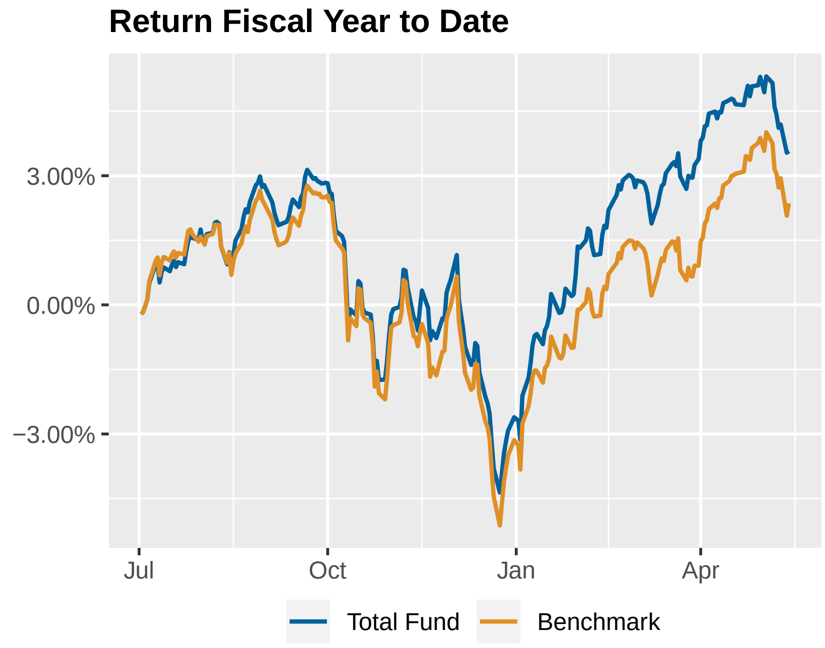
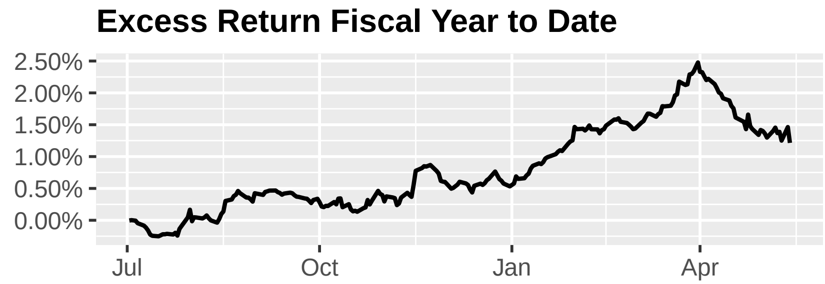
CIO Board Report

Arizona State Retirement System

May 31, 2019

Total Fund Fiscal Year to Date Return & Current Positioning through 05/14/2019





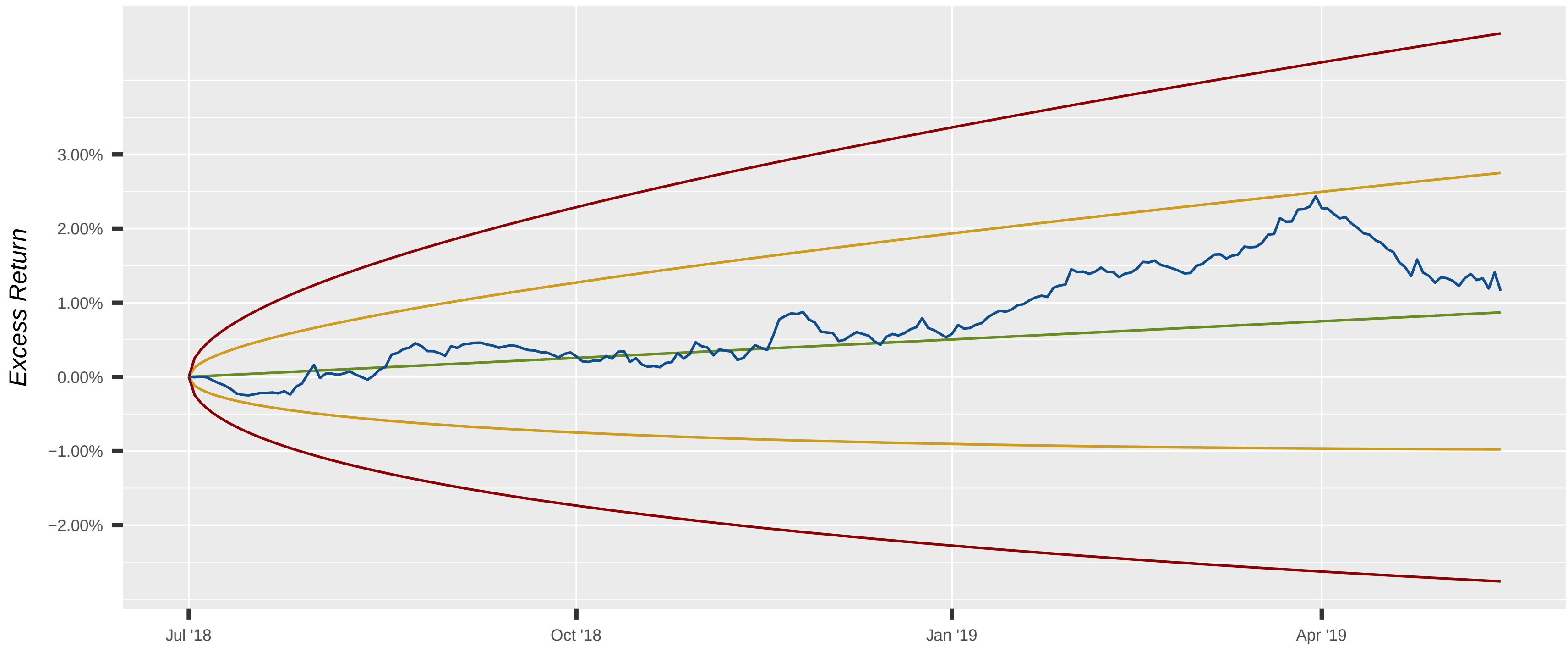
Total Fund Exposure

	NAV w/ Notional ($ mm)	NAV Exposure (%)	Target (%)	Active Weight (%)	Active Weight ($ mm)
Cash	1001.3	2.5	0.0	2.5	1001.3
Bonds	4053.4	10.1	11.6	-1.5	-595.6
Credit	7220.0	18.0	17.4	0.6	246.3
Equity	22218.8	55.4	58.0	-2.6	-1026.6
Real Estate	5490.4	13.7	13.0	0.7	280.2
Other	94.4	0.2	0.0	0.2	94.4
Total Fund	40078.3	100.0	100.0	0.0	0.0

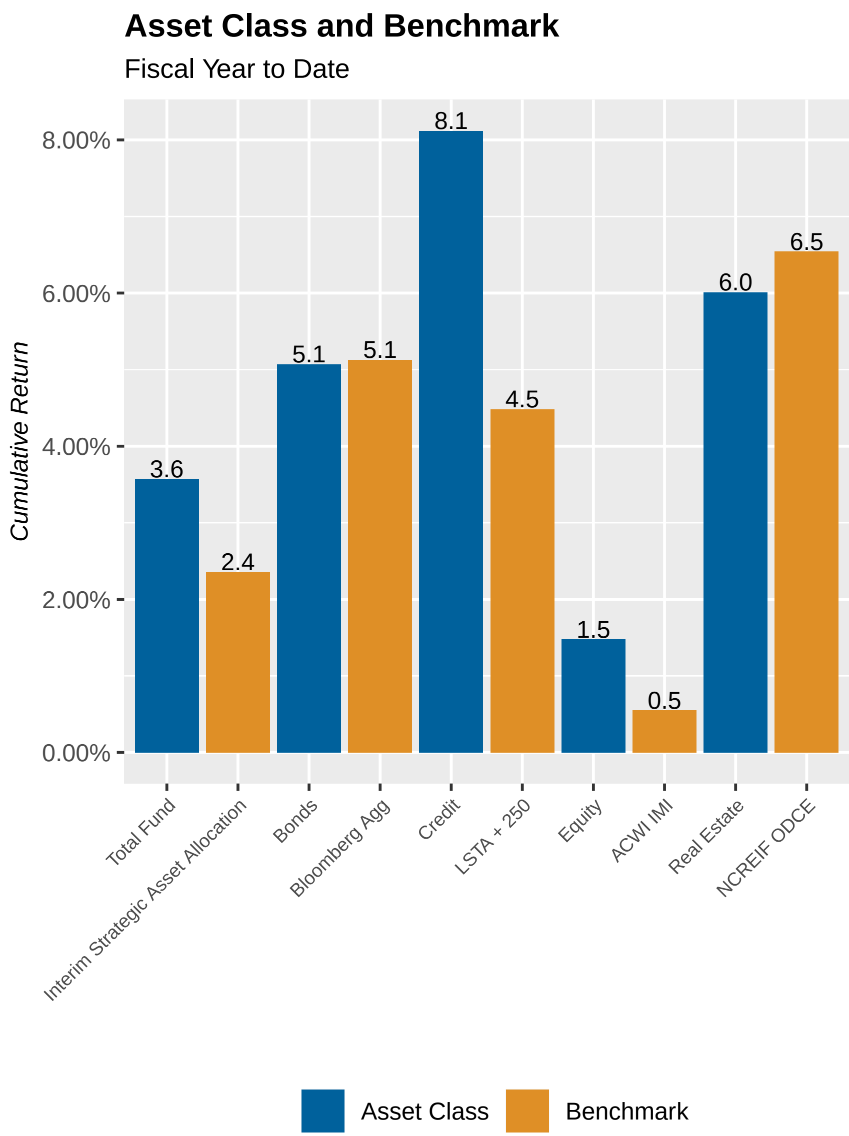
Total Fund Cone Chart through 05/14/2019

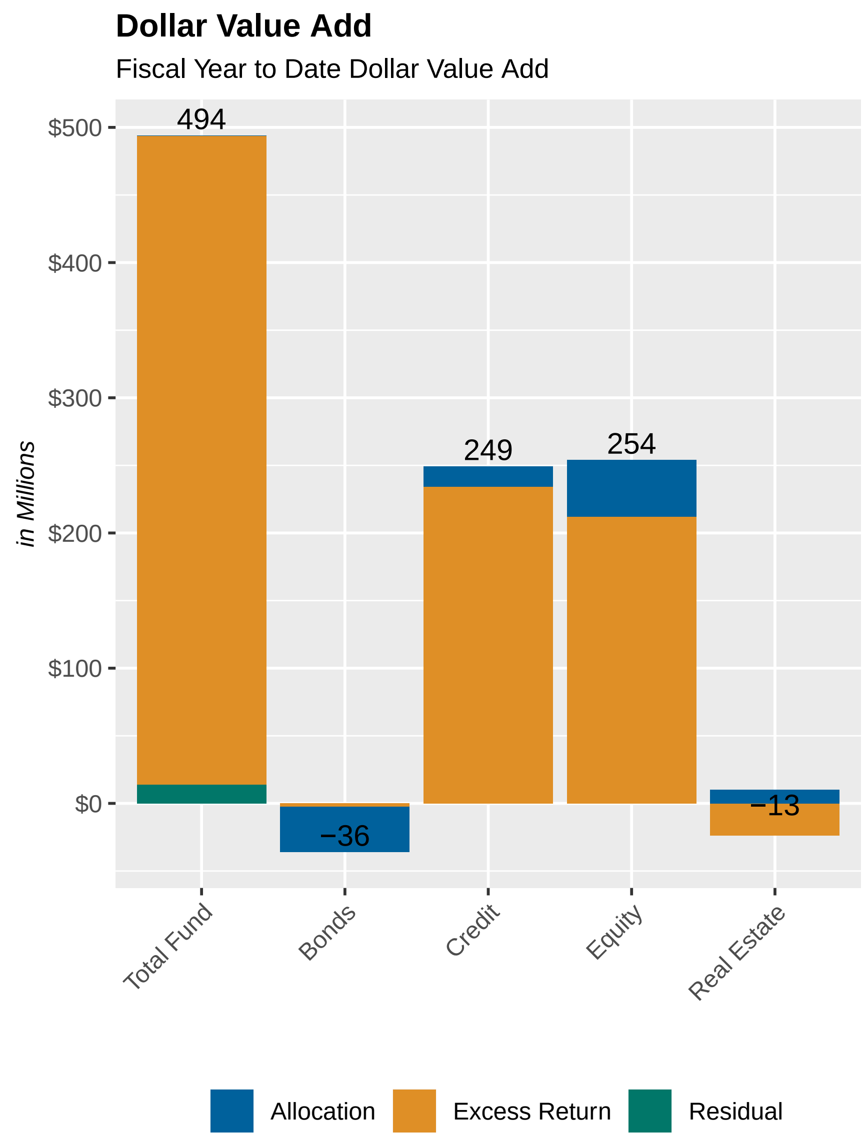
Total Fund Performance versus Expectations

