

Arizona State Retirement System

Independent ASRS Investment Program Oversight for the Period Ending March 31, 2016

June 20, 2016

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ASRS Investment Objectives/Performance

Note: All of the data shown on the following pages is as of March 31, 2016 and reflects the deduction of investment manager fees, unless otherwise noted.



Macro

- Objective #1: Achieve a twenty-year rolling annual total fund net rate of return equal to or greater than the actuarial assumed interest rate.
- Objective #2: Achieve one- and three-year rolling annual total fund net rates of return equal to or greater than the return of the ASRS Strategic Asset Allocation Policy (SAAP) Benchmark.
- Objective #3: Achieve one- and three-year rolling annual net rates of return for ASRS strategic asset classes that are equal to or greater than their respective strategic asset class benchmarks.
- Objective #4: Ensure sufficient monies are available to meet pension benefits, health insurance, member refunds, administrative payments, and other cash flow requirements.

Micro

Source: ASRS Strategic Plan, March 2013

- Objective #1: Achieve a twenty-year rolling annual total fund net rate of return equal to or greater than the actuarial assumed interest rate.

	<u>20 Year Annualized Return</u>
Total Fund	7.4%
Constant 8%	<u>8.0%</u>
Excess Return	(0.6)%

**Goal Met:
No**

- Objective #2: Achieve one- and three-year rolling annual total fund net rates of return equal to or greater than the return of the ASRS Strategic Asset Allocation Policy (SAAP) Benchmark.

	Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception (6/30/75)
Total Fund	1.4%	0.0%	6.7%	7.1%	5.7%	9.7%
Interim SAA Policy¹	1.4%	-1.4%	5.4%	6.2%	5.4%	9.4%
Excess Return	0.0%	1.4%	1.3%	0.9%	0.3%	0.3%

1 Year Goal Met: Yes
3 Year Goal Met: Yes

¹Composition of SAA Policy can be found in the appendix.

Arizona State Retirement System
Total Fund Attribution Analysis

Total Plan	1 Year	3 Years	5 Years
Allocation Effect ¹	0.03%	0.65%	0.38%
Manager Selection Effect ²	1.33%	0.63%	0.56%
Residual ³	0.03%	-0.02%	-0.05%
Excess Return	1.39%	1.26%	0.89%

The Brinson-Fachler Attribution model explains excess return by identifying the size of contributors or detractors from excess return based on the three effects defined below:

1. Allocation Effect: Measures the impact of the decision to over/under weight asset classes relative to Interim SAAP benchmark weights. (Return Asset Class Index – Total Interim Policy Index Return) × (Weight Asset Class Portfolio – Weight Asset Class Interim Policy Index)

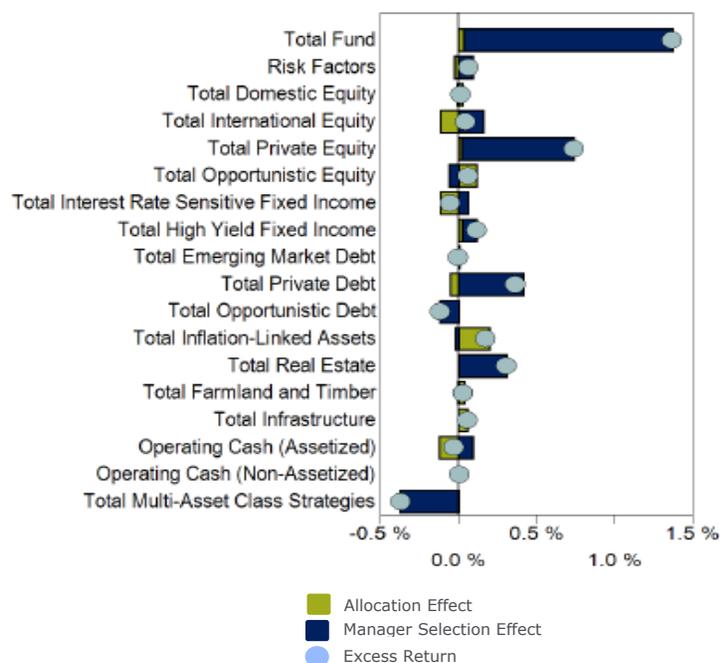
2. Manager Selection Effect: Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark. [Weight Asset Class Benchmark × (Return Portfolio Asset Class – Return Asset Class in Interim Policy Index)] + **Interaction Effect:** Measures the impact of over/under weighting decisions and over/under performance. (Return Asset Class Portfolio (Weight Asset Class Portfolio – Weight Asset Class Policy Index)) – (Return Asset Class Index (Weight Asset Class Portfolio – Weight Asset Class Index))

3. Residual: Contribution to excess return not captured in Allocation Effect and Manager Selection Effect.

Arizona State Retirement System

Total Fund Attribution Detail

Attribution Effects
1 Year Ending March 31, 2016



1 Year Excess Return: +1.39%

- Allocation Effect: +0.03%
 - Commodities tactical underweight (+0.19%)
 - Opportunistic Equity tactical allocation (+0.12%)
 - Infrastructure overweight (+0.06%)
- Manager Selection Effect: +1.33%
 - Private Equity outperformed due to various managers (+0.72%)
 - Private Debt outperformed due to various managers (+0.41%)
 - Real Estate outperformed due to various managers (+0.30%)
 - Risk Factors outperformed (+0.09%)
 - Opportunistic Debt underperformed (-0.12%)
 - Opportunistic Equity Underperformed (-0.06%)
- Residual: +0.03%

The Brinson-Fachler Attribution model explains excess return by identifying the size of contributors or detractors from excess return based on the three effects defined below:

Allocation Effect: Measures the impact of the decision to over/under weight asset classes relative to Interim SAAP benchmark weights. $(\text{Return Asset Class Index} - \text{Total Interim Policy Index Return}) \times (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Interim Policy Index})$

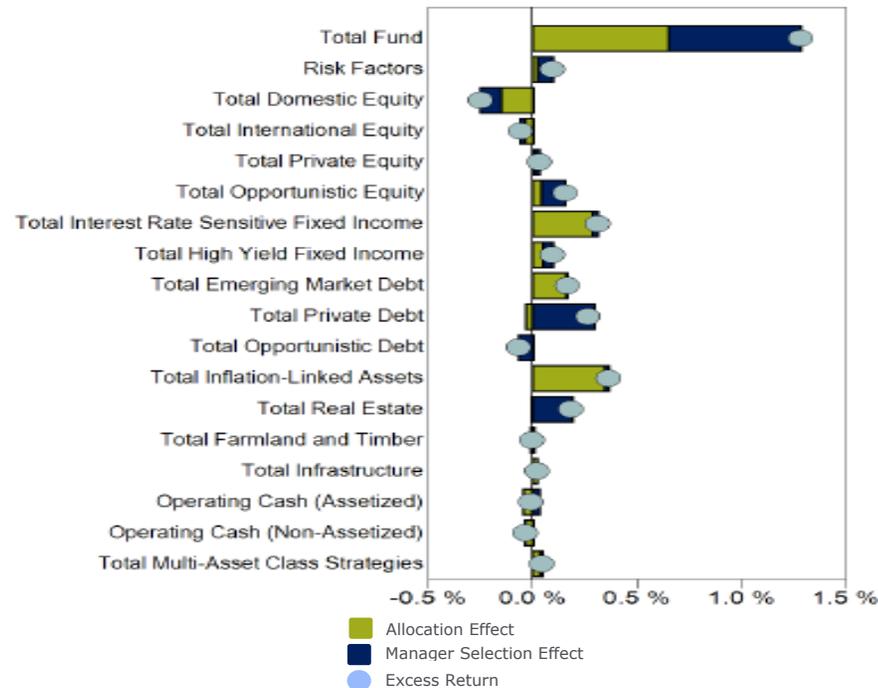
Manager Selection Effect: Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark. $[\text{Weight Asset Class Benchmark} \times (\text{Return Portfolio Asset Class} - \text{Return Asset Class in Interim Policy Index})]$ + **Interaction Effect:** Measures the impact of over/under weighting decisions and over/under performance. $(\text{Return Asset Class Portfolio} (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Policy Index})) - (\text{Return Asset Class Index} (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Index}))$

Residual: Contribution to excess return not captured in Allocation Effect and Manager Selection Effect.

