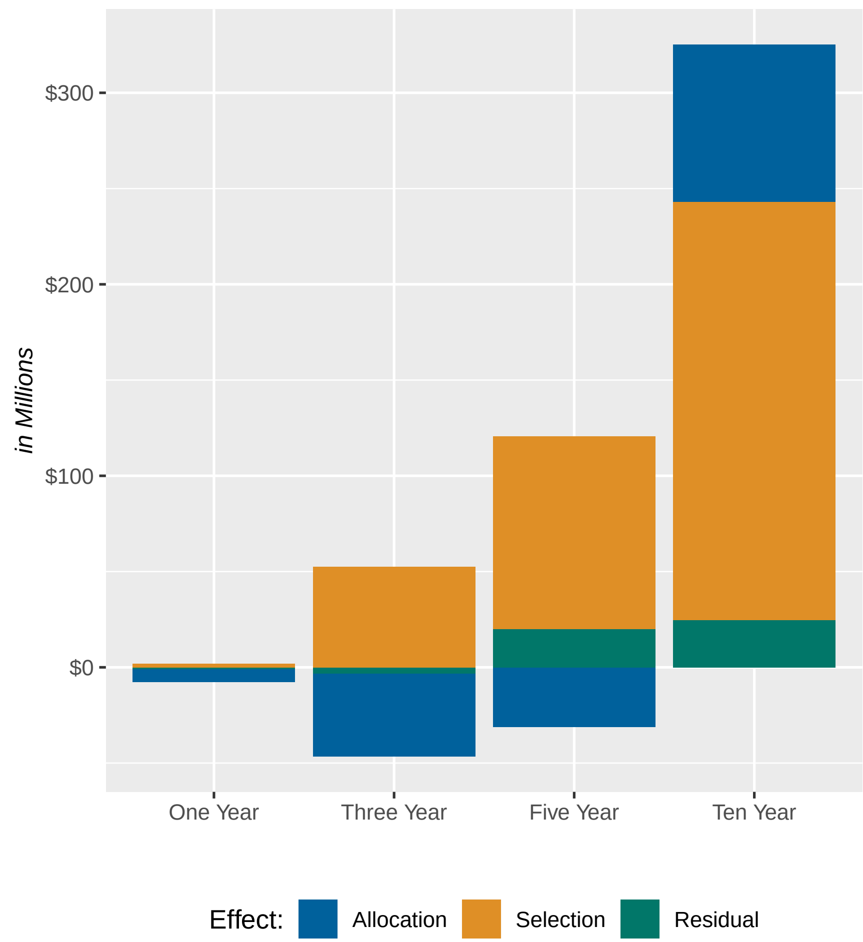
Public Fixed Income and Composite Benchmark