100 Basis Points Expected Excess Return with 200 Basis Points Tracking Error

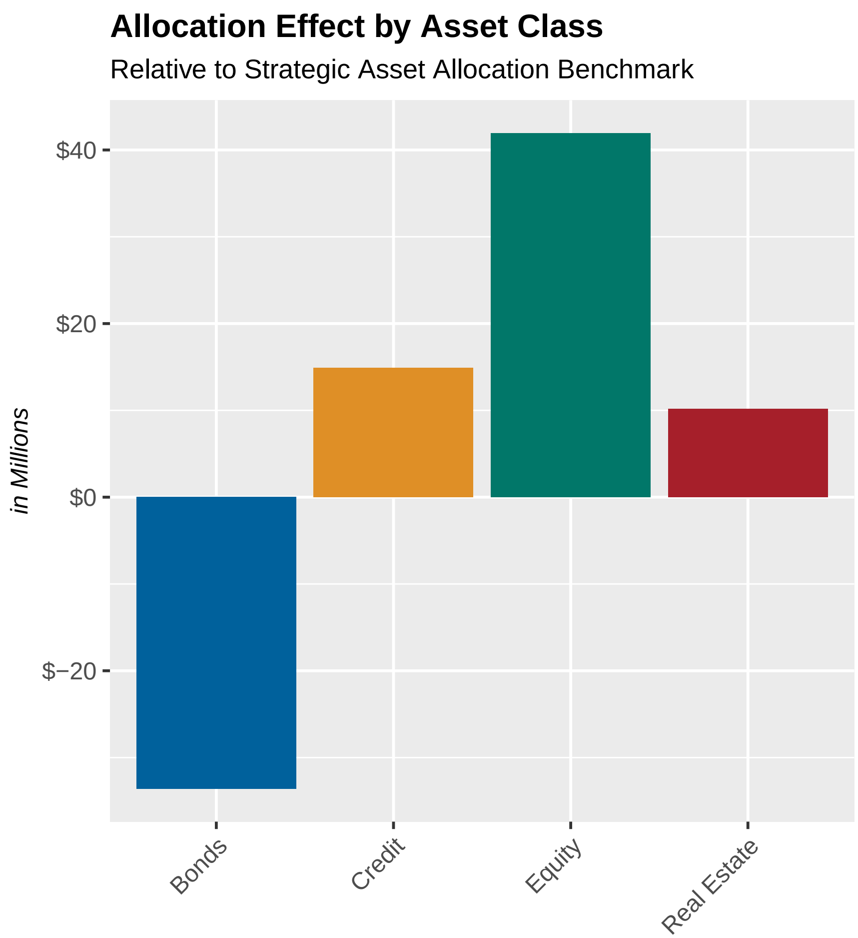


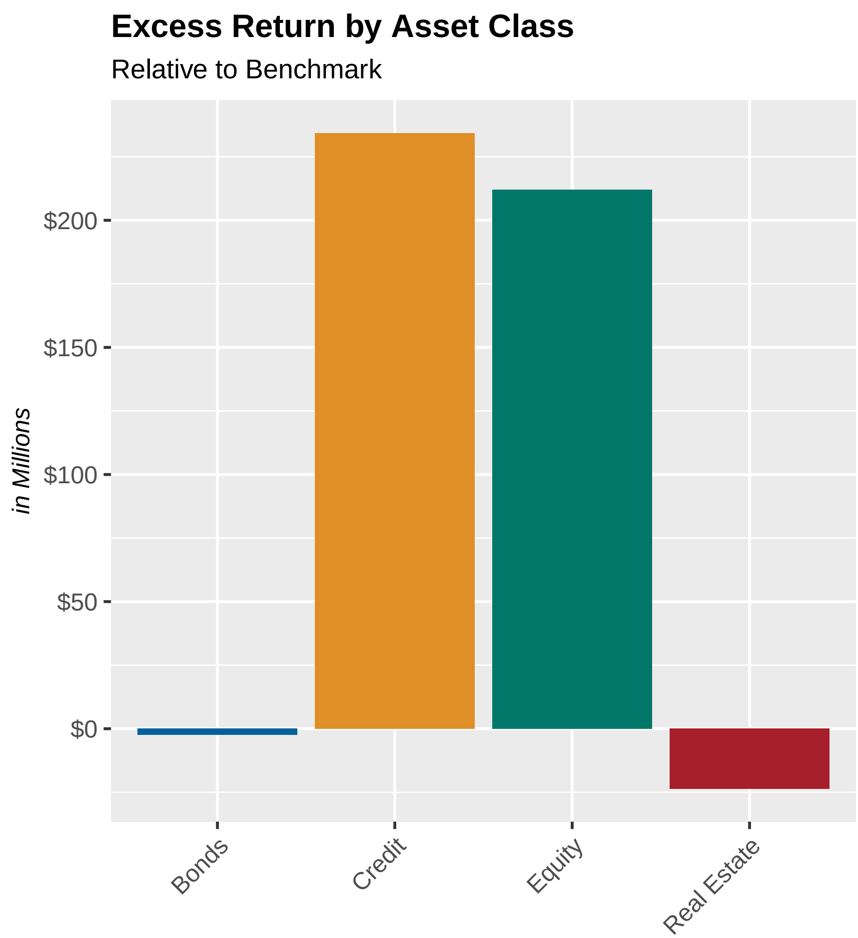
Fiscal Year to Date Total Fund Returns & Dollar Value Add through 05/14/2019





Fiscal Year to Date Allocation Effect and Excess Return by Asset Class through 05/14/2019





Bonds Credit Equity Real Estate

State Street Performance Summary for the period ended 03/31/2019

ASRS Performance Summary

ARIZONA STATE RETIREMENT SYSTEM
Investment Management Division
Mar-31-2019
Net Returns
Final

	Benchmark	Market Value ($mil.)	1 Mth	3 Mth	FYTD	1 Year	3 Year	5 Year	ITD	Inception Date
TOTAL PLAN	**INTERIM SAA POLICY**	**40,253**	**0.64**	**6.16**	**3.39**	**4.74**	**9.28**	**6.80**	**9.64**	**07-01-1975**
Excess			1.03	1.97	2.48	2.98	2.49	2.15	0.45	
TOTAL EQUITY W/PE and Opp	**LEGACY Total Equity BM**	**22,421**	**0.70**	**9.47**	**1.95**	**2.87**	**10.83**	**7.35**	**9.39**	**07-01-2013**
Excess			1.17	2.21	2.53	2.70	0.26	0.48	0.21	
US EQUITY	COMBINED DOMESTIC EQUITY INDEX	10,060	0.85	12.98	3.11	7.17	12.42	9.83	11.18	07-01-1975
Excess			-0.65	-1.19	-1.62	-1.90	-1.22	-0.78	-0.16	
INTERNATIONAL EQUITY	INTERNATIONAL EQUITY INDEX	8,313	0.52	10.08	-2.36	-4.84	7.73	2.71	5.89	04-01-1987
Excess			-0.02	-0.22	0.06	0.21	-0.28	-0.12	0.25	
PRIVATE EQUITY	MSCI ACWI IMI w/USA GROSS (NET) LAGGED	4,047	0.74	0.23	9.58	11.85	14.24	11.83	7.39	09-01-2007
Excess			7.95							
INTEREST RATE SENSITIVE	**BBG BARC Agg (Dly)**	**4,035**	**1.86**	**2.92**	**4.60**	**4.47**	**2.27**	**3.03**	**7.84**	**07-01-1975**
Excess			-0.06	-0.03	-0.05	-0.01	0.24	0.29		
CREDIT	**LEGACY Total Credit BM**	**7,003**	**-0.05**	**1.49**	**6.64**	**9.30**	**9.99**	**7.31**	**7.39**	**07-01-2013**
Excess			2.30	4.35	5.78	6.52	2.34	3.54		
PRIVATE DEBT	S&P LEVERAGED LOAN INDEX LAGGED + 250BPS	5,097	0.76	2.05	7.22	10.80	10.99	10.47	12.02	10-01-2012
Excess			3.11	4.91	6.36	7.85	3.56	4.85	5.51	
DISTRESSED DEBT	S&P LEVERAGED LOAN INDEX LAGGED + 250BPS	1,636	-0.75	1.97	6.54				6.54	07-01-2018
Excess			1.59	4.83	5.68				5.68	
OTHER CREDIT	S&P LEVERAGED LOAN INDEX LAGGED + 250BPS	267	-7.50	-7.43	-1.45				-1.45	07-01-2018
Excess			-5.15	-4.57	-2.31				-2.31	
REAL ESTATE	**Custom ASRS ODCE (Net)**	**5,238**	**0.58**	**1.42**	**4.74**	**6.88**	**8.25**	**11.17**	**6.40**	**12-01-2005**
Excess			-0.06	-0.45	-1.04	-0.99	0.81	1.65	-0.17	
CASH	**CASH CUSTOM INDEX**	**1,460**	**0.19**	**4.42**	**0.76**	**1.27**	**5.21**	**2.62**	**4.03**	**04-01-1990**
Excess			-0.04	3.82	-0.91	-0.86	-0.18	-0.80	0.66	
OTHER	**91 DAY TREASURY BILL (DAILY)**	**96**	**0.06**	**7.49**	**-1.09**	**0.19**	**4.56**	**0.40**	**2.69**	**07-01-2013**
Excess			-0.16	6.89	-2.76	-1.93	3.37	-0.34	2.03	

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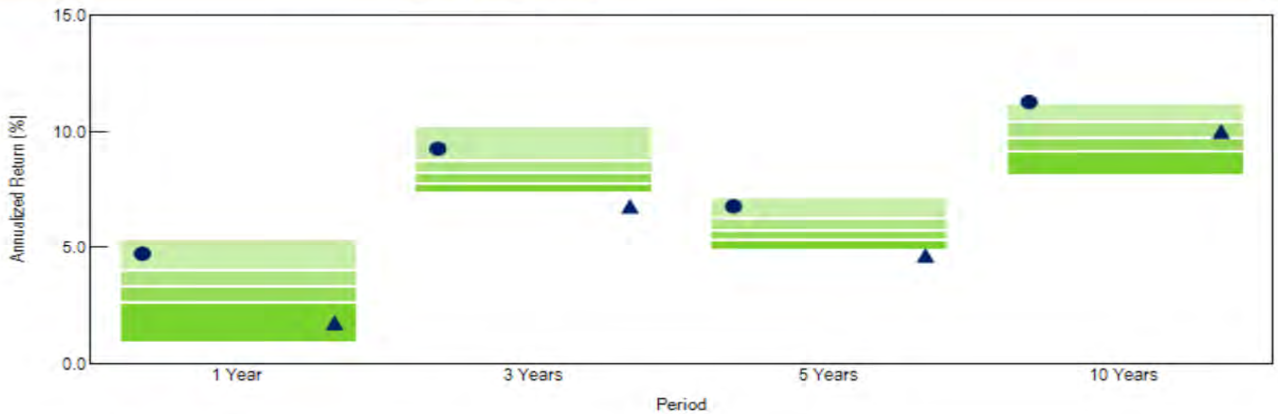
1 of 2

ASRS Returns Compared to Public Fund Universe for the period ended 03/31/2019

UNIVERSE COMPARISON

InvestorForce Public DB > $1B Net Return Comparison
Ending March 31, 2019



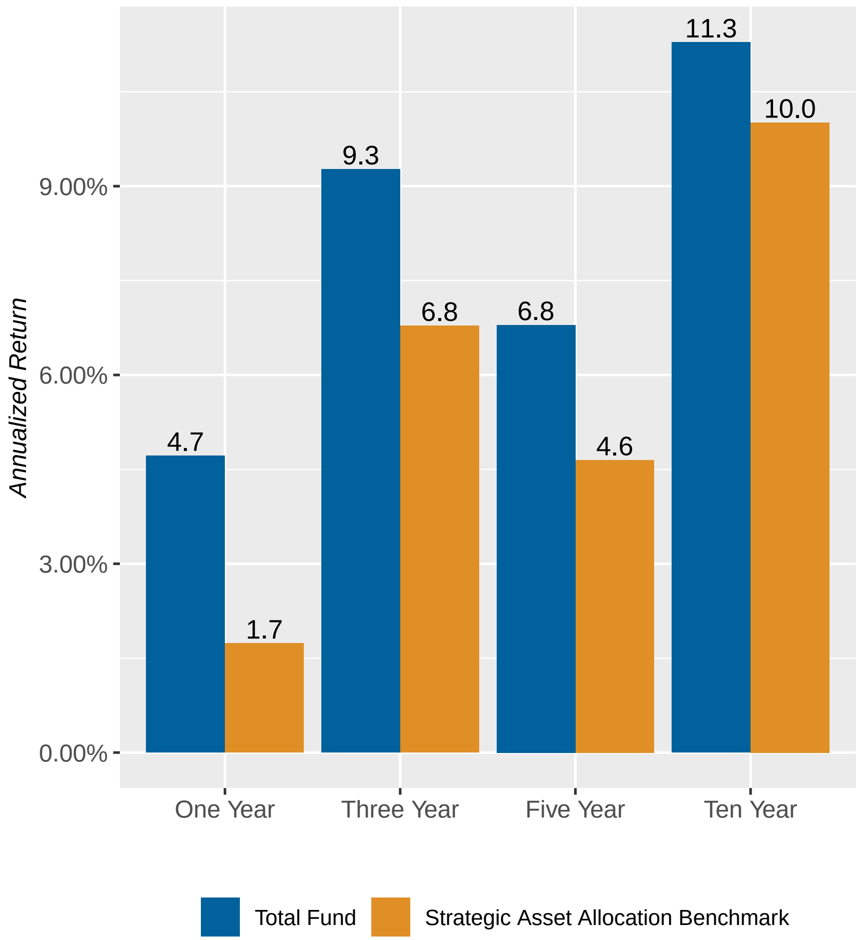
Return (Rank)	1 Year	3 Years	5 Years	10 Years
5th Percentile	5.4	10.2	7.1	11.2
25th Percentile	4.0	8.8	6.3	10.5
Median	3.4	8.3	5.8	9.8
75th Percentile	2.6	7.8	5.4	9.2
95th Percentile	0.9	7.4	4.9	8.1