Arizona State Retirement System

Total Fund Attribution Detail

Attribution Effects 3 Years Ending March 31, 2016



3 Year Excess Return: +1.26%

- Allocation Effect: +0.65%
 - Commodities tactical underweight (+0.34%)
 - Public Markets Fixed Income tactical underweight (+0.33%)
 - Emerging Market Debt tactical underweight (+0.16%)
 - Domestic Equity tactical underweight (-0.16%)
 - Private Debt underweight (-0.03%)
- Manager Selection Effect: +0.63%
 - Private Debt outperformed due to various managers (+0.29%)
 - Real Estate outperformed due to various managers (+0.19%)
 - Opportunistic Equity outperformed due to various managers (+0.11%)
 - Risk Factors outperformed (+0.07%)
 - Public Markets Fixed Income outperformed (+0.07%)
 - Domestic Equity underperformed (-0.10%)
- Residual: -0.02%

The Brinson-Fachler Attribution model explains excess return by identifying the size of contributors or detractors from excess return based on the three effects defined below:

Allocation Effect: Measures the impact of the decision to over/under weight asset classes relative to Interim SAAP benchmark weights. $(\text{Return Asset Class Index} - \text{Total Interim Policy Index Return}) \times (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Interim Policy Index})$

Manager Selection Effect: Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark. $[\text{Weight Asset Class Benchmark} \times (\text{Return Portfolio Asset Class} - \text{Return Asset Class in Interim Policy Index})]$ + **Interaction Effect:** Measures the impact of over/under weighting decisions and over/under performance. $(\text{Return Asset Class Portfolio} (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Policy Index})) - (\text{Return Asset Class Index} (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Index}))$

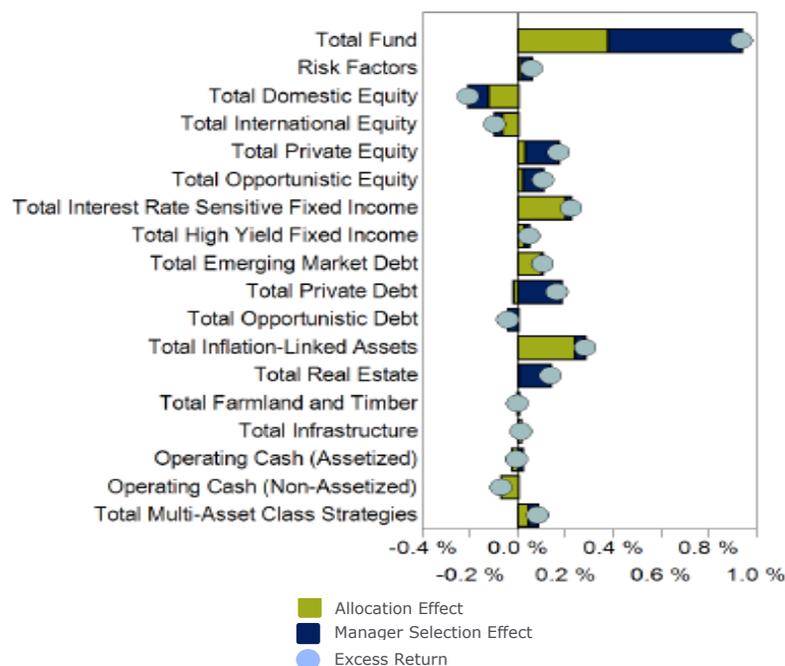
Residual: Contribution to excess return not captured in Allocation Effect and Manager Selection Effect.



Arizona State Retirement System

Total Fund Attribution Detail

Attribution Effects 5 Years Ending March 31, 2016



5 Year Excess Return: +0.89%

- Allocation Effect: +0.38%
 - Public Markets Fixed Income tactical underweight (+0.33%)
 - Commodities tactical underweight (+0.24%)
 - Domestic Equity tactical underweight (-0.13%)
 - International Equity tactical overweight (-0.07%)
- Manager Selection Effect: +0.56%
 - Private Debt outperformed due to various managers (+0.18%)
 - Private Equity outperformed due to various managers (+0.14%)
 - Real Estate outperformed due to various managers (+0.13%)
 - Opportunistic Equity outperformed due to various managers (+0.08%)
 - Commodities outperformed (+0.04%)
 - Risk Factor outperformed (+0.04%)
 - Domestic Equity underperformed due to various managers (-0.08%)
- Residual: -0.05%

The Brinson-Fachler Attribution model explains excess return by identifying the size of contributors or detractors from excess return based on the three effects defined below:

Allocation Effect: Measures the impact of the decision to over/under weight asset classes relative to Interim SAAP benchmark weights. $(\text{Return Asset Class Index} - \text{Total Interim Policy Index Return}) \times (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Interim Policy Index})$

Manager Selection Effect: Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark. $[\text{Weight Asset Class Benchmark} \times (\text{Return Portfolio Asset Class} - \text{Return Asset Class in Interim Policy Index})]$ + **Interaction Effect:** Measures the impact of over/under weighting decisions and over/under performance. $(\text{Return Asset Class Portfolio} (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Policy Index})) - (\text{Return Asset Class Index} (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Index}))$

Residual: Contribution to excess return not captured in Allocation Effect and Manager Selection Effect.



Asset Class Performance vs. Benchmark – Public Markets

- Objective #3: Achieve one- and three-year rolling annual net rates of return for ASRS strategic asset classes that are equal to or greater than their respective strategic asset class benchmarks.

	1 Year Return	3 Year Return
ASRS Total Domestic and Int'l Equity ¹	-3.2%	6.9%
ASRS Custom Total Equity Benchmark	-3.6%	6.9%
Excess Return	0.4%	0.0%
ASRS Domestic Equity	0.7%	11.2%
ASRS Custom Domestic Equity Benchmark	0.6%	11.4%
Excess Return	0.1%	-0.2%
ASRS International Equity	-7.4%	1.0%
ASRS Custom Int'l Equity Benchmark	-8.1%	1.1%
Excess Return	0.7%	-0.1%
ASRS Public Markets Fixed Income	1.8%	1.6%
ASRS Custom Fixed Income Benchmark	0.5%	0.8%
Excess Return	1.3%	0.8%
ASRS Inflation-Linked	-21.6%	-16.8%
ASRS Custom Inflation-Linked Benchmark	-19.6%	-16.9%
Excess Return	-2.0%	0.1%
ASRS Multi-Asset Class Strategies	-10.4%	3.7%
ASRS Multi-Asset Class Strategies Benchmark	-1.5%	5.7%
Excess Return	-8.9%	-2.0%

¹Performance of ASRS Total Domestic and Int'l Equity includes the performance of the ASRS Domestic Equity and ASRS International Equity asset classes and the Equity Risk Factor Portfolio with an inception date of 6/1/2013.

Note: Composition of ASRS Custom Asset Class Benchmarks can be found in the appendix.

**Goal Met:
Partially**

Asset Class Performance vs. Benchmark – Private Markets¹

- Objective #3: Achieve one- and three-year rolling annual net rates of return for ASRS strategic asset classes that are equal to or greater than their respective strategic asset class benchmarks.

	1 Year Return	3 Year Return	IRR Since Inception	Inception Date
ASRS Private Equity	5.5%	11.0%	11.0%	Oct-07
Russell 2000	-5.9%	9.3%	9.7%	
Excess Return	11.4%	1.7%	1.3%	
ASRS Opportunistic Equity ²	3.8%	22.2%	23.1%	Apr-11
ASRS Private Debt	8.5%	10.7%	10.9%	Jul-12
S&P/LSTA Leveraged Loan Index + 250 bps	1.1%	3.1%	3.3%	
Excess Return	7.4%	7.6%	7.6%	
ASRS Opportunistic Debt ²	-3.1%	4.2%	9.3%	Jan-08
ASRS Real Estate	14.9%	14.5%	8.1%	Oct-05
NFI - ODCE Index	14.3%	12.9%	7.0%	
Excess Return	0.6%	1.6%	1.1%	
ASRS Farmland and Timber	4.5%	--	4.3%	Jul-13
CPI ex-Food and Energy + 350 bps	5.7%	--	5.5%	
Excess Return	-1.2%		-1.2%	
ASRS Total Infrastructure	5.3%	--	5.1%	Dec-14
CPI ex-Food and Energy + 350 bps	5.7%	--	5.5%	
Excess Return	-0.4%		-0.4%	

1- Performance of private markets portfolios and corresponding benchmarks is reported on a one quarter lag. Performance shown as of December 31, 2015.

2- Net absolute rate of return expectations range from 10-14% per annum.

Note: Due to the drawdown nature of private markets portfolios in which the investment managers call capital over time, dollar-weighted performance, or internal rate of return (IRR) is a more appropriate measure of the performance of ASRS private markets portfolios.

**Goal Met:
Partially**



Cash Management

- Objective #4: Ensure sufficient monies are available to meet pension benefits, health insurance, member refunds, administrative payments, and other cash flow requirements.

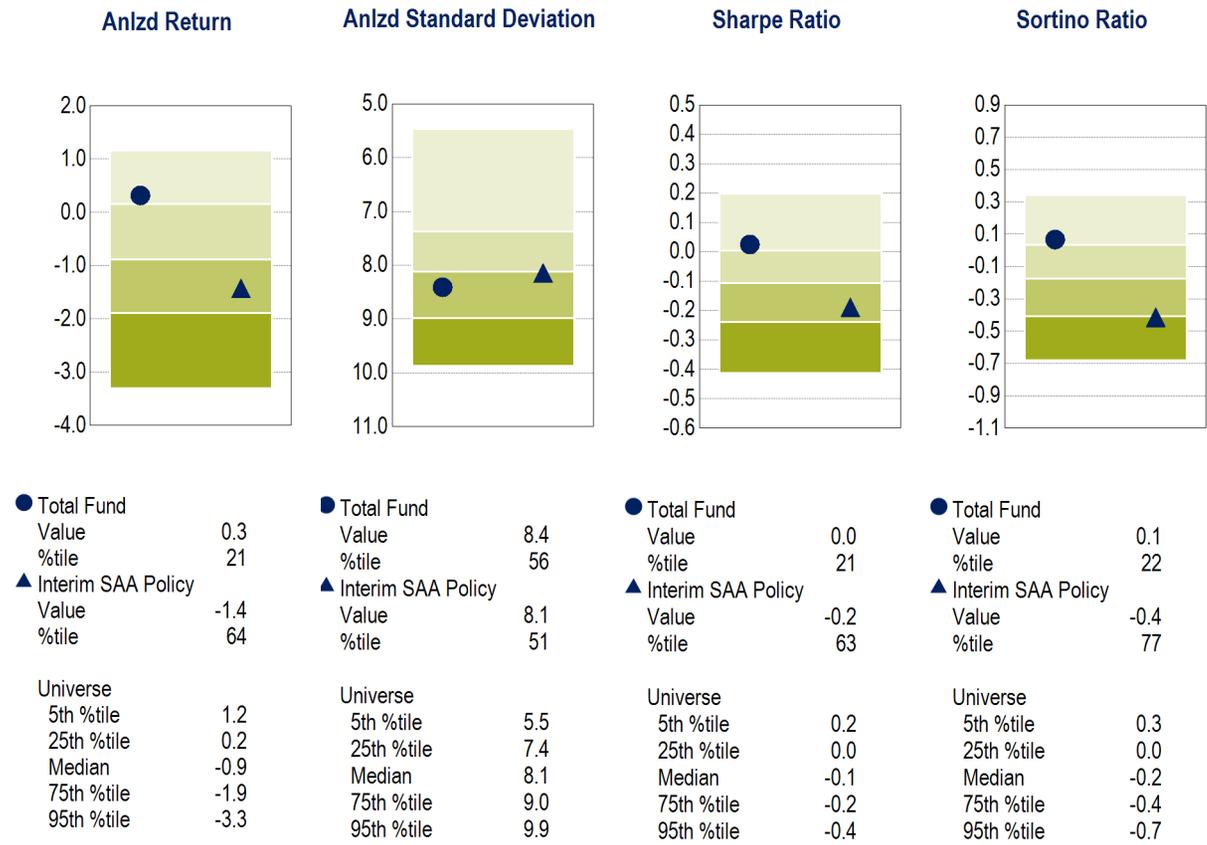
Month	External CFs	Last day of the Month Ending Balance*
Feb – 15	(\$123.2)	\$80.4
Mar – 15	(\$64.8)	\$418.0
Apr – 15	(\$90.9)	\$550.1
May – 15	(\$47.8)	\$479.0
Jun – 15	(\$74.4)	\$318.3
Jul – 15	(\$150.0)	\$405.5
Aug – 15	(\$136.3)	\$351.7
Sep – 15	(\$103.3)	\$392.0
Oct – 15	(\$73.0)	\$394.5
Nov – 15	(\$107.8)	\$705.5
Dec – 15	(\$65.4)	\$966.1
Jan – 16	(\$108.6)	\$788.9
Feb – 16	(\$109.2)	\$545.2
Mar - 16	(\$94.4)	\$517.3