Trailing Period Returns as of 6/30/18

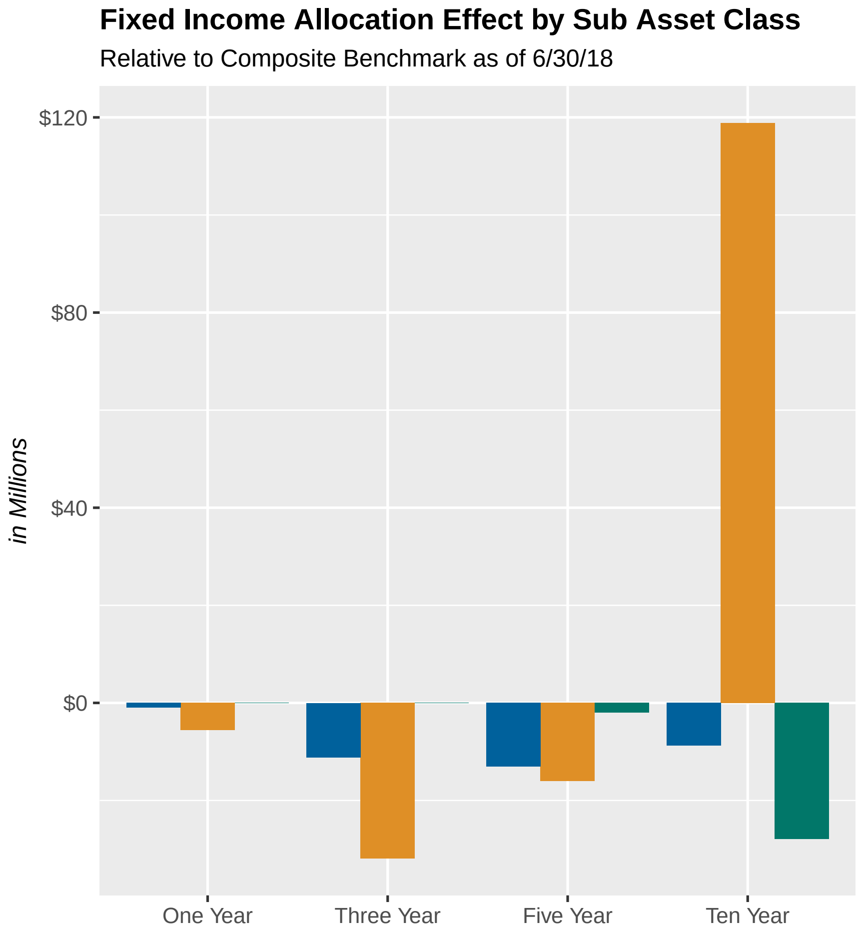


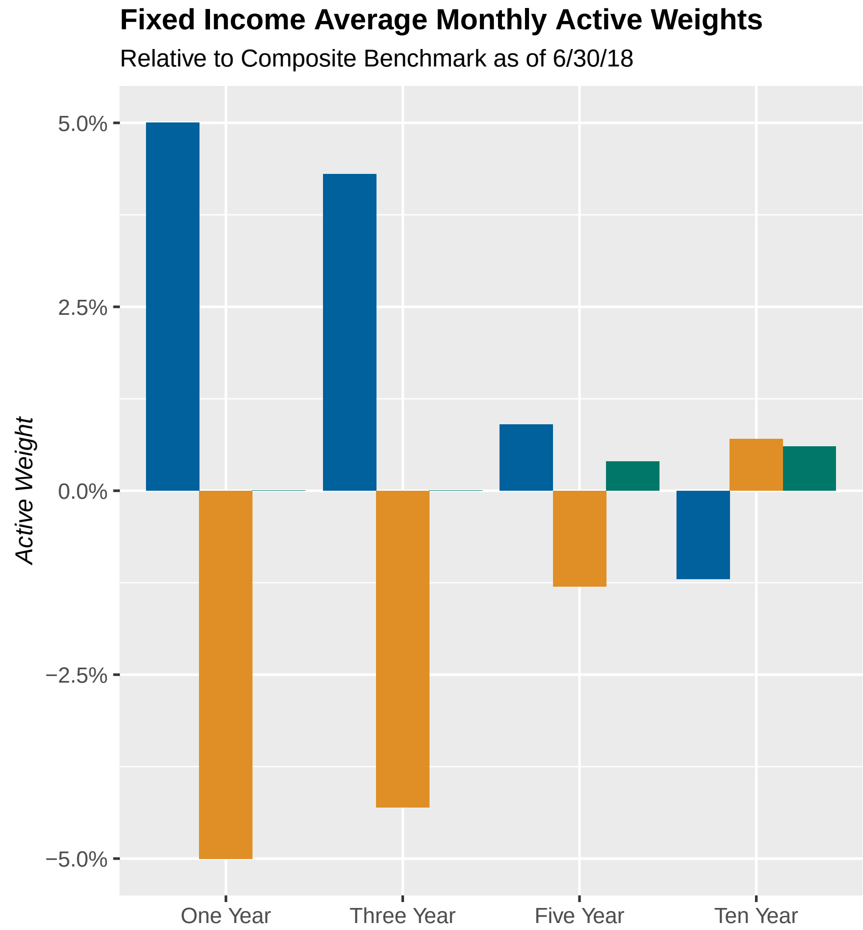
Public Fixed Income Dollar Value Add

Relative to Composite Benchmark as of 6/30/18



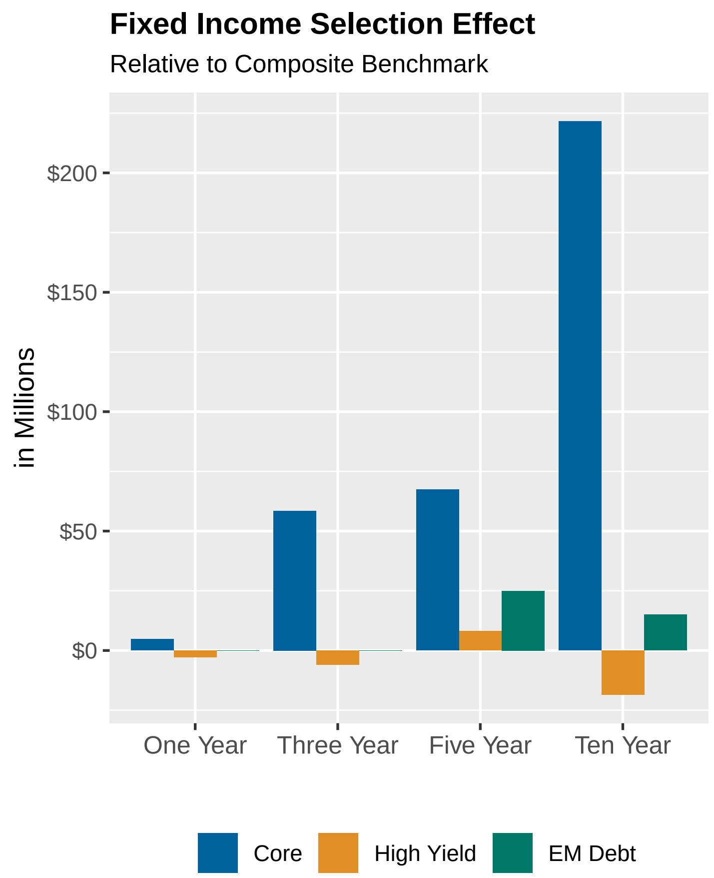
Allocation Effect - 6/30/2018