	1 Year	3 Years	5 Years	10 Years
● Total Fund	4.7	9.3	6.8	11.3
Total Fund Percentile Rank	12	14	12	5
Total Fund Ordinal Rank	9	11	9	3
Number of Funds In Universe	77	77	74	68
▲ Interim SAA Policy	1.8	6.8	4.7	10

Total Fund Returns & Dollar Value Add for the period ended 03/31/2019

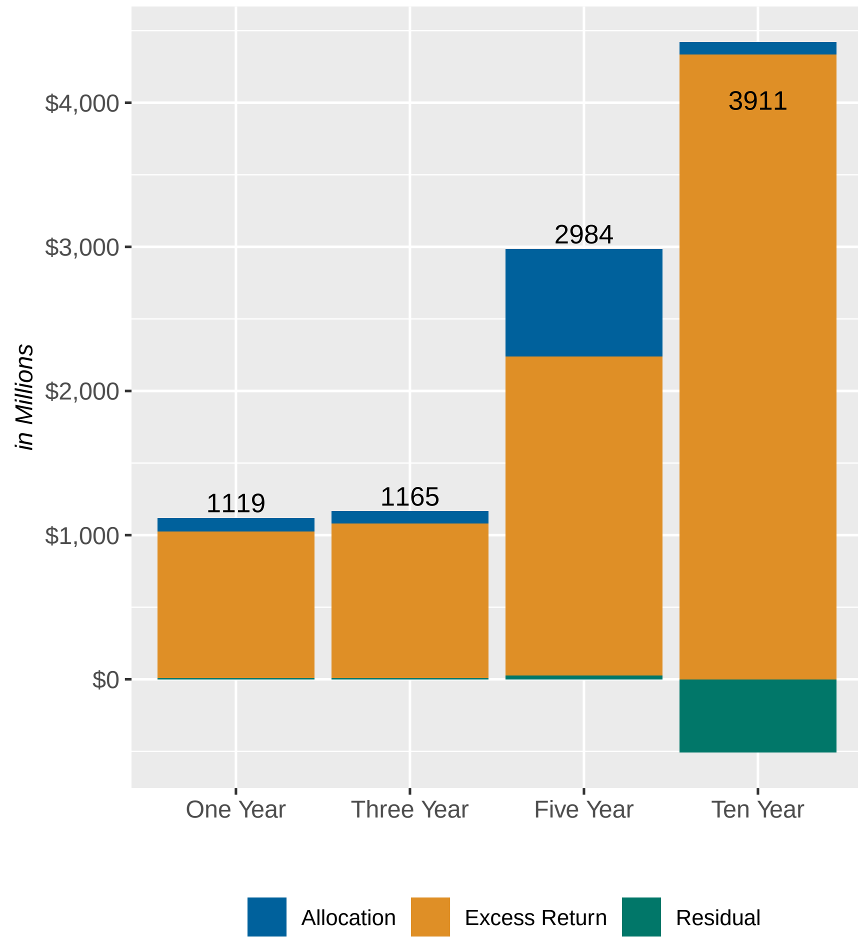
Total Fund and Strategic Asset Allocation Benchmark

Trailing Period Returns

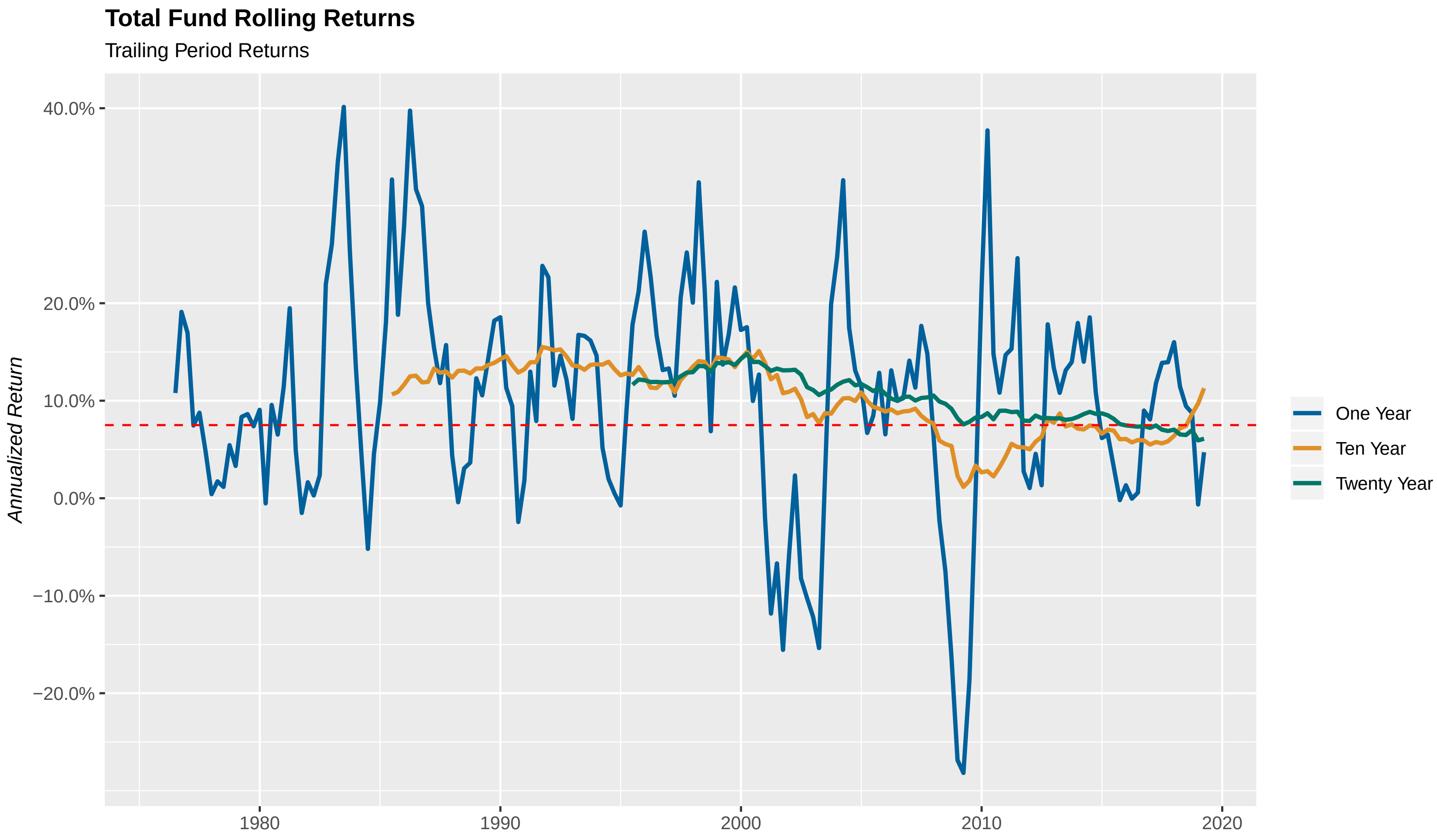


Total Fund Dollar Value Add

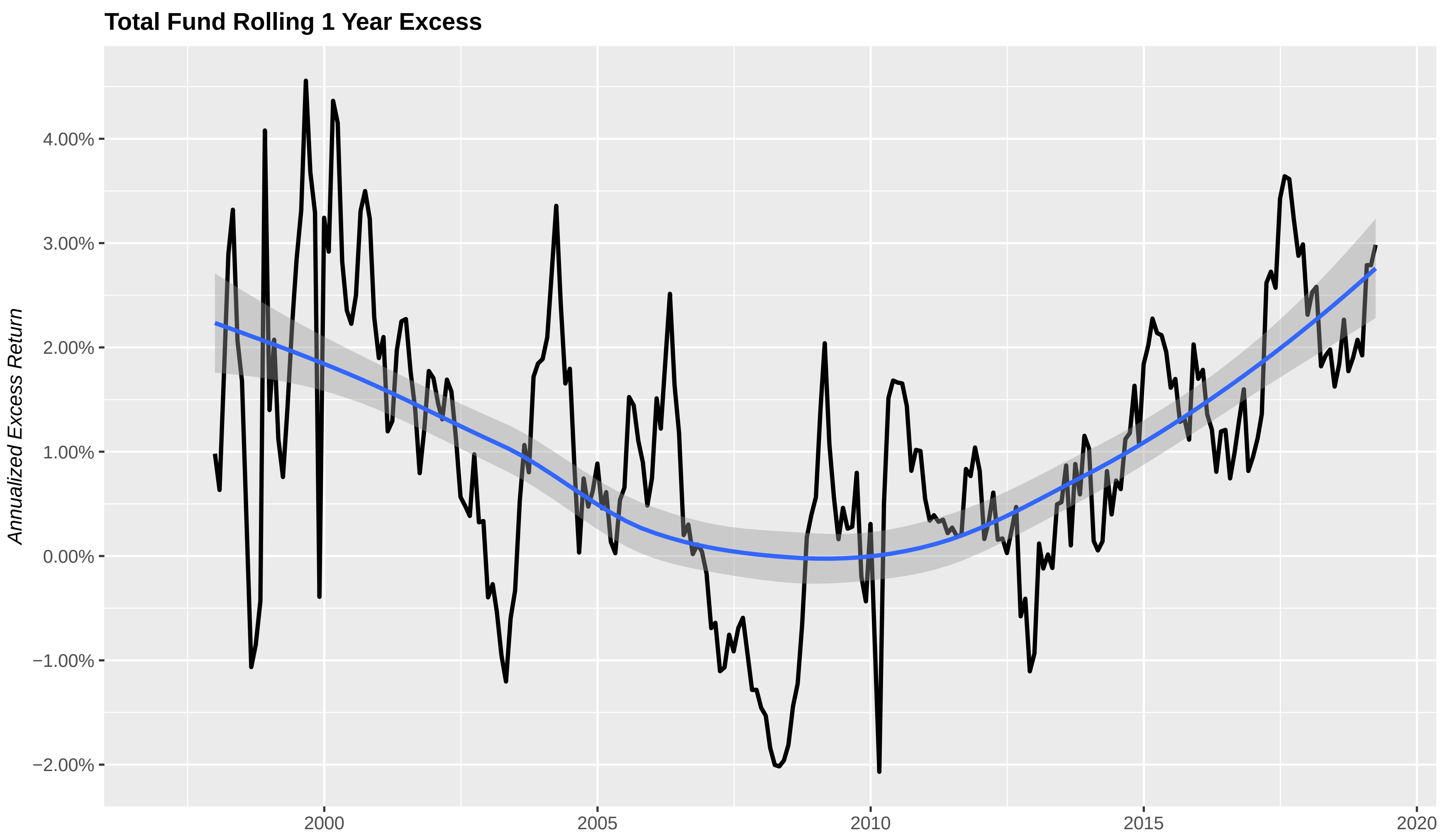
Relative to Strategic Asset Allocation Benchmark



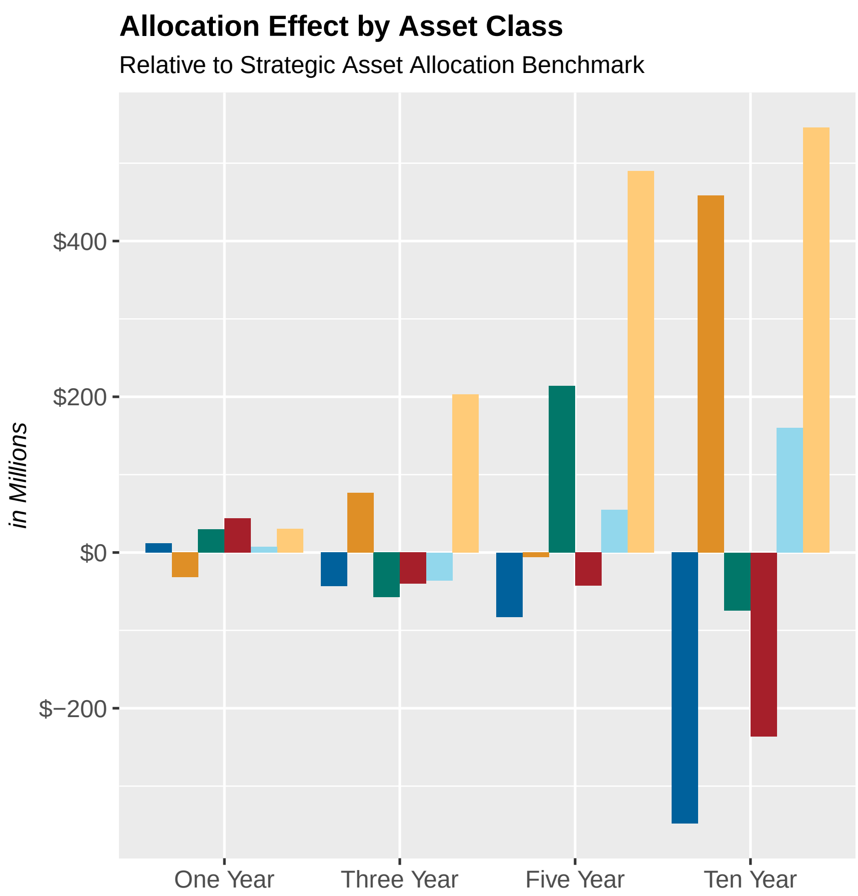
Total Fund Returns for the period ended 03/31/2019