***Includes assetized & unassetized cash balances (Inception of 1/26/15); represents monies to be used for funding needs that occur in subsequent month(s). Generally, monthly pension payments occur on the first day of month.**

**Goal Met:
Yes**

Total Fund Risk Statistics vs. Peer Universe

Total Fund vs. IFx Public DB > \$1B Gross(USD)(peer)
1 Year



Note: The information contained herein is for comparison purposes only and is not a Total Fund benchmark. Peer universe comparisons are subject to several limitations, including: peer groups are not comprehensive; several funds are included in multiple peer groups; peer groups are constructed using gross of fee returns; and survivorship bias in that poorly performing funds may no longer report results.

Universes are constructed using gross of fee returns; therefore, ASRS rank is based on gross of fee returns.

Rankings are from highest (1) to lowest (100) in the InvestorForce Public Funds > \$1 Billion Universe.

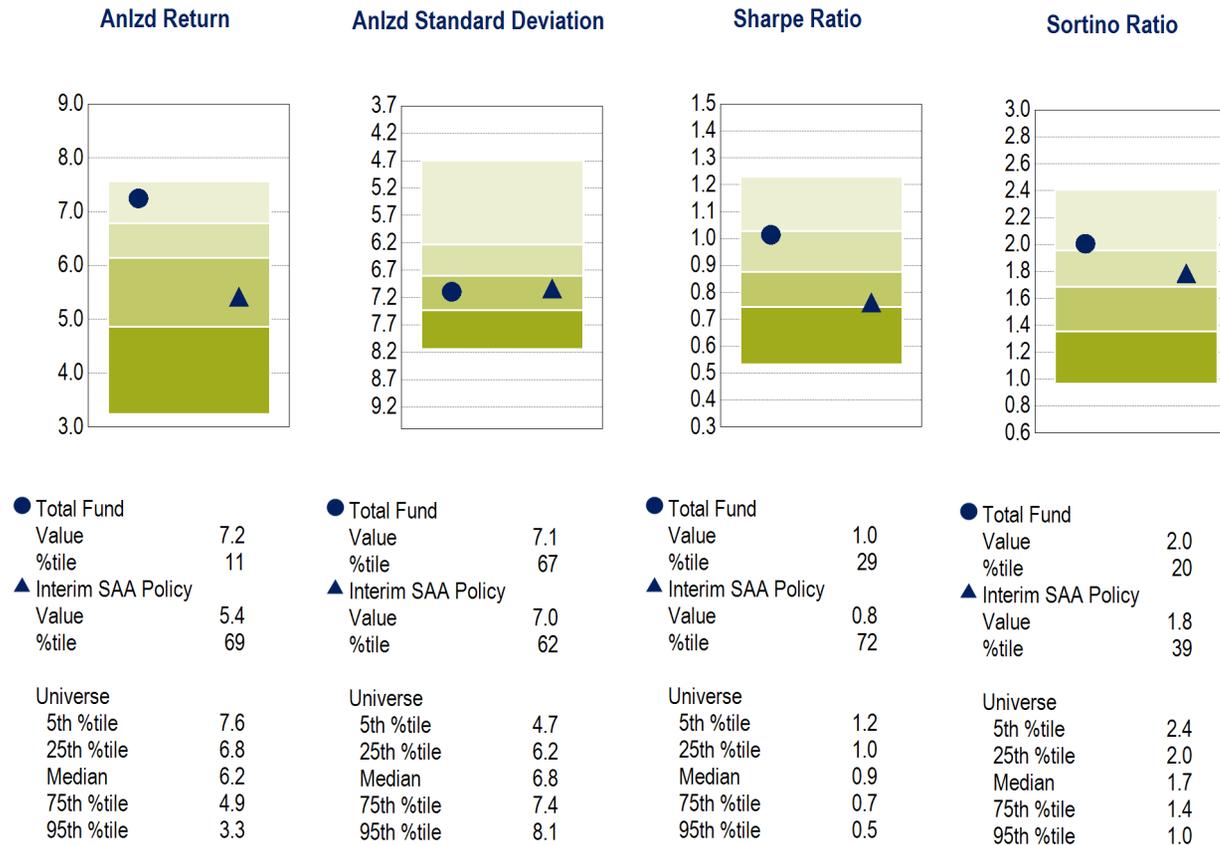
The InvestorForce Public Funds > \$1 Billion Universe contains 106 observations for the period ending March 31, 2016, with total assets of \$1.9 trillion.

Composition of Interim SAA Policy can be found in the appendix.

Total Fund Risk Statistics vs. Peer Universe

Total Fund vs. IFx Public DB > \$1B Gross(USD)(peer)

3 Year



Note: The information contained herein is for comparison purposes only and is not a Total Fund benchmark. Peer universe comparisons are subject to several limitations, including: peer groups are not comprehensive; several funds are included in multiple peer groups; peer groups are constructed using gross of fee returns; and survivorship bias in that poorly performing funds may no longer report results.

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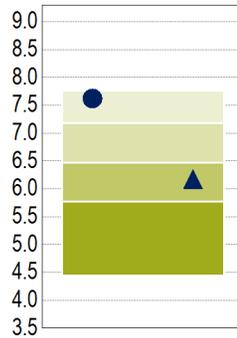
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Total Fund Risk Statistics vs. Peer Universe

Total Fund vs. IFx Public DB > \$1B Gross(USD)(peer)

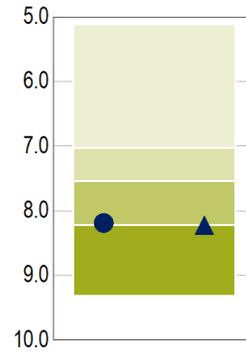
5 Year

Anlzd Return



● Total Fund	
Value	7.6
%tile	9
▲ Interim SAA Policy	
Value	6.2
%tile	67
Universe	
5th %tile	7.8
25th %tile	7.2
Median	6.5
75th %tile	5.8
95th %tile	4.5

Anlzd Standard Deviation



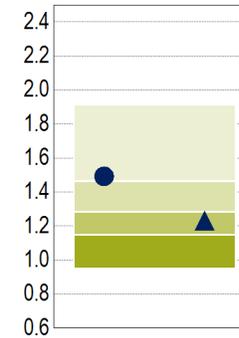
● Total Fund	
Value	8.2
%tile	75
▲ Interim SAA Policy	
Value	8.2
%tile	76
Universe	
5th %tile	5.1
25th %tile	7.0
Median	7.5
75th %tile	8.2
95th %tile	9.3

Sharpe Ratio



● Total Fund	
Value	0.9
%tile	29
▲ Interim SAA Policy	
Value	0.7
%tile	75
Universe	
5th %tile	1.2
25th %tile	1.0
Median	0.8
75th %tile	0.7
95th %tile	0.6

Sortino Ratio



● Total Fund	
Value	1.5
%tile	23
▲ Interim SAA Policy	
Value	1.2
%tile	60
Universe	
5th %tile	1.9
25th %tile	1.5
Median	1.3
75th %tile	1.2
95th %tile	1.0

Note: The information contained herein is for comparison purposes only and is not a Total Fund benchmark. Peer universe comparisons are subject to several limitations, including: peer groups are not comprehensive; several funds are included in multiple peer groups; peer groups are constructed using gross of fee returns; and survivorship bias in that poorly performing funds may no longer report results.

Universes are constructed using gross of fee returns; therefore, ASRS rank is based on gross of fee returns.

Rankings are from highest (1) to lowest (100) in the InvestorForce Public Funds > \$1 Billion Universe.

The InvestorForce Public Funds > \$1 Billion Universe contains 106 observations for the period ending March 31, 2016, with total assets of \$1.9 trillion.