Interest Rate Sensitive   High Yield Composite   Emerging Market Debt

Selection Effect - 6/30/2018



Annualized Returns

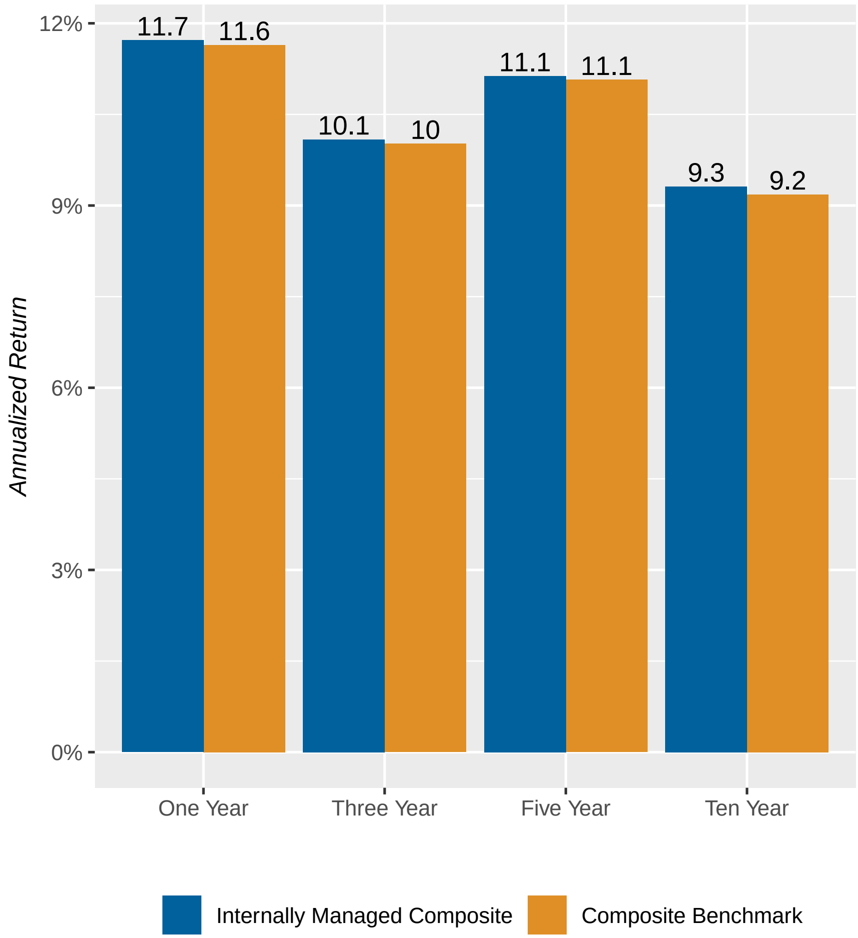
as of 6/30/18

Composite	One Year	Three Year	Five Year	Ten Year
Interest Rate Sensitive	-0.28%	2.13%	2.58%	4.07%