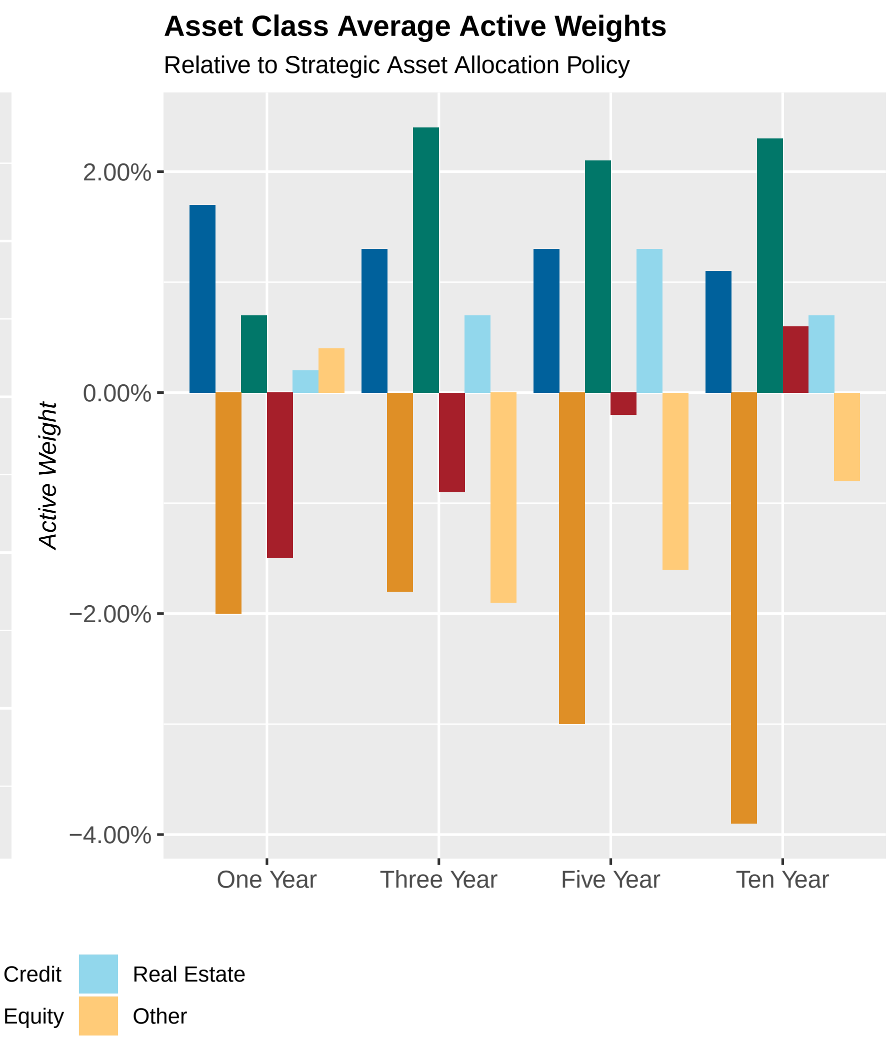


Total Fund Rolling 1 Year Excess Return for the period ended 03/31/2019

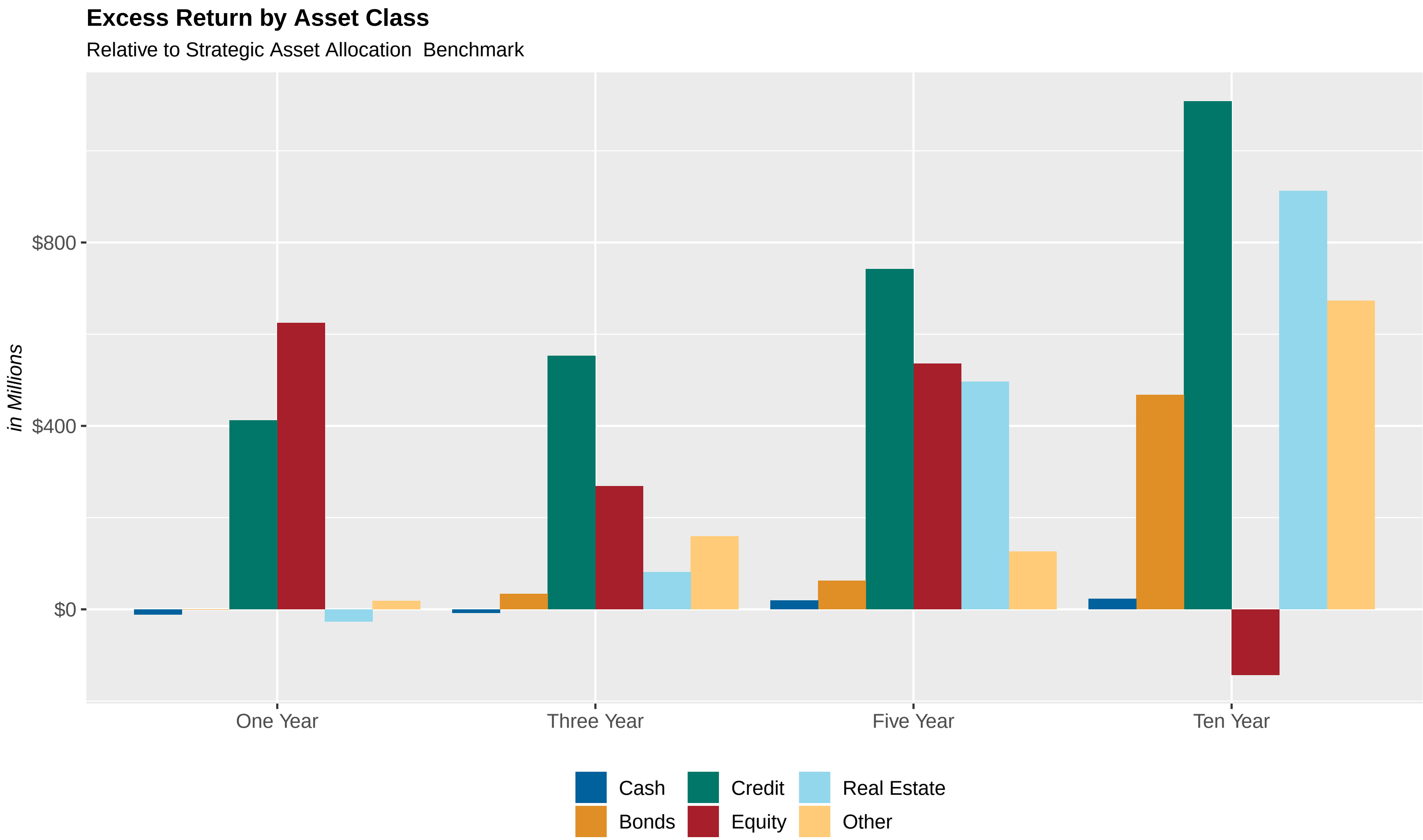


Allocation Effect for the period ended 03/31/2019





Excess Return for the period ended 03/31/2019

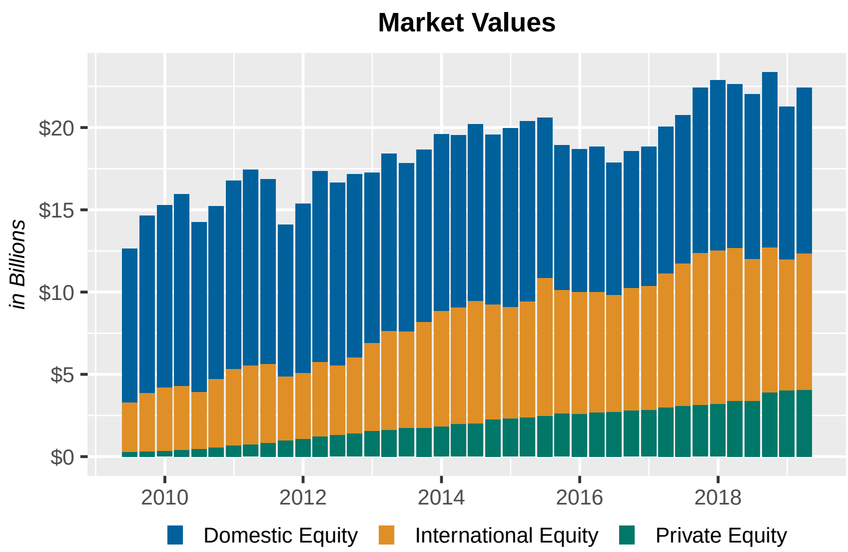


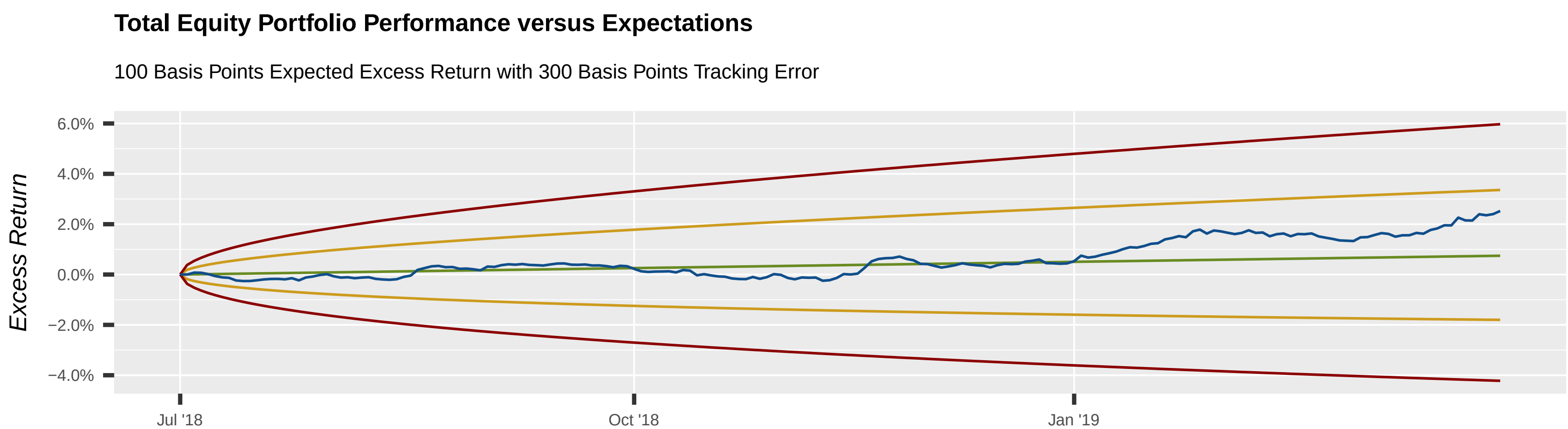
Total Equity for the period ended 03/31/2019

Annualized Returns

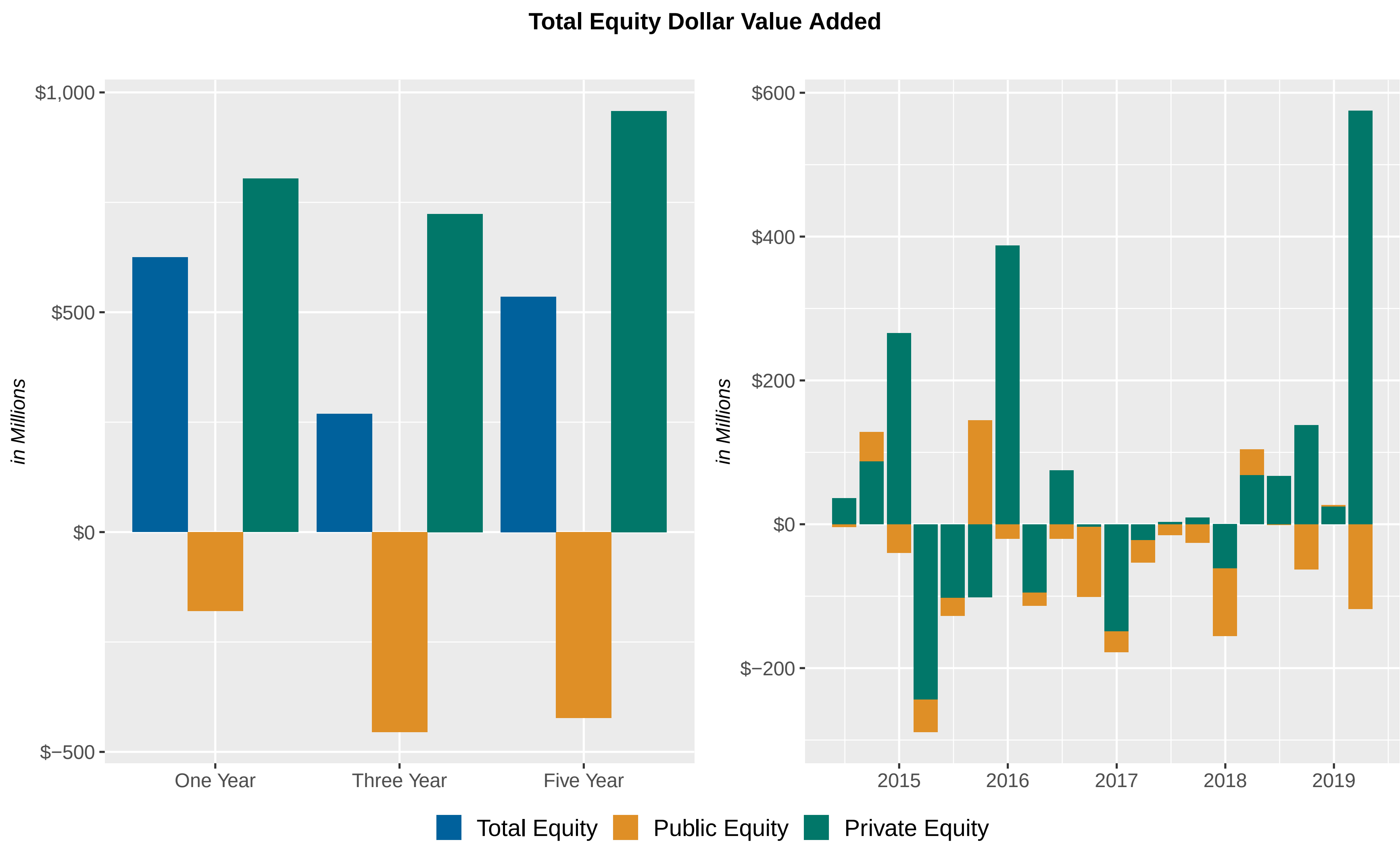
Composite	FYTD	One Year	Three Year	Five Year
Equity	1.93%	2.84%	10.82%	7.34%
Benchmark	-0.61%	0.13%	10.56%	6.86%
Excess	2.54%	2.72%	0.26%	0.49%
Public Equity	0.41%	1.26%	10.15%	6.62%
Benchmark	1.39%	2.26%	11.03%	7.1%
Excess	-0.98%	-1%	-0.88%	-0.48%
US Equity	3.19%	7.26%	12.45%	9.85%
Benchmark	4.73%	9.07%	13.64%	10.61%
Excess	-1.54%	-1.81%	-1.19%	-0.76%
International Equity	-2.44%	-4.92%	7.7%	2.69%
Benchmark	-2.42%	-5.05%	8.01%	2.83%
Excess	-0.03%	0.13%	-0.31%	-0.14%
Private Equity	-0.5%	10.73%	14.07%	11.6%
Benchmark	-13.37%	-10.13%	7.76%	4.79%
Excess	12.86%	20.86%	6.31%	6.81%