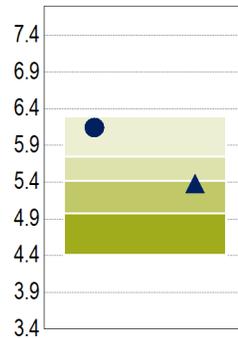
Composition of Interim SAA Policy can be found in the appendix.

Total Fund Risk Statistics vs. Peer Universe

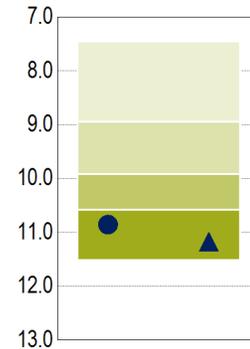
Total Fund vs. IFx Public DB > \$1B Gross(USD)(peer)

10 Year

Anlzd Return



Anlzd Standard Deviation



Sharpe Ratio



Sortino Ratio



● Total Fund

Value 6.1
%tile 7

▲ Interim SAA Policy

Value 5.4
%tile 52

Universe

5th %tile 6.3
25th %tile 5.8
Median 5.4
75th %tile 5.0
95th %tile 4.4

● Total Fund

Value 10.9
%tile 86

▲ Interim SAA Policy

Value 11.2
%tile 90

Universe

5th %tile 7.5
25th %tile 8.9
Median 9.9
75th %tile 10.6
95th %tile 11.5

● Total Fund

Value 0.5
%tile 33

▲ Interim SAA Policy

Value 0.4
%tile 83

Universe

5th %tile 0.6
25th %tile 0.5
Median 0.5
75th %tile 0.4
95th %tile 0.3

● Total Fund

Value 0.7
%tile 33

▲ Interim SAA Policy

Value 0.6
%tile 77

Universe

5th %tile 0.9
25th %tile 0.7
Median 0.6
75th %tile 0.6
95th %tile 0.5

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Rankings are from highest (1) to lowest (100) in the InvestorForce Public Funds > \$1 Billion Universe.

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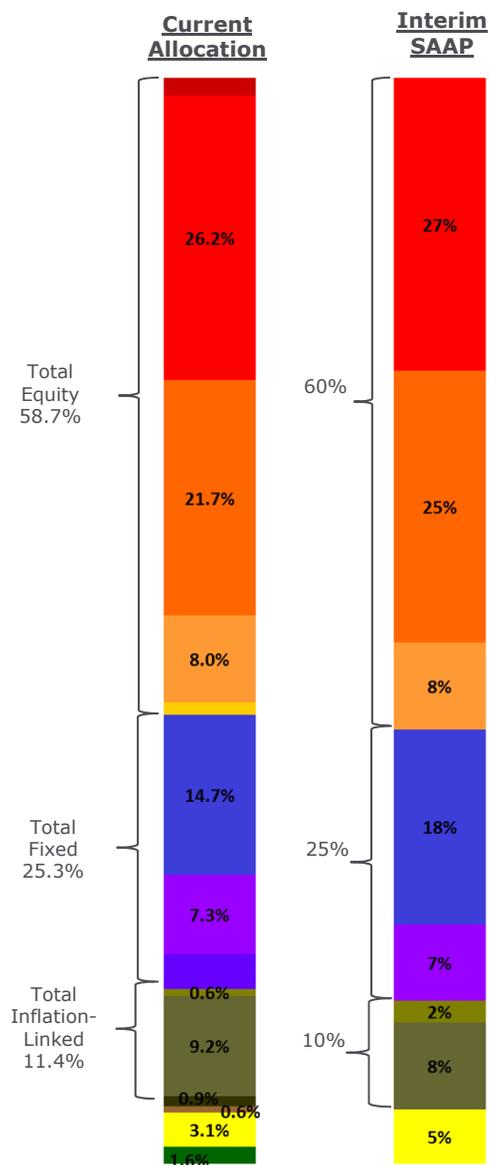
Composition of Interim SAA Policy can be found in the appendix.

Independent Oversight/Compliance

Note: All of the data shown on the following pages is as of March 31, 2016 and reflects the deduction of investment manager fees, unless otherwise noted.



SAA Policy Compliance



	Current Mkt Value	Current Allocation	Interim SAAP	Interim SAAP Difference	Policy Range	Within Range	SAAP
Total Domestic and International Equity	\$16,705,833,499	49.5%	52%	-2.5%			50%
Equity Risk Factor Portfolio	\$567,997,998	1.7%	0%	1.7%			0%
Domestic Equity¹	\$8,824,255,565	26.2%	27%	-0.8%	16% - 36%	Yes	26%
U.S. Large Cap	\$6,845,947,067	20.3%	21%	-0.7%			20%
U.S. Mid Cap	\$1,039,309,790	3.1%	3%	0.1%			3%
U.S. Small Cap	\$938,998,277	2.8%	3%	-0.2%			3%
International Equity¹	\$7,313,579,937	21.7%	25%	-3.3%	14% - 34%	Yes	24%
Developed Large Cap	\$5,588,709,335	16.6%	18%	-1.4%			17%
Developed Small Cap	\$669,097,034	2.0%	2%	0.0%			2%
Emerging Markets	\$1,055,311,717	3.1%	5%	-1.9%			5%
Private Equity²	\$2,687,844,373	8.0%	8%	0.0%	6% - 10%	Yes	8%
Opportunistic Equity^{2,4}	\$396,147,125	1.2%	0%	1.2%			0%
Total Equity	\$19,789,824,996	58.7%	60%	-1.3%	48% - 65%	Yes	58%
Public Markets Fixed Income¹	\$4,965,178,558	14.7%	18%	-3.3%			15%
Treasuries Long Duration	\$382,039,530	1.1%	0%	1.1%	0% - 10%	Yes	0%
Interest Rate Sensitive	\$3,544,981,075	10.5%	14%	-3.5%			11%
High Yield	\$1,038,157,952	3.1%	4%	-0.9%			4%
Private Debt²	\$2,464,453,293	7.3%	7%	0.3%	8% - 12%	No	10%
Opportunistic Debt^{2,4}	\$1,095,566,540	3.2%	0%	3.2%			0%
Total Fixed Income	\$8,525,198,391	25.3%	25%	0.3%	18% - 35%	Yes	25%
Commodities	\$207,002,874	0.6%	2%	-1.4%	0% - 4%	Yes	2%
Real Estate²	\$3,119,892,653	9.2%	8%	1.2%	8% - 12%	Yes	10%
Infrastructure²	\$316,552,244	0.9%	0%	0.9%	0% - 3%	Yes	0%
Farmland and Timber²	\$188,451,439	0.6%	0%	0.6%	0% - 3%	Yes	0%
Opportunistic Inflation-Linked⁴	\$0	0.0%	0%	0.0%			0%
Total Inflation-Linked	\$3,831,899,209	11.4%	10%	1.4%	10% - 16%	Yes	12%
Multi-Asset Class Strategies	\$1,053,935,722	3.1%	5%	-1.9%	0% - 12%	Yes	5%
Cash³	\$529,104,951	1.6%	0%	1.6%			0%
Operating Cash (Non-Assetized)	\$70,663,468	0.2%	0%	0.2%			0%
Operating Cash (Assetized)	\$458,441,483	1.4%	0%	1.4%			0%
Total	\$33,729,963,270	100%	100%	0%			100%

¹Domestic Equity, International Equity and Public Markets Fixed Income market values include residual values remaining in terminated manager accounts.

²Values shown for private markets portfolios include cash flows that occurred during 1Q 2016.

³Cash includes money for the upcoming monthly pension distribution.

⁴Aggregate Opportunistic asset classes not to exceed 10%.

Note: Interim SAA Policy includes proration of 3% Private Debt and 2% Real Estate, which are unfunded.

Policy Ranges shown are relative to the long-term SAAP, causing some asset classes to be out of range while implementation of the long-term SAAP is in process.

Market values include manager held cash.