Benchmark	-0.4%	1.72%	2.27%	3.72%
Excess	0.12%	0.41%	0.3%	0.35%
High Yield Composite	1.9%	5.1%	5.47%	NA%
Benchmark	2.62%	5.53%	5.51%	NA%
Excess	-0.72%	-0.43%	-0.05%	NA%

Internally Managed Portfolios - 6/30/2018

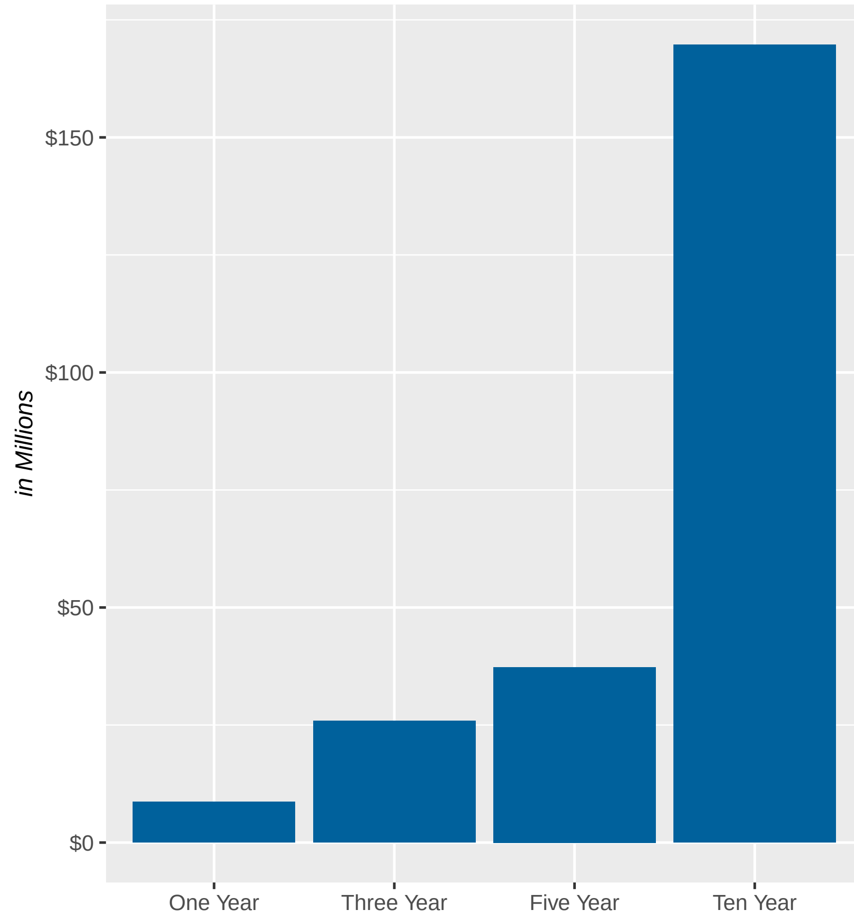
Internal Portfolios and Composite Benchmark