Note: Private Equity Returns are reported on a quarter-lagged basis height

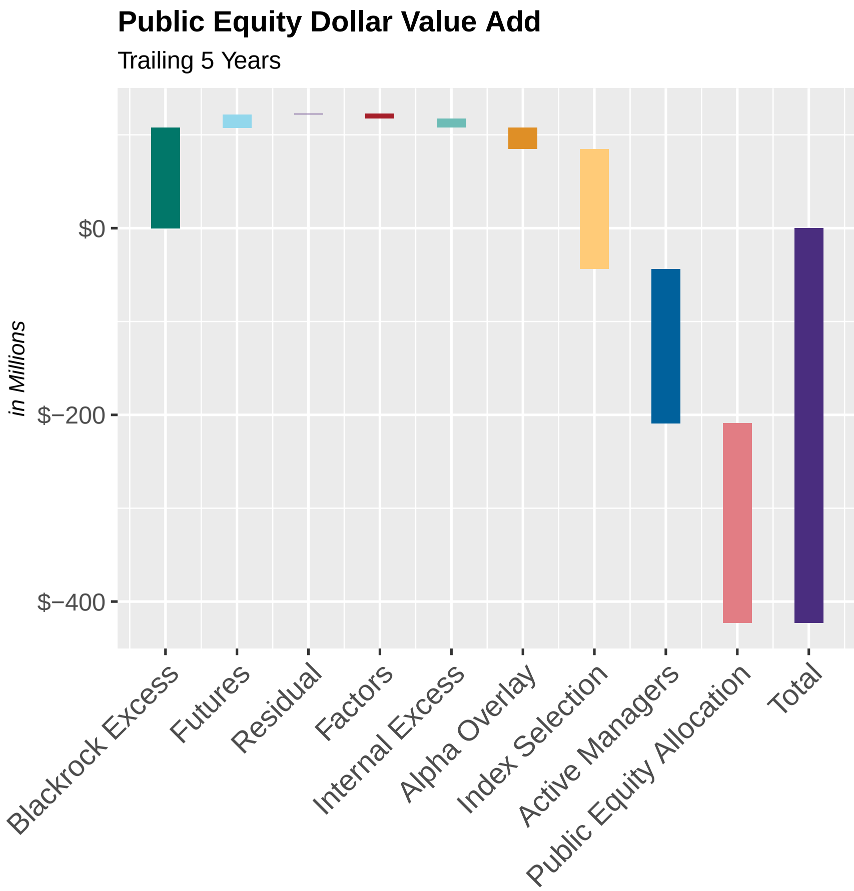


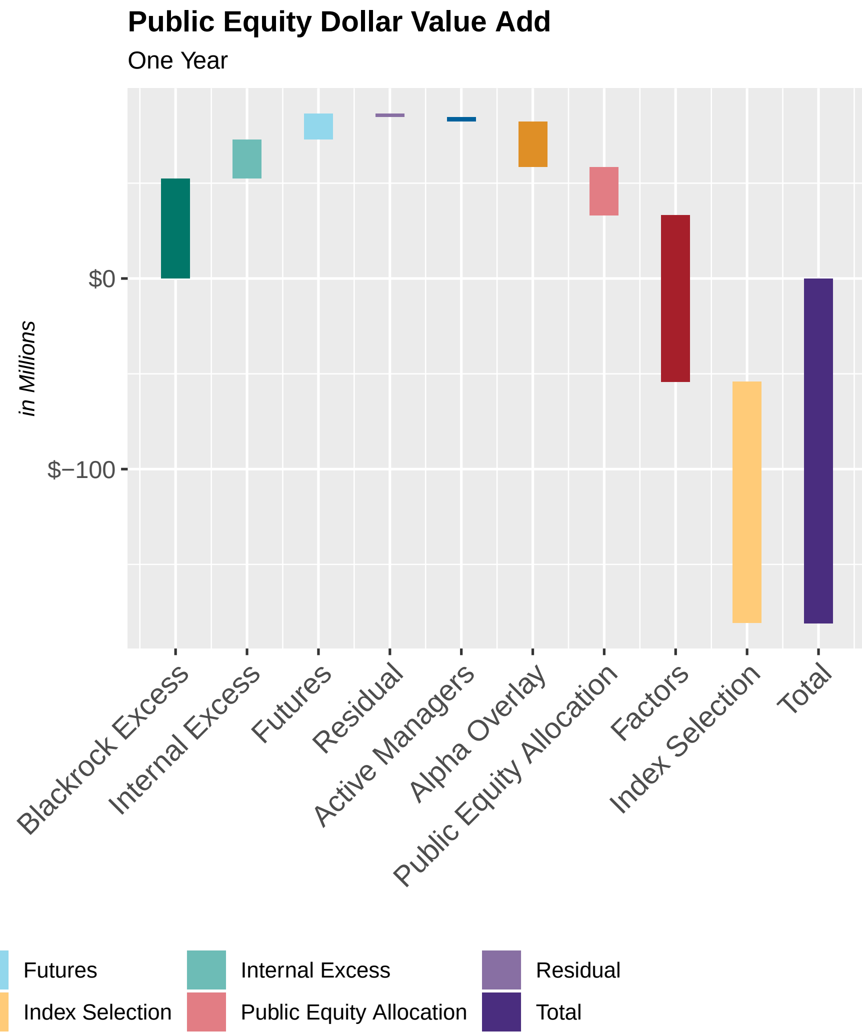


Total Equity & Dollar Value Add for the period ended 03/31/2019



Public Equity "Levers" for the period ended 03/31/2019



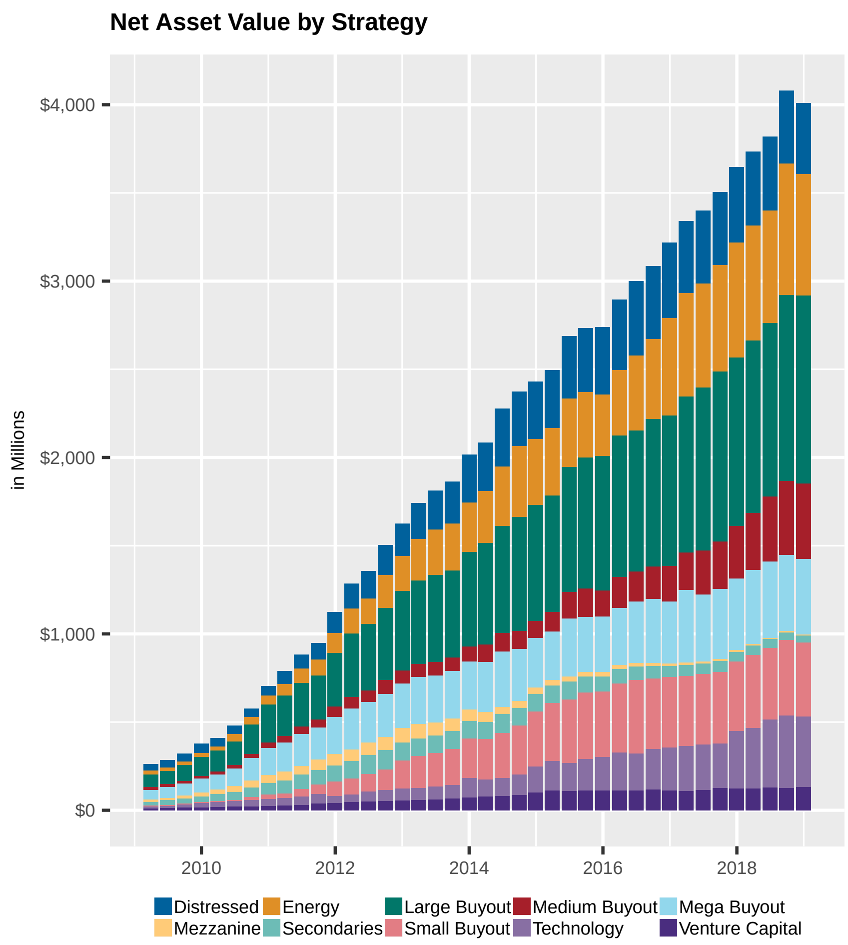


Private Equity for the period ended 12/31/2018

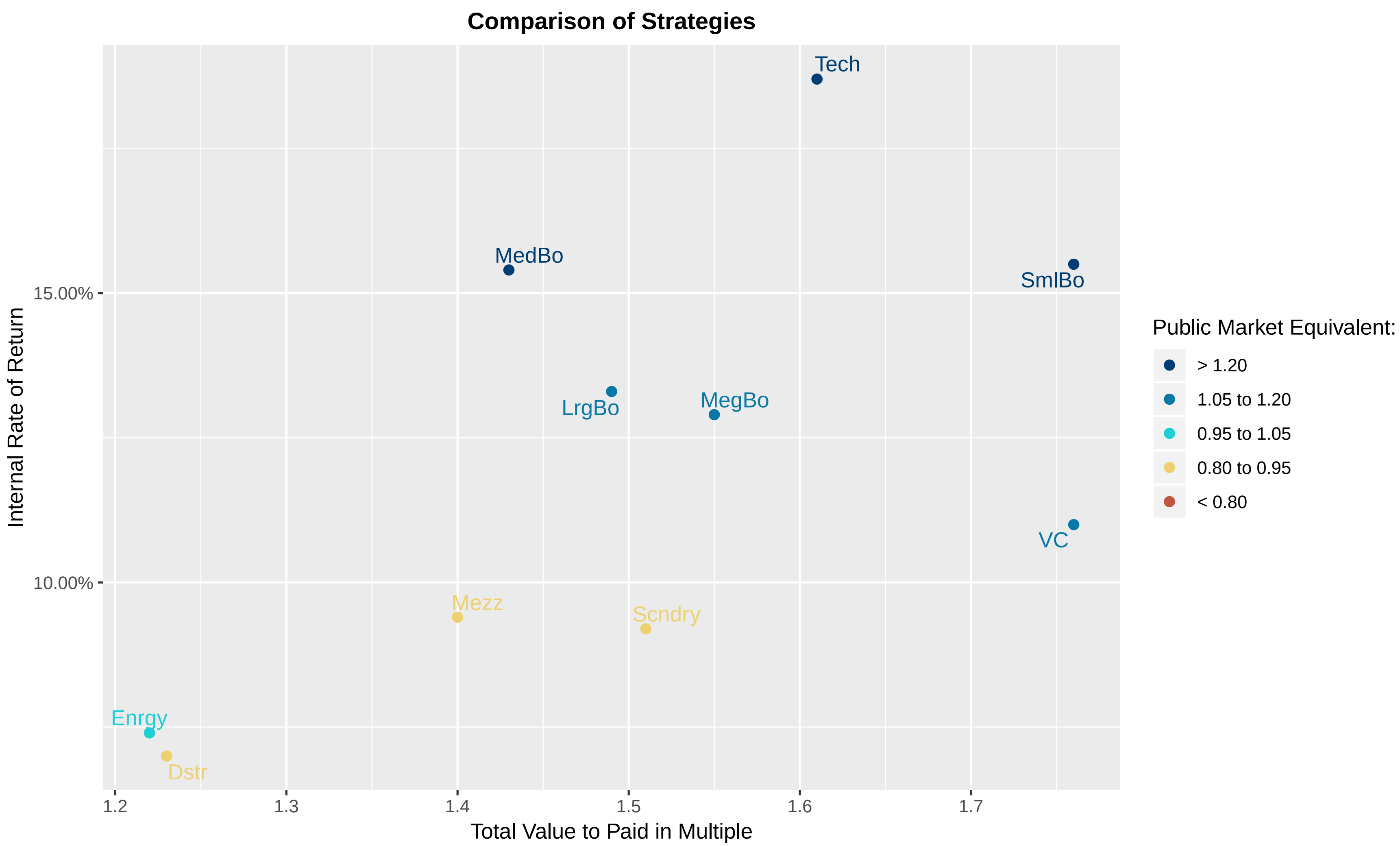
Private Equity Internal Rate of Returns

Category	Quarter	1 Year	3 Year	5 Year	Inception
Private Equity	-0.5%	10.7%	14.1%	11.6%	12.2%
Benchmark	-13.4%	-10.1%	7.8%	4.8%	9.8%
Excess	12.9%	20.9%	6.3%	6.8%	2.3%
Distressed	-4.7%	-3.2%	3.7%	3.6%	7%
Mega Buyout	-3.6%	8.7%	17.3%	13.6%	12.9%
Small Buyout	8%	30.9%	20.8%	19%	15.6%
Energy	-7.7%	-0.4%	11.8%	4.2%	7.4%
Large Buyout	0.7%	10.3%	14.7%	12.2%	13.3%
Medium Buyout	4.2%	17.8%	16%	18.8%	15.3%
Mezzanine	-11.7%	-3.3%	7.9%	8.3%	9.4%
Secondaries	-1.2%	1.9%	5.6%	6.3%	9.2%
Technology	3.3%	25.6%	19.2%	19.8%	18.7%
Venture Capital	3.3%	12.2%	12.3%	13.3%	11%