Arizona State Retirement System

Asset Class Performance Summary - Public Markets

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	FYTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Since
Total Fund	33,729,963,270	100.0	1.4	--	-0.7	--	0.0	--	6.7	--	7.1	--	5.7	--	9.7	Jul-75
<i>Interim SAA Policy</i>			<u>1.4</u>	--	<u>-2.1</u>	--	<u>-1.4</u>	--	<u>5.4</u>	--	<u>6.2</u>	--	<u>5.4</u>	--	<u>9.4</u>	<i>Jul-75</i>
Over/Under			0.0		1.4		1.4		1.3		0.9		0.3		0.3	
<i>Actual Benchmark</i>			<u>1.4</u>	--	<u>-2.0</u>	--	<u>-1.3</u>	--	<u>6.0</u>	--	<u>6.5</u>	--	<u>5.3</u>	--	--	<i>Jul-75</i>
Total Domestic and International Equity¹	16,705,833,499	49.5	0.4	--	-3.7	--	-3.2	--	6.9	--	7.2	--	5.3	--	6.3	Jan-98
<i>ASRS Custom Total Equity Benchmark</i>			<u>0.4</u>	--	<u>-4.1</u>	--	<u>-3.6</u>	--	<u>6.9</u>	--	<u>7.3</u>	--	<u>5.6</u>	--	<u>5.7</u>	<i>Jan-98</i>
Over/Under			0.0		0.4		0.4		0.0		-0.1		-0.3		0.6	
Total Domestic Equity	8,824,255,565	26.2	1.9	1	0.7	8	0.7	8	11.2	8	10.9	16	7.4	6	11.1	Jul-75
<i>ASRS Custom Domestic Equity Benchmark</i>			<u>1.8</u>	4	<u>0.5</u>	8	<u>0.6</u>	8	<u>11.4</u>	4	<u>11.2</u>	3	<u>7.4</u>	6	<u>11.2</u>	<i>Jul-75</i>
Over/Under			0.1		0.2		0.1		-0.2		-0.3		0.0		-0.1	
<i>InvestorForce Public DB > \$1 Billion US Equity Net Median</i>			<u>0.6</u>		<u>-2.2</u>		<u>-2.1</u>		<u>10.3</u>		<u>10.0</u>		<u>6.5</u>		<u>11.1</u>	<i>Jul-75</i>
Total International Equity	7,313,579,937	21.7	-1.5	81	-8.9	78	-7.4	65	1.0	75	1.2	70	1.9	76	5.7	Apr-87
<i>ASRS Custom Int'l Equity Benchmark</i>			<u>-1.0</u>	68	<u>-8.9</u>	78	<u>-8.1</u>	77	<u>1.1</u>	72	<u>1.4</u>	65	<u>2.7</u>	20	<u>5.4</u>	<i>Apr-87</i>
Over/Under			-0.5		0.0		0.7		-0.1		-0.2		-0.8		0.3	
<i>InvestorForce Public DB > \$1 Billion Global ex-US Equity Net Median</i>			<u>-0.1</u>		<u>-8.1</u>		<u>-7.1</u>		<u>1.6</u>		<u>1.6</u>		<u>2.1</u>		<u>5.7</u>	<i>Apr-87</i>
Total Public Markets Fixed Income	4,965,178,558	14.7	3.4	28	3.0	24	1.8	26	1.6	57	3.6	71	5.0	62	8.2	Jan-00
<i>ASRS Custom Public Markets Fixed Income Benchmark</i>			<u>3.1</u>	36	<u>1.7</u>	38	<u>0.5</u>	53	<u>0.8</u>	74	<u>3.0</u>	90	<u>4.5</u>	85	--	<i>Jul-75</i>
Over/Under			0.3		1.3		1.3		0.8		0.6		0.5		--	
<i>InvestorForce Public DB > \$1 Billion Fixed Income Net Median</i>			<u>2.9</u>		<u>1.0</u>		<u>0.5</u>		<u>1.6</u>		<u>3.9</u>		<u>5.3</u>		<u>8.2</u>	<i>Jul-75</i>
Total Inflation-Linked Assets	207,002,874	0.6	-0.2	80	-24.7	99	-21.6	94	-16.8	99	-13.1	99	--	--	-7.4	Feb-10
<i>ASRS Custom Inflation-Linked Benchmark</i>			<u>0.4</u>	65	<u>-23.1</u>	93	<u>-19.6</u>	91	<u>-16.9</u>	99	<u>-13.9</u>	99	--	--	<u>-8.3</u>	<i>Feb-10</i>
Over/Under			-0.6		-1.6		-2.0		0.1		0.8		--		0.9	
<i>InvestorForce Public DB > \$1 Billion Real Assets/Commodities Net Median</i>			<u>1.3</u>		<u>-6.8</u>		<u>-7.3</u>		<u>-2.6</u>		<u>2.5</u>		<u>5.1</u>		<u>4.2</u>	<i>Feb-10</i>
Total Multi-Asset Class Strategies	1,053,935,722	3.1	-4.4	99	-9.1	99	-10.4	99	3.7	1	5.7	12	6.0	1	6.6	Jan-04
<i>Multi-Asset Class Strategies Custom Benchmark</i>			<u>0.1</u>	84	<u>-1.0</u>	1	<u>-1.5</u>	1	<u>5.7</u>	1	<u>6.5</u>	1	<u>5.2</u>	36	<u>5.9</u>	<i>Jan-04</i>
Over/Under			-4.5		-8.1		-8.9		-2.0		-0.8		0.8		0.7	
<i>InvestorForce Public DB > \$1 Billion Global Tactical Net Median</i>			<u>1.2</u>		<u>-4.8</u>		<u>-6.1</u>		<u>0.5</u>		<u>4.4</u>		<u>5.0</u>		<u>5.8</u>	<i>Jan-04</i>
Operating Cash (Assetized)	458,441,483	1.4	1.7	--	-4.4	--	-3.4	--	--	--	--	--	--	--	0.4	Feb-15
<i>ASRS Cash Assetization Custom Benchmark</i>			<u>1.5</u>	--	<u>-9.8</u>	--	<u>-9.9</u>	--	--	--	--	--	--	--	<u>-6.0</u>	<i>Feb-15</i>
Over/Under			0.2		5.4		6.5		--		--		--		6.4	

¹Performance of ASRS Total Domestic and International Equity includes the performance of the ASRS Domestic and International Equity asset classes and the Equity Risk Factor Portfolio with an inception date of 6/1/2013. NEPC began calculating Total Domestic and International Equity performance in January 2009. Monthly performance data from January 1998 - December 2008 was provided by State Street.

Note: Performance, ranks and medians are based on net of fee performance data. Rankings are from highest (1) to lowest (100) in the eVestment Universe.

Universe shown for Total Public Markets Fixed Income includes all U.S. fixed income strategies and does not accurately represent the exposures of the ASRS Public Markets Fixed Income allocation, which has included allocations ranging from 10% - 25% to emerging markets debt historically.

Composition of Interim SAA Policy and ASRS Custom Asset Class Benchmarks can be found in the appendix.

Arizona State Retirement System

Asset Class Performance Summary - Private Markets

	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Inception (%)	Since		
Total Fund	33,729,963,270	100.0	1.4	--	0.0	--	6.7	7.1	9.7	Jul-75
<i>Interim SAA Policy</i>			<u>1.4</u>	--	<u>-1.4</u>	--	<u>5.4</u>	--	<u>6.2</u>	<i>Jul-75</i>
Over/Under			0.0	1.4	1.3	0.9	0.3			
<i>Actual Benchmark</i>			1.4	--	<u>-1.3</u>	--	<u>6.0</u>	--	--	<i>Jul-75</i>
Total Private Equity	2,622,714,403	7.8	1.0	5.5	11.0	12.5	11.0	11.0	11.0	Oct-07
<i>Russell 2000 1 QTR Lagged</i>			<u>3.2</u>	<u>-5.9</u>	<u>9.3</u>	<u>8.1</u>	<u>9.7</u>	<u>9.7</u>	<u>9.7</u>	<i>Oct-07</i>
Over/Under			-2.2	11.4	1.7	4.4	1.3			
Total Opportunistic Equity¹	509,891,102	1.5	3.7	3.8	22.2		23.1			Apr-11
Total Private Debt	2,381,652,235	7.1	1.9	8.5	10.7		10.9			Jul-12
<i>S&P/LSTA Leveraged Loan Index + 250 bps 1 QTR Lagged</i>			<u>-1.5</u>	<u>1.1</u>	<u>3.1</u>	--	<u>3.3</u>			<i>Jul-12</i>
Over/Under			3.4	7.4	7.6	--	7.6			
Total Opportunistic Debt¹	1,117,282,802	3.3	-3.7	-3.1	4.2	5.5	9.3			Jan-08
Total Real Estate	2,961,890,110	8.8	8.2	14.9	14.5	14.0	8.1			Oct-05
<i>NCREIF ODCE 1 QTR Lagged (net)</i>			<u>3.4</u>	<u>14.3</u>	<u>12.9</u>	<u>12.7</u>	<u>7.0</u>			<i>Oct-05</i>
Over/Under			4.8	0.6	1.6	1.3	1.1			
Total Farmland and Timber	188,451,439	0.6	3.1	4.5			4.3			Jul-13
<i>CPI ex-Food and Energy + 350 bps 1 QTR Lagged</i>			<u>1.4</u>	<u>5.7</u>	--	--	<u>5.5</u>			<i>Jul-13</i>
Over/Under			1.7	-1.2	--	--	-1.2			
Total Infrastructure	316,552,244	0.9	0.6	5.3			5.1			Dec-14
<i>CPI ex-Food and Energy + 350 bps 1 QTR Lagged</i>			<u>1.4</u>	<u>5.7</u>	--	--	<u>5.5</u>			<i>Dec-14</i>
Over/Under			-0.8	-0.4	--	--	-0.4			

¹Net absolute rate of return expectations range from 10-14% per annum.

Note: Performance in private markets asset classes is based on net of fee dollar-weighted (IRR) performance data.

Due to the drawdown nature of private markets portfolios in which the investment managers call capital over time, dollar-weighted performance, or internal rate of return, is a more appropriate measure of ASRS private markets portfolios.

Performance data for Total Private Equity, Total Opportunistic Equity, Total Private Debt, Total Opportunistic Debt, Total Real Estate, Total Farmland and Timber, and Total Infrastructure and corresponding benchmarks is lagged by one quarter. Performance data and market values provided by State Street.

Prior to 3Q 2012, the performance of the Total Private Debt and Total Opportunistic Debt asset classes was reported in aggregate. Effective 6/30/2012, the Fund's allocations to Private Debt and Opportunistic Debt were separated and will be reported separately going forward.

Composition of Interim SAA Policy can be found in the appendix.