Trailing Period Returns as of 6/30/18



Internal Portfolios Dollar Value Add

Relative to Composite Benchmark as of 6/30/18

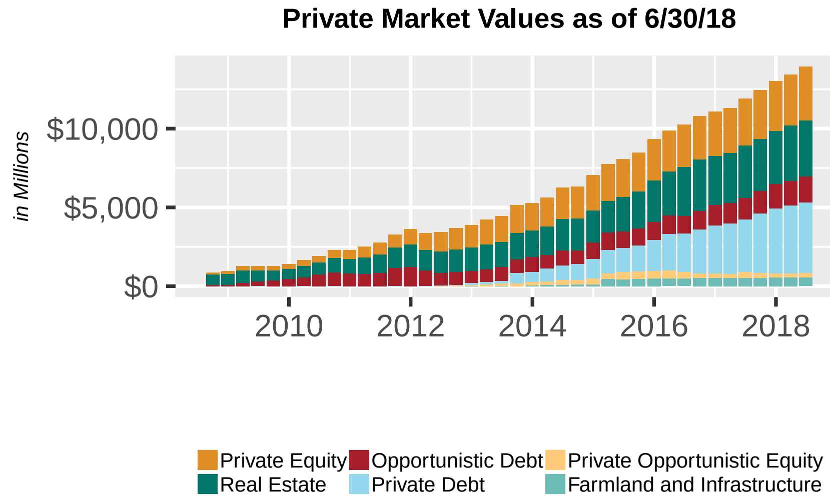


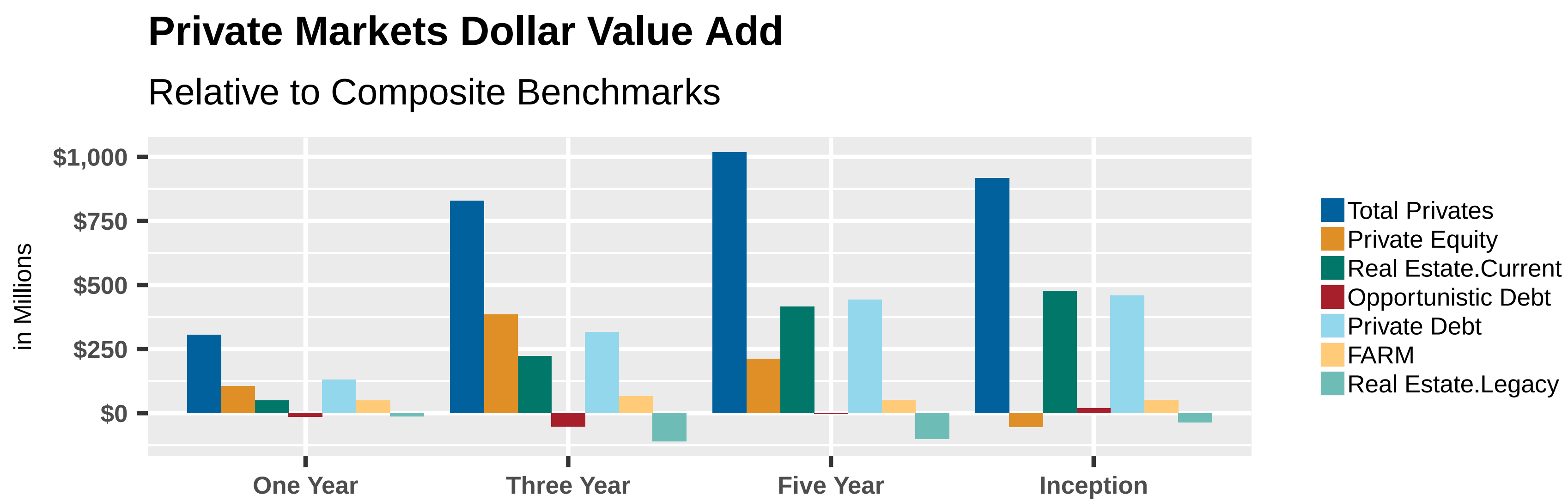
Private Markets Decomposition - 6/30/2018

Annualized IRRs

as Reported 6/30/18

	One Year	Three Year	Five Year	Inception
Total Private Markets	10.2%	10.47%	11.28%	10.25%
Benchmark	7.77%	8.11%	9.28%	9.08%
Excess	2.43%	2.36%	2%	1.17%