Note: Private Equity Returns are reported on a quarter-lagged basis height



Private Equity for the period ended 12/31/2018

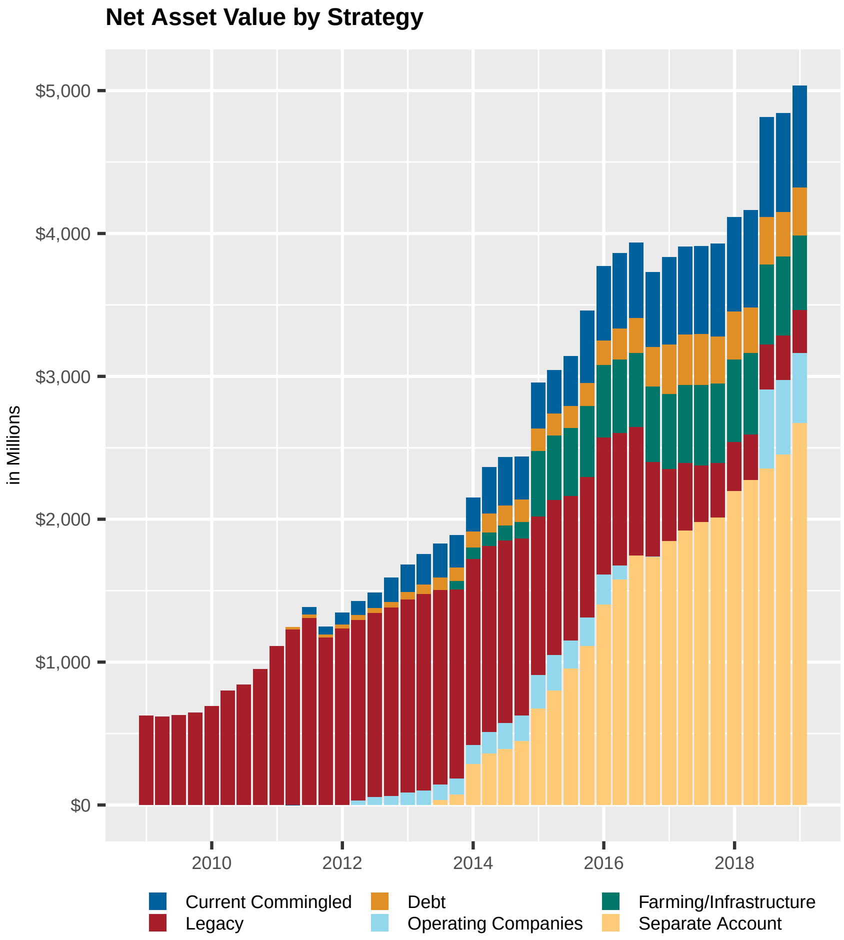


Real Estate for the period ended 12/31/2018

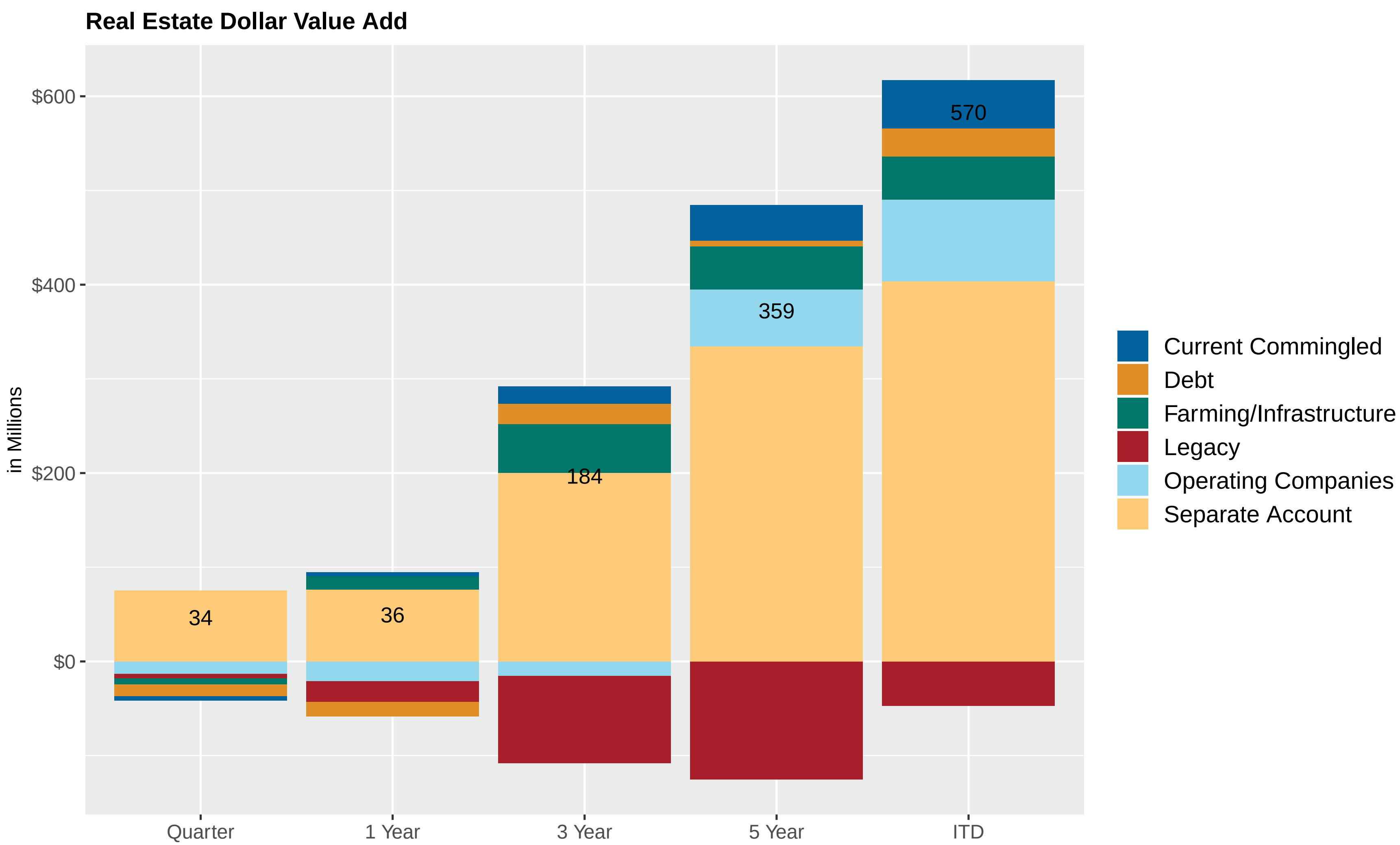
Real Estate Internal Rate of Returns

Category	Quarter	1 Year	3 Year	5 Year	Inception
Real Estate	2.21%	8.1%	8.9%	10.8%	8.8%
Benchmark	1.53%	7.3%	7.5%	9%	7.1%
Excess	0.68%	0.8%	1.4%	1.8%	1.6%
Separate Account	4.58%	11.3%	11.4%	13.3%	14.2%
Operating Companies	-1.06%	1%	3.5%	15.9%	17%
Farming/Infrastructure	0.3%	9.8%	9.1%	7.7%	7.7%
Legacy	0.02%	0.5%	2.8%	8.3%	5.8%
Current Commingled	0.87%	8%	8.6%	10.8%	11.3%
Debt	-2.39%	2.5%	10%	9.6%	11.7%

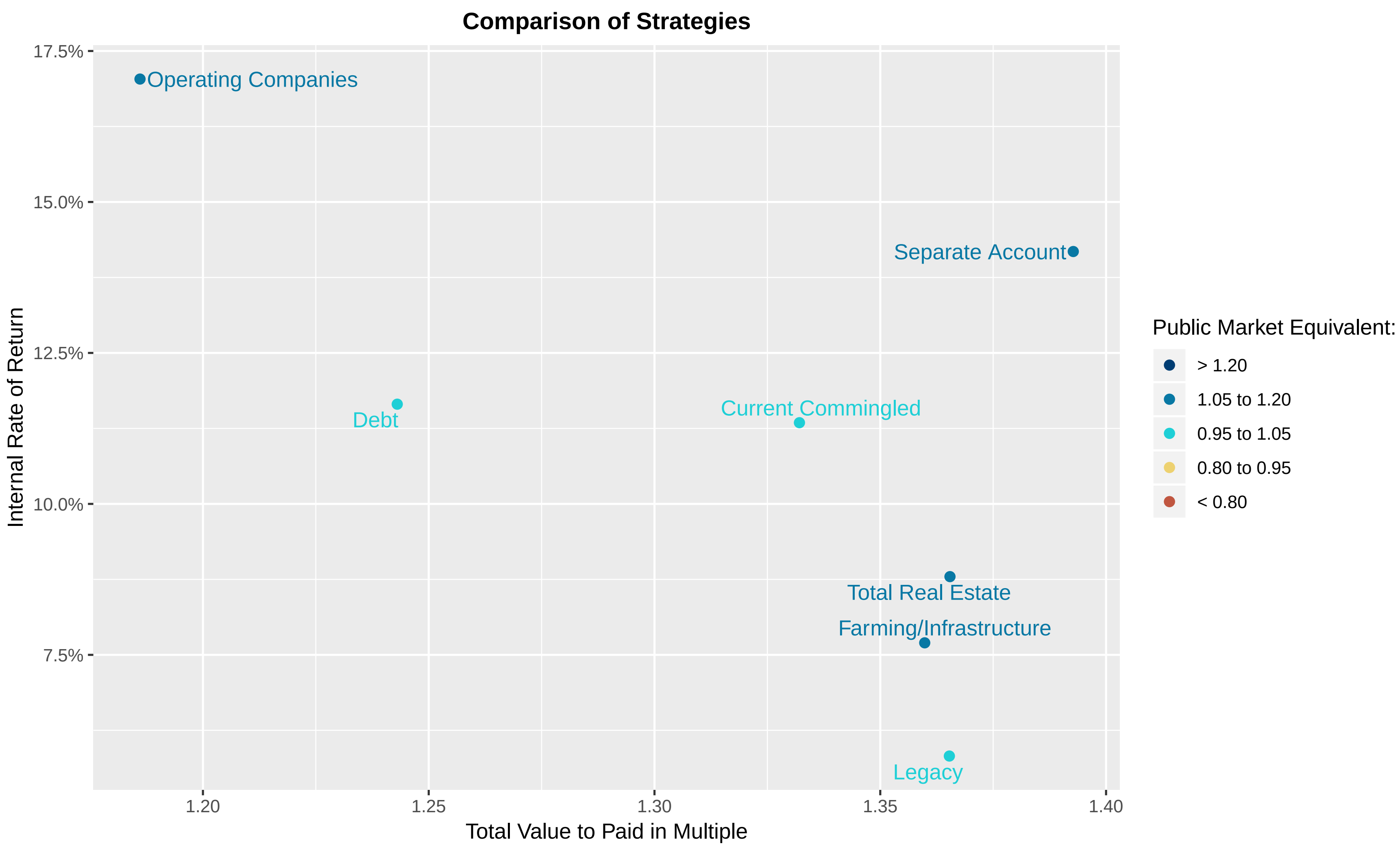
Note: Real Estate Returns are reported on a quarter-lagged basis height