Arizona State Retirement System

Public Market Asset Class Analysis

3 Years Ending March 31, 2016

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Rank	Info Ratio	Rank	Anlzd AJ	Rank	Beta	Sharpe Ratio
Total Fund	100.0%	6.7%	--	7.1%	--	1.2%	--	1.0	--	1.3%	--	1.0	0.9
Interim SAA Policy	--	5.4%	--	7.0%	--	--	--	--	--	--	--	--	0.8
Total Domestic and International Equity	49.5%	6.9%	--	11.6%	--	0.6%	--	0.0	--	0.2%	--	1.0	0.6
ASRS Custom Total Equity Benchmark	--	6.9%	--	11.9%	--	--	--	--	--	--	--	--	0.6
Total Domestic Equity	26.2%	11.2%	8	11.4%	20	0.4%	3	-0.6	61	-0.1%	14	1.0	1.0
ASRS Custom Domestic Equity Benchmark	--	11.4%	4	11.5%	32	--	--	--	--	--	12	--	1.0
Total International Equity	21.7%	1.0%	75	13.2%	82	0.8%	1	-0.1	90	-0.1%	90	1.0	0.1
ASRS Custom Int'l Equity Benchmark	--	1.1%	72	13.5%	95	--	--	--	--	--	86	--	0.1
Total Public Markets Fixed Income	14.7%	1.6%	57	4.0%	69	0.8%	23	0.9	6	0.7%	23	1.0	0.4
ASRS Custom Public Markets Fixed Income Benchmark	--	0.8%	74	3.9%	66	--	--	--	--	--	53	--	0.2
Total Inflation-Linked Assets	0.6%	-16.8%	99	13.1%	99	2.4%	8	0.0	62	0.2%	47	1.0	-1.3
ASRS Custom Inflation-Linked Benchmark	--	-16.9%	99	12.7%	93	--	--	--	--	--	50	--	-1.3
Total Multi-Asset Class Strategies	3.1%	3.7%	1	8.3%	70	4.6%	54	-0.4	7	-3.2%	67	1.2	0.4
Multi-Asset Class Strategies Custom Benchmark	--	5.7%	1	5.8%	10	--	--	--	--	--	18	--	1.0

Note: Performance is reported net of fees.

Underlying composites do not add up to 100% because the chart excludes private market composites.

Ranks for statistics shown above are based on the respective universe against which the portfolio is ranked on the asset class performance summary that precedes this section of the analysis.

Rankings are from highest (1) to lowest (100) in the eVestment Universe.

Composition of Interim SAA Policy and ASRS Custom Benchmarks can be found in the appendix.

Arizona State Retirement System

Public Market Asset Class Analysis

5 Years Ending March 31, 2016

	% of Tot	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Rank	Info Ratio	Rank	Anlzd AJ	Rank	Beta	Sharpe Ratio
Total Fund	100.0%	7.1%	--	8.2%	--	1.2%	--	0.8	--	1.0%	--	1.0	0.9
Interim SAA Policy	--	6.2%	--	8.2%	--	--	--	--	--	--	--	--	0.7
Total Domestic and International Equity	49.5%	7.2%	--	13.1%	--	0.6%	--	-0.2	--	0.0%	--	1.0	0.5
ASRS Custom Total Equity Benchmark	--	7.3%	--	13.3%	--	--	--	--	--	--	--	--	0.5
Total Domestic Equity	26.2%	10.9%	16	12.8%	25	0.5%	3	-0.5	41	-0.3%	14	1.0	0.9
ASRS Custom Domestic Equity Benchmark	--	11.2%	3	12.8%	26	--	--	--	--	--	9	--	0.9
Total International Equity	21.7%	1.2%	70	15.2%	65	0.8%	1	-0.2	94	-0.1%	90	1.0	0.1
ASRS Custom Int'l Equity Benchmark	--	1.4%	65	15.6%	87	--	--	--	--	--	87	--	0.1
Total Public Markets Fixed Income	14.7%	3.6%	71	3.4%	48	0.7%	9	0.9	6	0.6%	48	1.0	1.0
ASRS Custom Public Markets Fixed Income Benchmark	--	3.0%	90	3.3%	43	--	--	--	--	--	78	--	0.9
Total Inflation-Linked Assets	0.6%	-13.1%	99	14.6%	99	2.4%	12	0.3	33	0.7%	50	1.0	-0.9
ASRS Custom Inflation-Linked Benchmark	--	-13.9%	99	14.6%	99	--	--	--	--	--	66	--	-1.0
Total Multi-Asset Class Strategies	3.1%	5.7%	12	9.0%	99	3.7%	56	-0.2	45	-1.2%	89	1.1	0.6
Multi-Asset Class Strategies Custom Benchmark	--	6.5%	1	7.7%	26	--	--	--	--	--	45	--	0.8

Note: Performance is reported net of fees.

Underlying composites do not add up to 100% because the chart excludes private market composites.

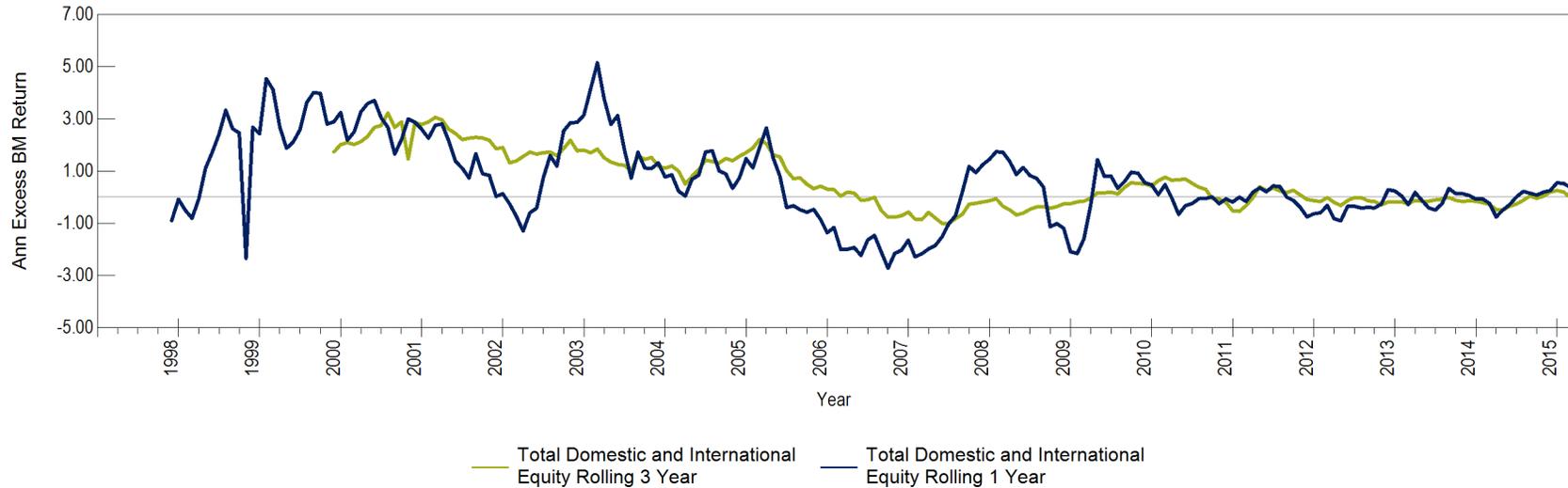
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Rankings are from highest (1) to lowest (100) in the eVestment Universe.

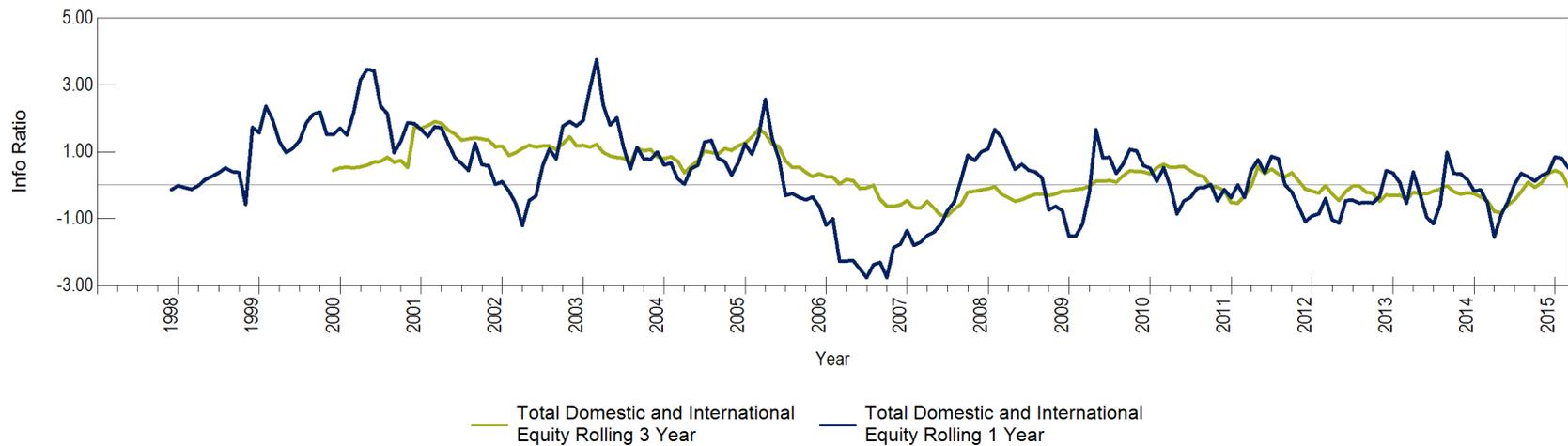
Composition of Interim SAA Policy and ASRS Custom Benchmarks can be found in the appendix.