Private Markets Composites - 6/30/2018

Annualized IRRs

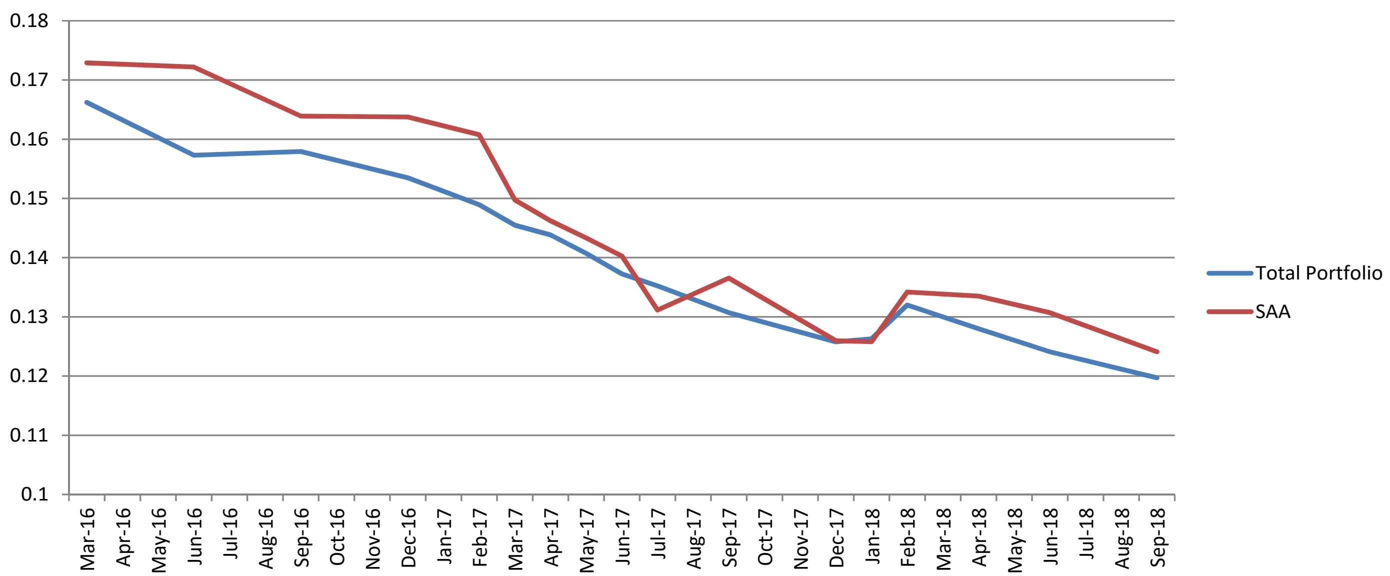
as Reported 6/30/18

	One Year	Three Year	Five Year	Inception
Private Equity	13.56%	12.17%	12.66%	12.24%
PE Benchmark	10.39%	8.2%	11.29%	12.46%
PE Excess	3.17%	3.96%	1.38%	-0.23%
Real Estate Current	8.34%	11.99%	14.12%	14.53%
RE Current Benchmark	6.67%	9.21%	9.92%	9.93%
RE Current Excess	1.66%	2.78%	4.19%	4.6%
Real Estate Legacy	3.08%	5.82%	10.06%	5.87%
RE Legacy Benchmark	6.61%	10.68%	11.85%	6.09%
RE Legacy Excess	-3.52%	-4.85%	-1.78%	-0.22%
Opportunistic Debt	6.07%	5.71%	6.56%	9.4%
Opp Debt Benchmark	7.08%	6.95%	6.61%	9.24%
Opp Debt Excess	-1%	-1.24%	-0.05%	0.16%
Private Debt	10.41%	10.82%	10.98%	11.16%
PD Benchmark	7.08%	7.39%	7.1%	7.2%
PD Excess	3.33%	3.43%	3.88%	3.96%
Farmland & Infrastructure	14.96%	9.75%	NA%	8.2%
Farmland Benchmark	5.68%	5.66%	NA%	5.6%
Farmland Excess	9.28%	4.09%	NA%	2.61%

Value at Risk

TOTAL PORTFOLIO VALUE-AT-RISK (VAR)

As of September, 2018, total VaR for ASRS Portfolio was 11.97%, indicating that there is a 5% chance that portfolio could lose ~$5B in a given year. Note that a 5% event is expected to occur every 20 years



MSCI

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- The asset class committees met on the following days in 2018:

Date	Combined Asset Class Committee	Investment Committee
January 18	X	
February 5, 27	X	
March 16, 23, 27	X	
April 5	X	
April 17		X
May 1, 10, 22	X	
May 22		X
June 19	X	
July 7, 27	X	
August 30	X	
Sept. 6,17,18	X	
Sept. 28		X
Oct. 4, 9, 12 18, 29	X	

IMD Project Status