Real Estate Dollar Value Add for the period ended 12/31/2018



Real Estate Strategy Comparison for the period ended 12/31/2018

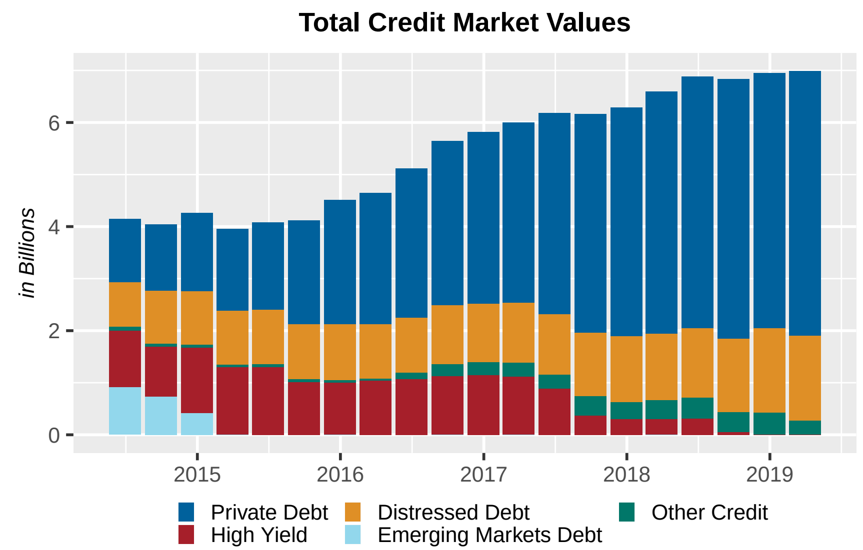


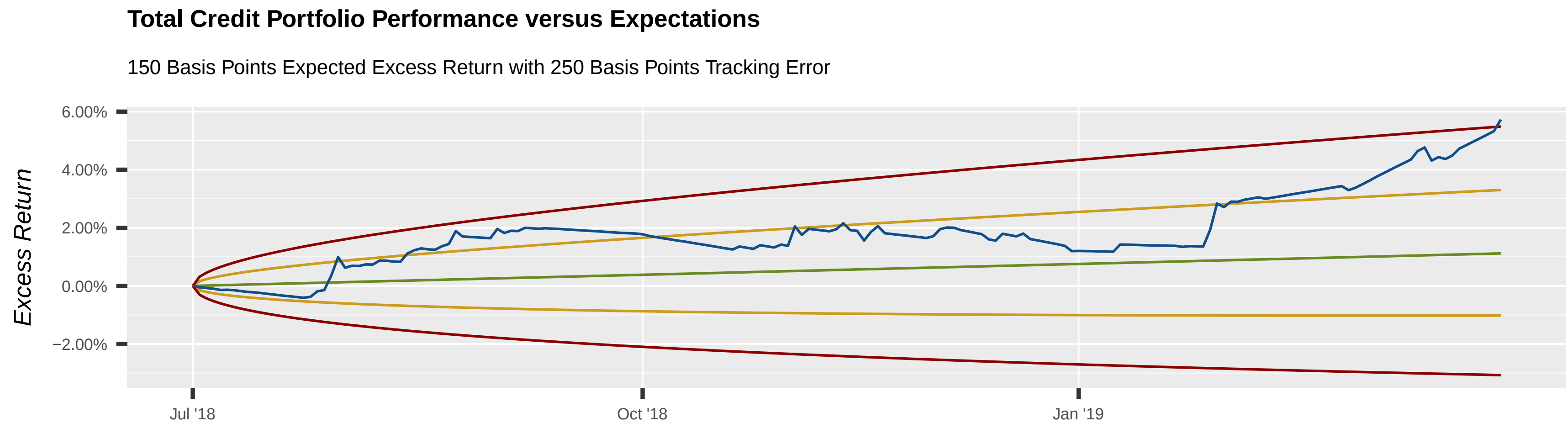
Total Credit for the period ended 03/31/2019

Annualized Returns

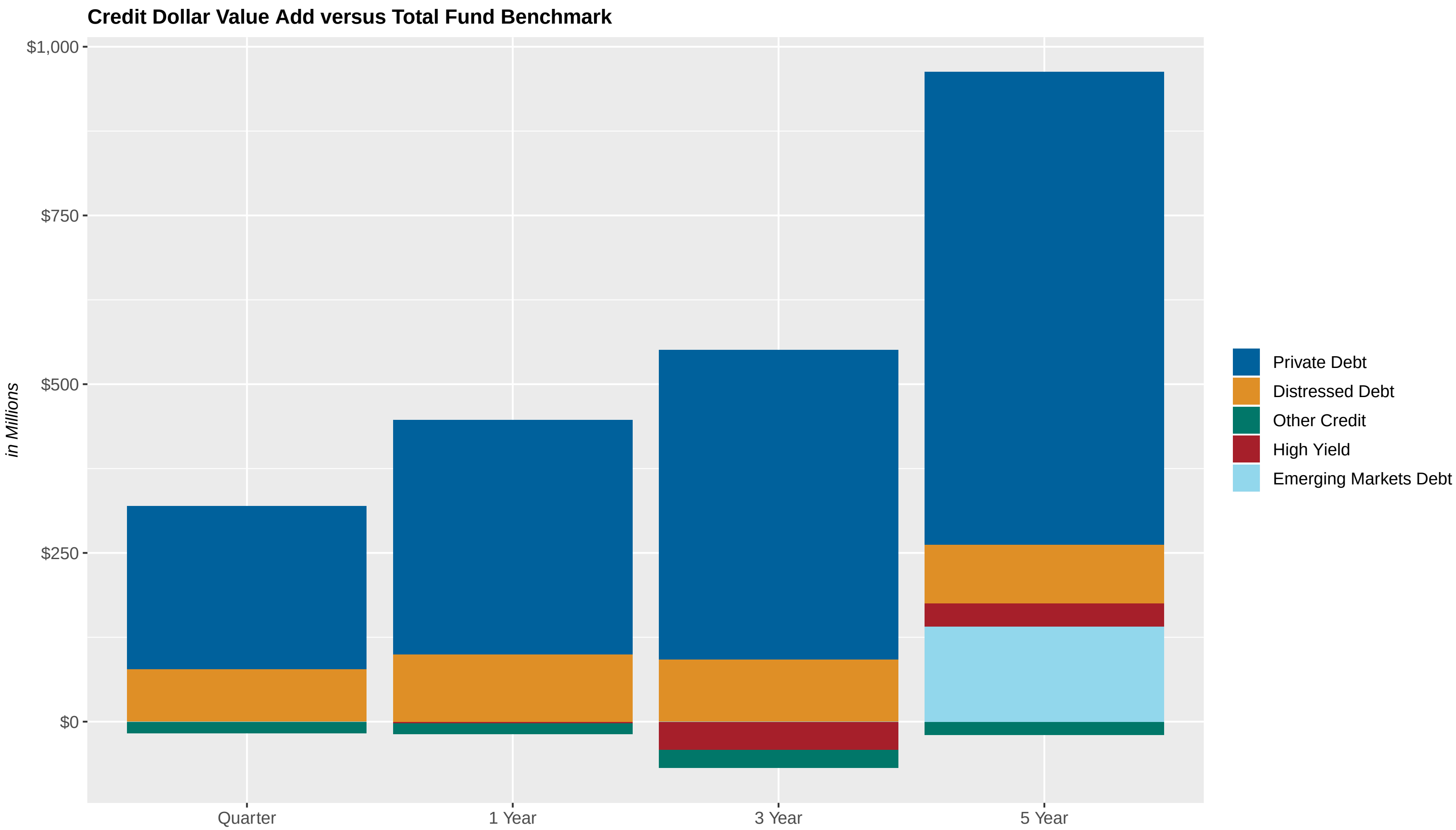
	1 Year	3 Year	5 Year
Total Credit	9.31	9.99	7.31
Blended Benchmark	2.79	7.65	3.77
Total Credit Excess	6.52	2.34	3.54
Private Debt	10.80	10.99	10.47
S&P/LSTA Leveraged Loan + 250 Basis Points	2.95	7.44	5.62
Private Debt Excess	7.85	3.56	4.85
Distressed Debt	7.58	9.76	6.55
Fixed 8% Return/LSTA Blend	2.20	5.97	6.72
Distressed Debt Excess	5.39	3.79	-0.16
Other Credit	0.20	4.95	6.55
Fixed 8% Return/LSTA Blend	2.46	5.44	6.72
Other Credit Excess	-2.26	-0.49	-0.16
High Yield	-10.19	1.63	1.43
Barclay's High Yield Index	5.93	8.56	4.68
High Yield Excess	-16.12	-6.93	-3.25