Asset Class Analysis - Total Domestic and International Equity

Rolling Annual Excess Benchmark Return

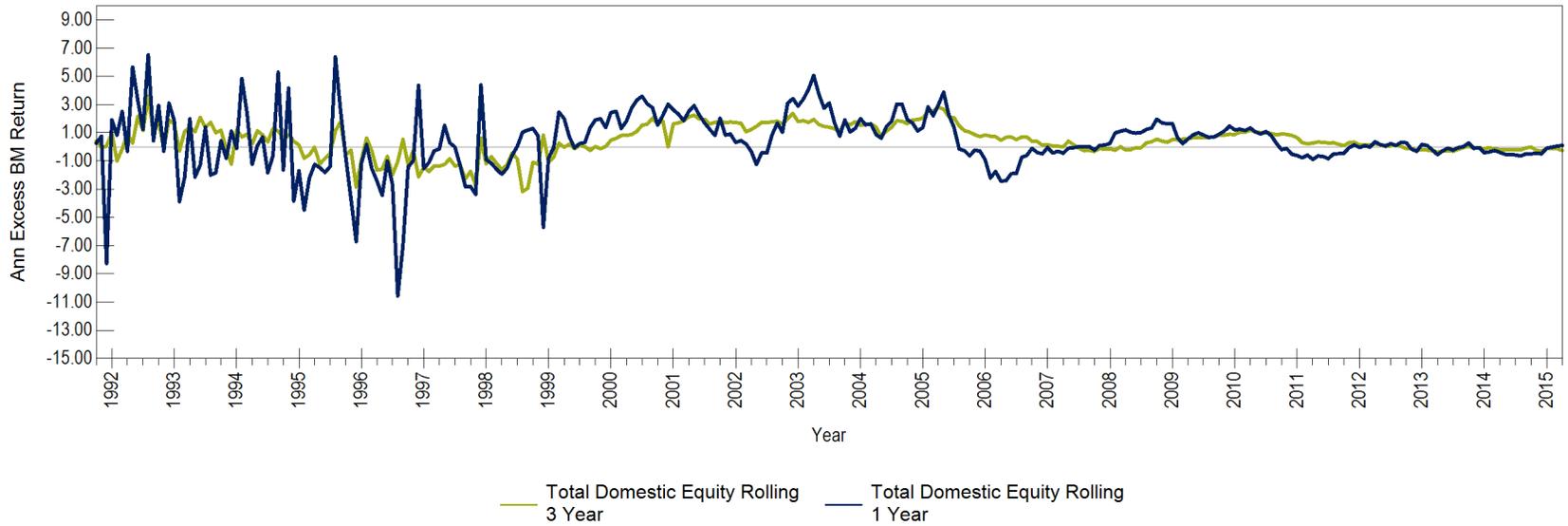


Rolling Information Ratio

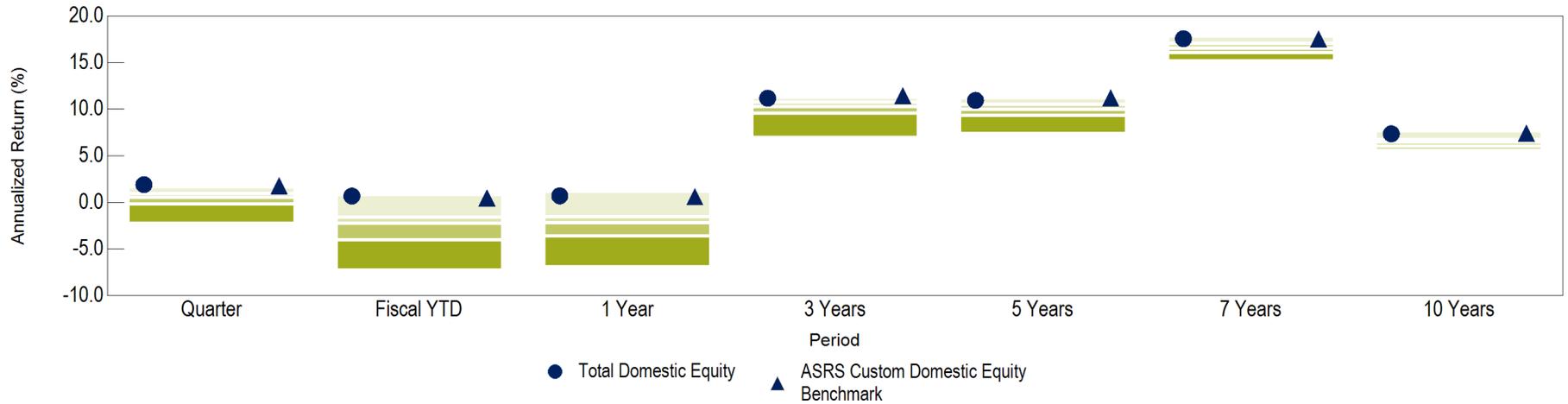


Asset Class Analysis - Total Domestic Equity

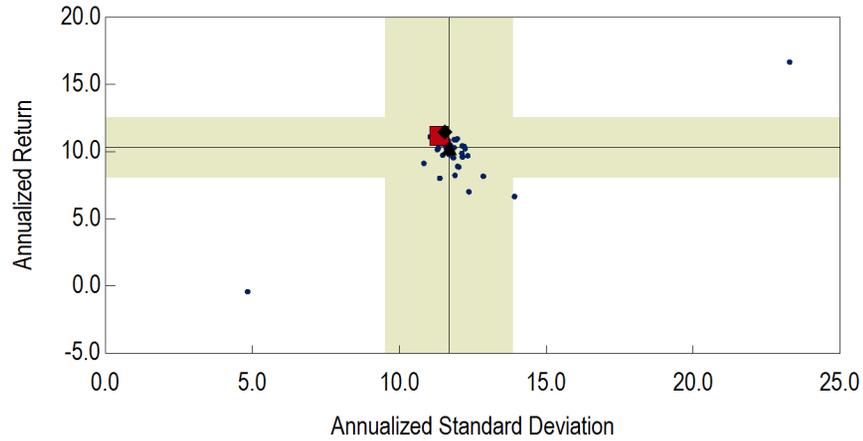
Rolling Annual Excess Benchmark Return



InvestorForce Public DB > \$1 Billion US Equity Net Accounts

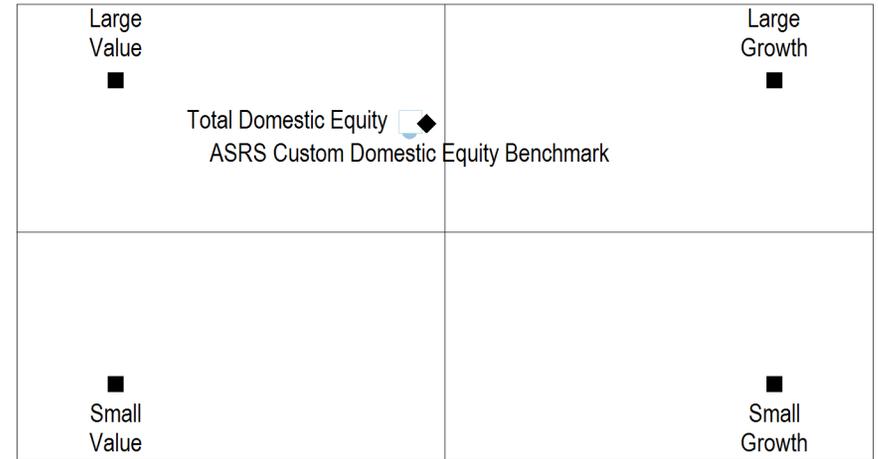


3 Year Risk Return

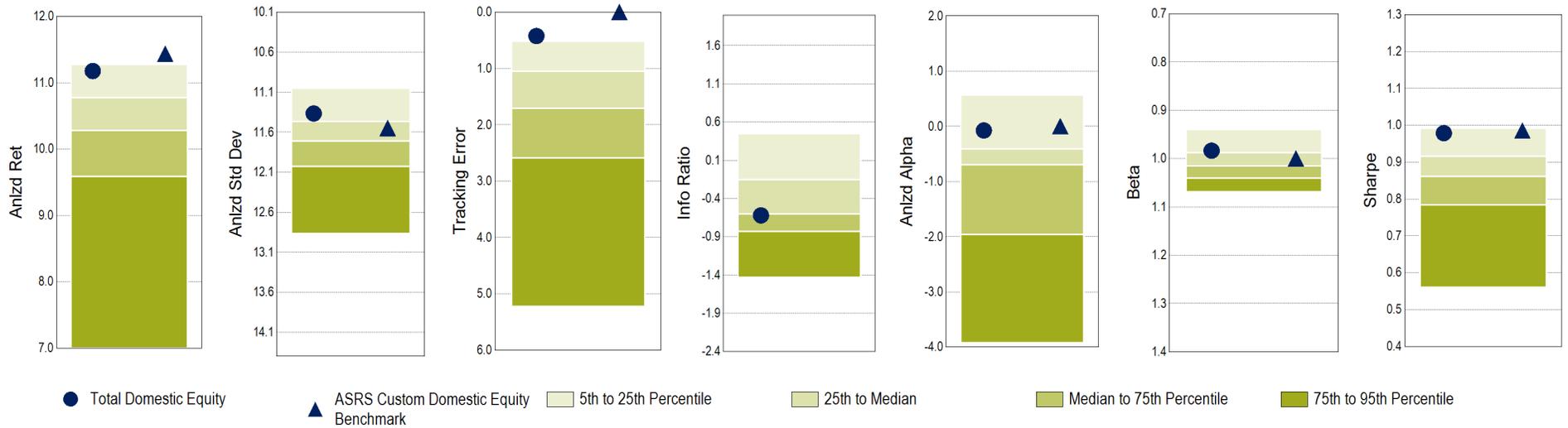


- Total Domestic Equity
- ◆ ASRS Custom Domestic Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion US Equity Net