Note: Private, Distressed and Other Credit are reported a quarter-lagged basis



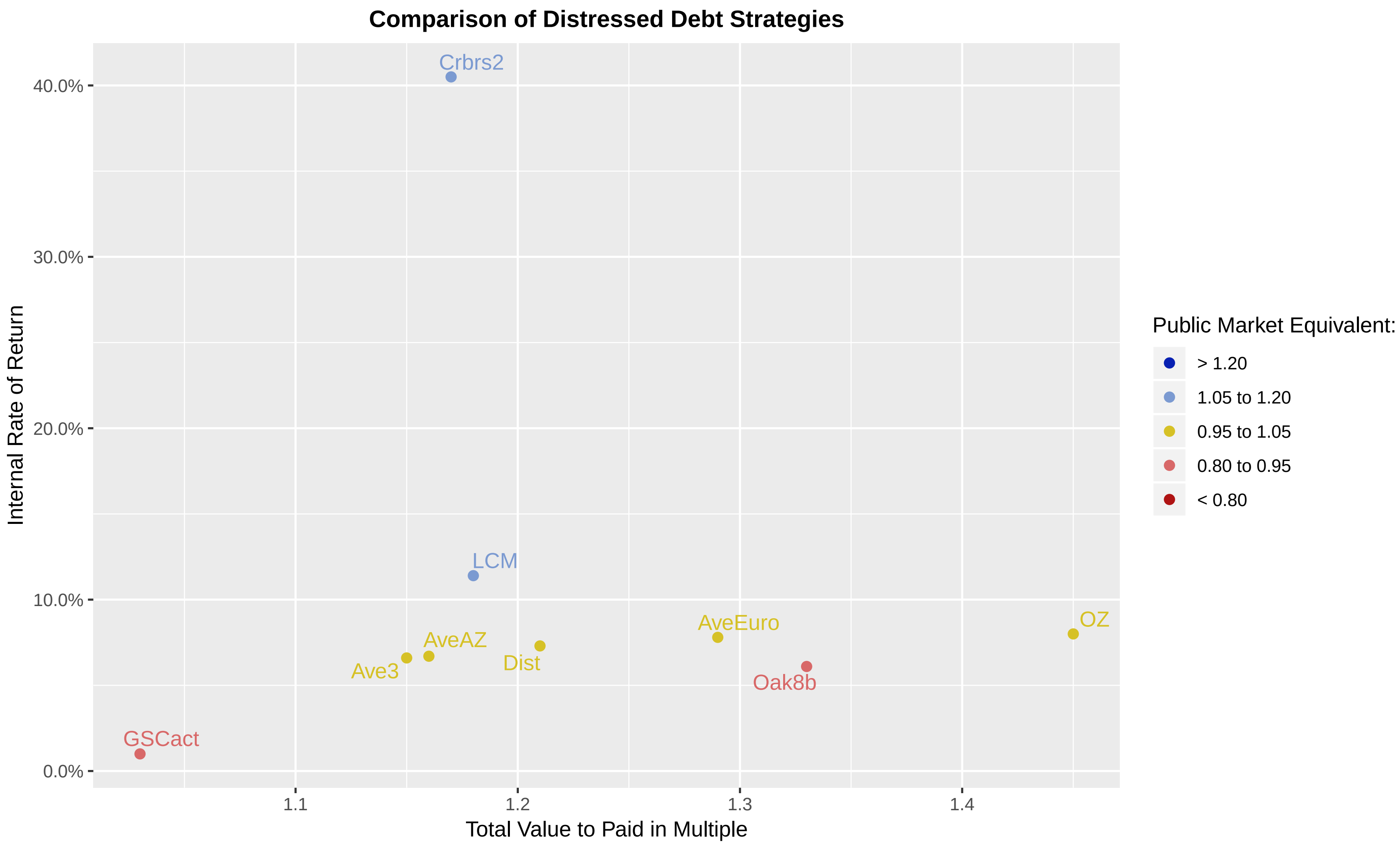


Credit Dollar Value Added for the period ended 03/31/2019

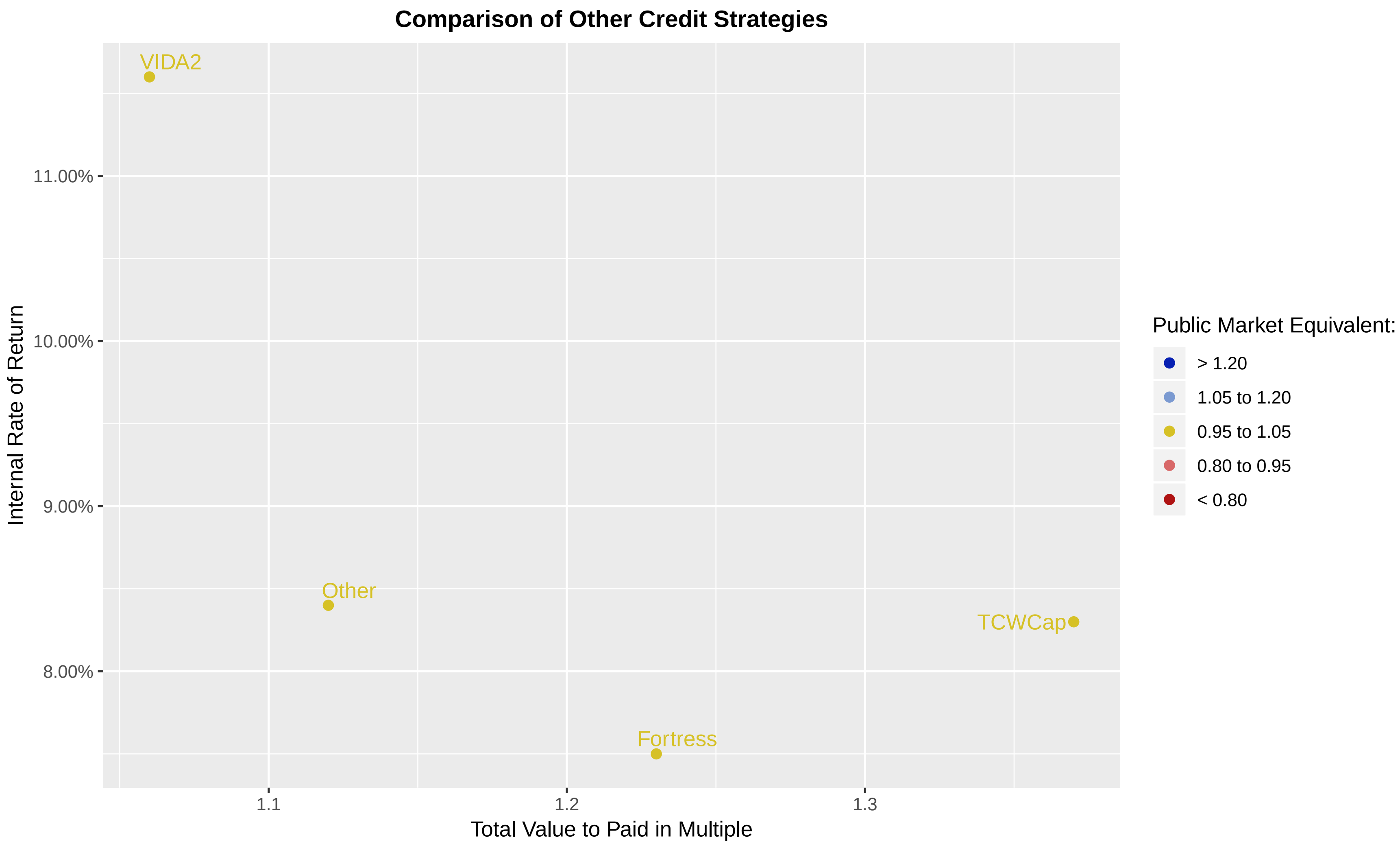


Private Debt: Total Value to Paid in Multiple & Public Market Equivalent for the period ended 12/31/2018

Distressed Debt: Total Value to Paid in Multiple & Public Market Equivalent for the period ended 12/31/2018



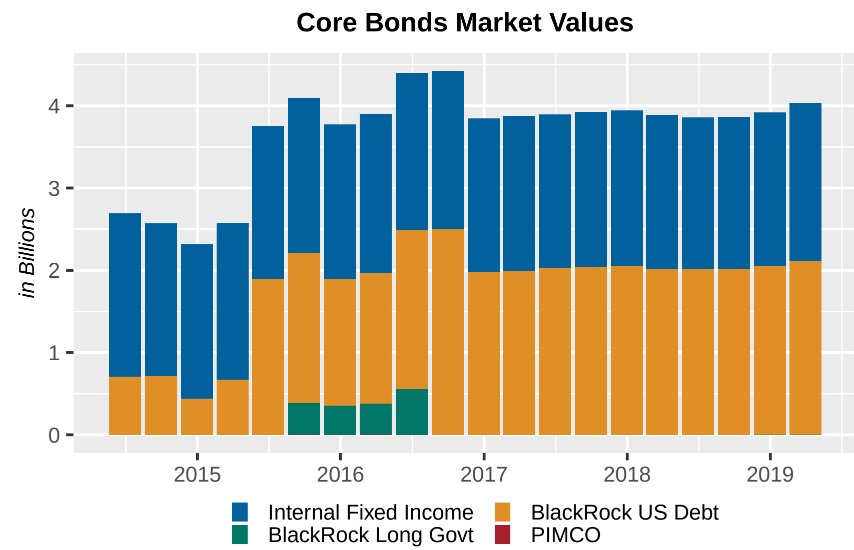
Other Credit: Total Value to Paid in Multiple & Public Market Equivalent for the period ended 12/31/2018

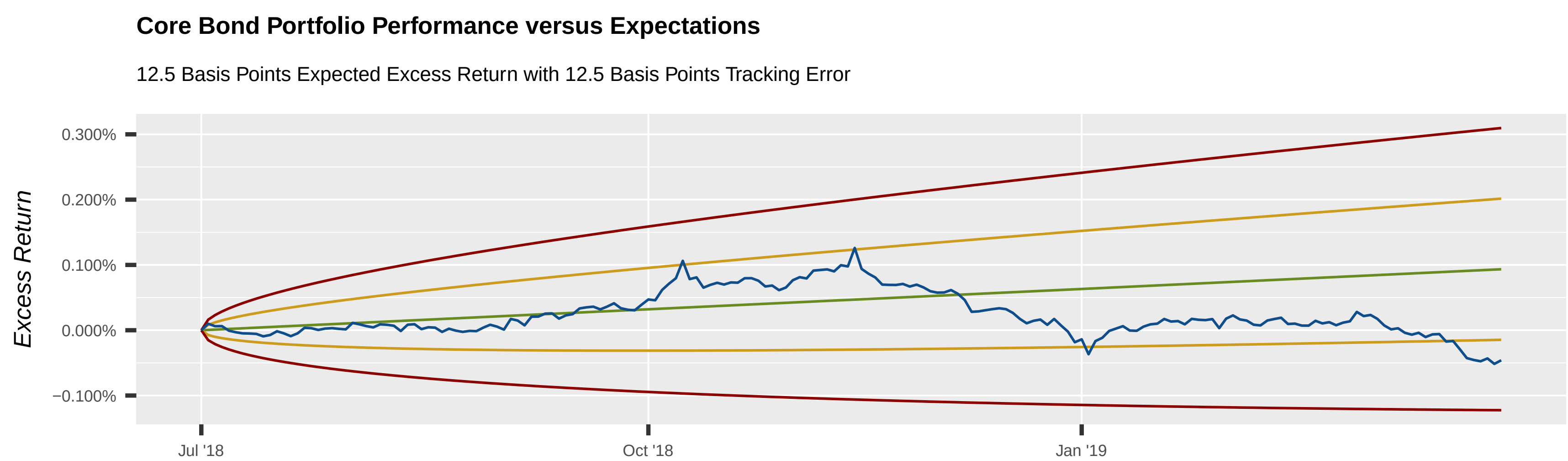


Core Fixed Income for the period ended 03/31/2019

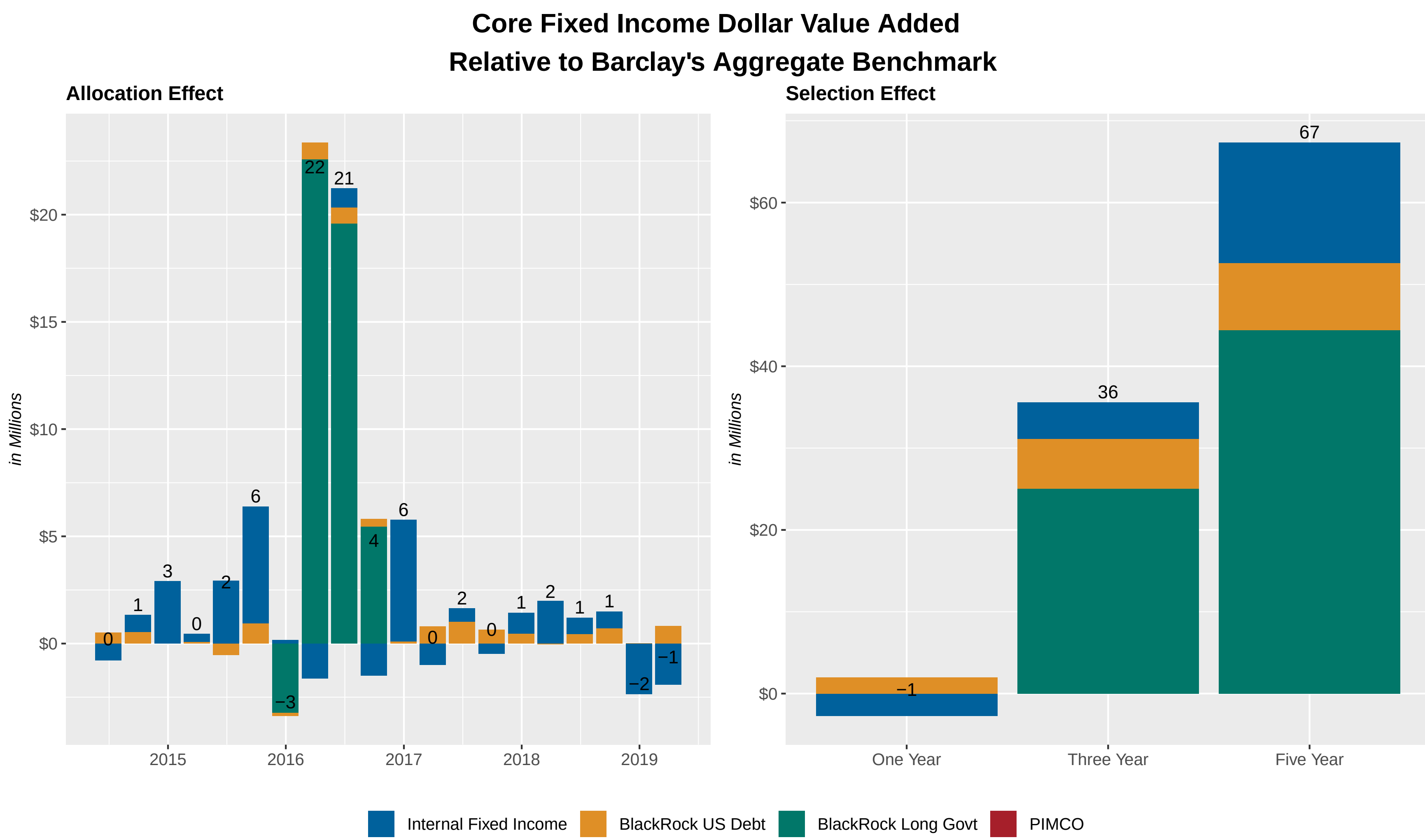
Annualized Returns

	FYTD	1 Year	3 Year	5 Year
Core Bond Composite	4.60	4.47	2.27	3.03
Barclay's Aggregate	4.65	4.48	2.03	2.74
Core Composite Excess	-0.05	-0.01	0.24	0.29
Internal Fixed Income	4.46	4.34	2.10	2.88
Barclay's Aggregate	4.65	4.48	2.03	2.74
Internal Fixed Income Excess	-0.18	-0.14	0.07	0.14
BlackRock US Debt Fund	4.73	4.58	2.12	
Barclay's Aggregate	4.65	4.48	2.03	
BlackRock Excess	0.08	0.10	0.10	





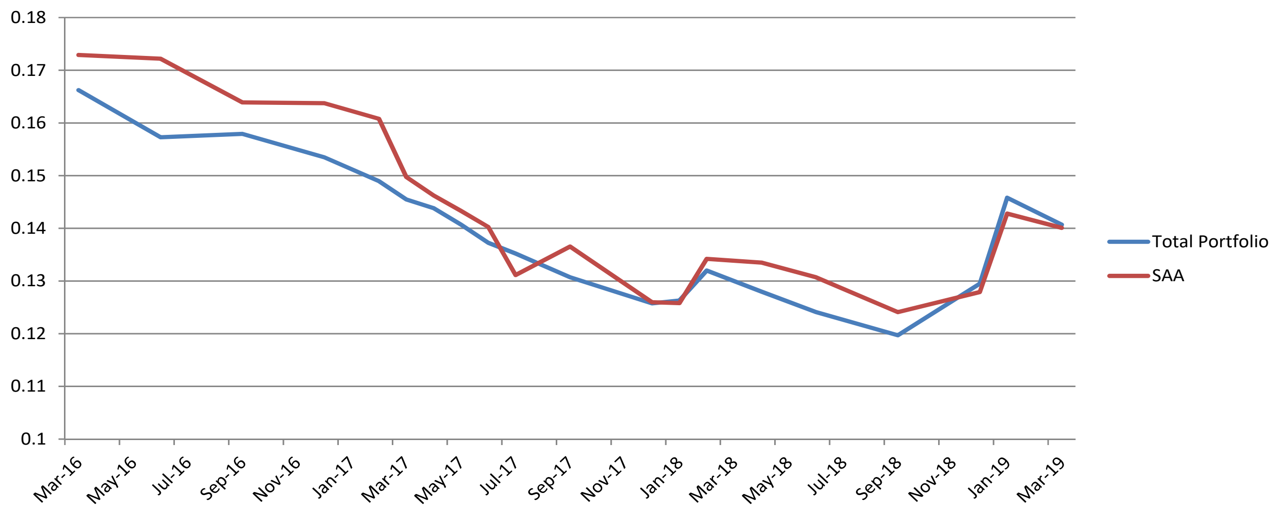
Core Fixed Income Dollar Value Added for the period ended 03/31/2019



Total Portfolio Value-At-Risk 3/31/2019

TOTAL PORTFOLIO VALUE-AT-RISK (VAR)

As of March 31st, 2019, total VaR for ASRS Portfolio was 14.73%, indicating that there is a 5% chance that portfolio could lose ~$5.6B in a given year. Note that a 5% event is expected to occur every 20 years



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