3 Year Style Map

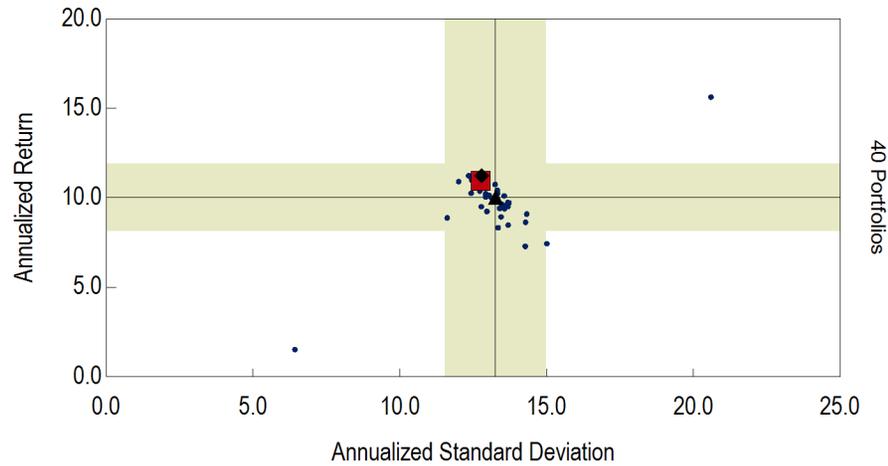


- First Rolling Period
- ◆ Last Rolling Period



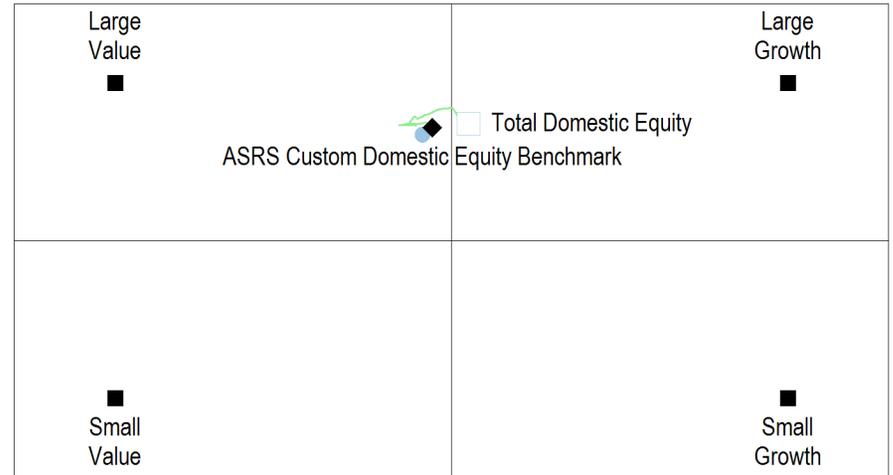
- Total Domestic Equity
- ▲ ASRS Custom Domestic Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

5 Year Risk Return

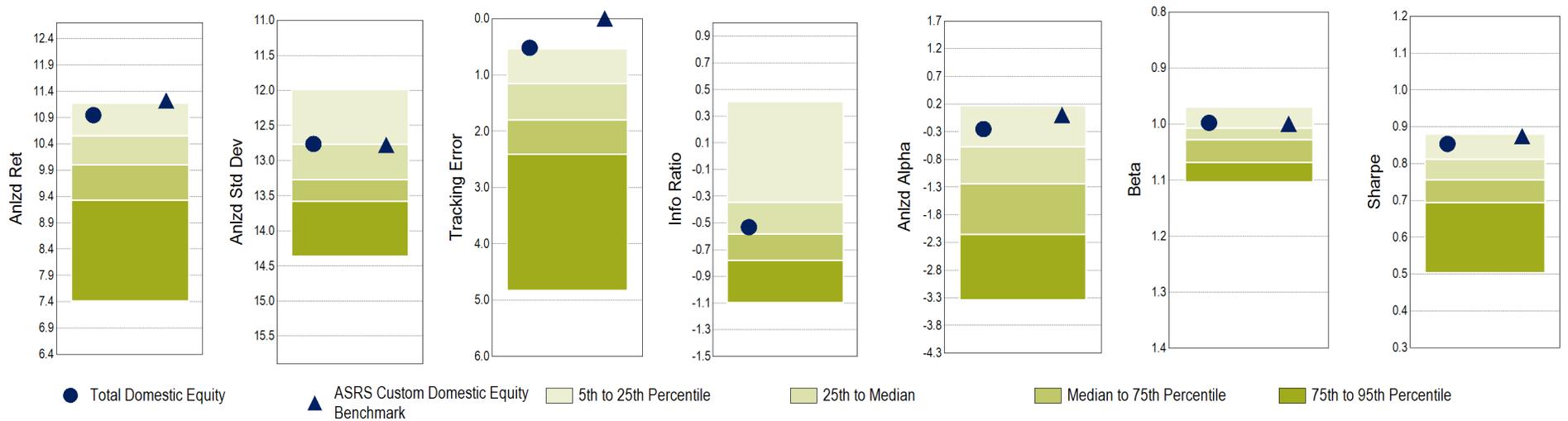


- Total Domestic Equity
- ◆ ASRS Custom Domestic Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion US Equity Net

5 Year Style Map



- First Rolling Period
- ◆ Last Rolling Period



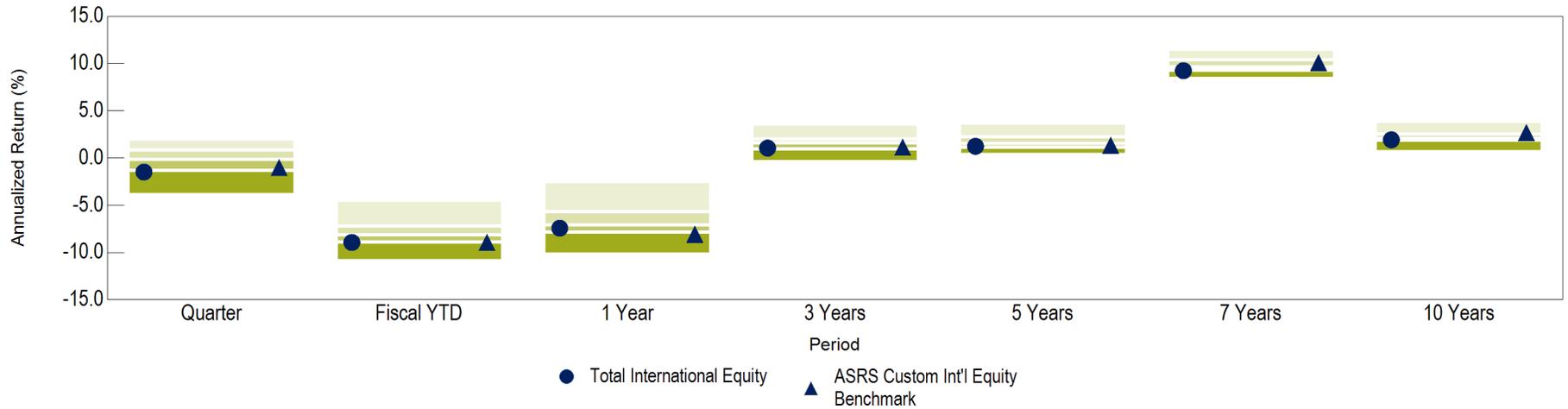
- Total Domestic Equity
- ▲ ASRS Custom Domestic Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

Asset Class Analysis - Total International Equity

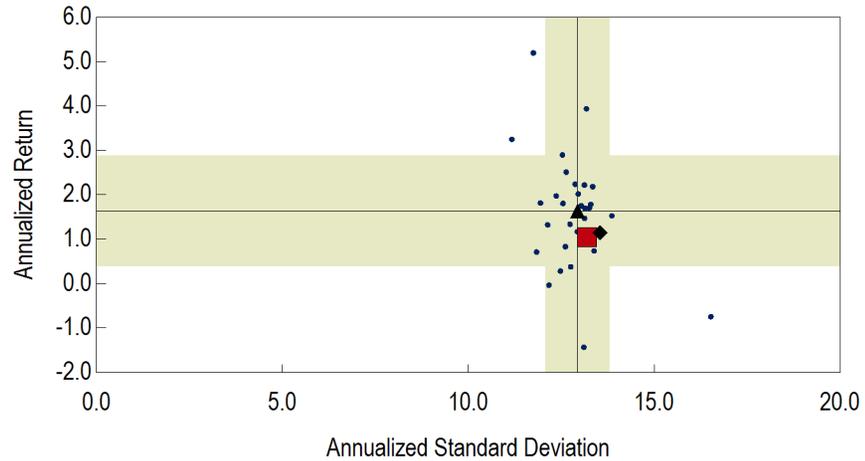
Rolling Annual Excess Benchmark Return



InvestorForce Public DB > \$1 Billion Global ex-US Equity Net Accounts

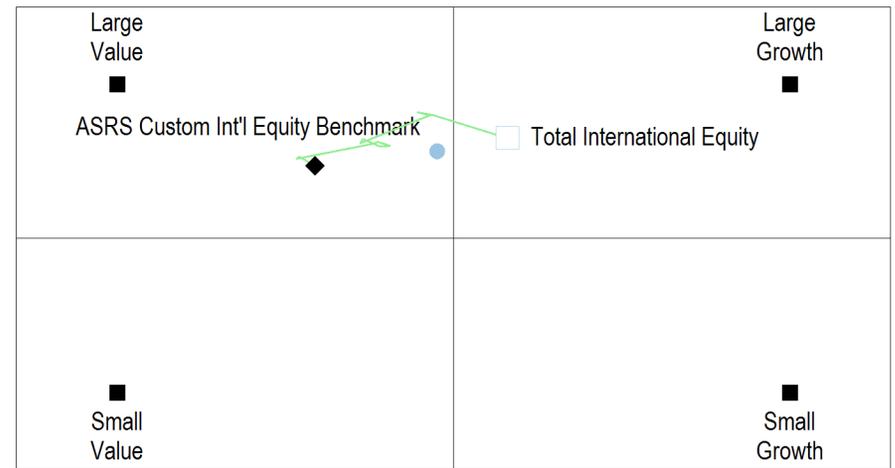


3 Year Risk Return

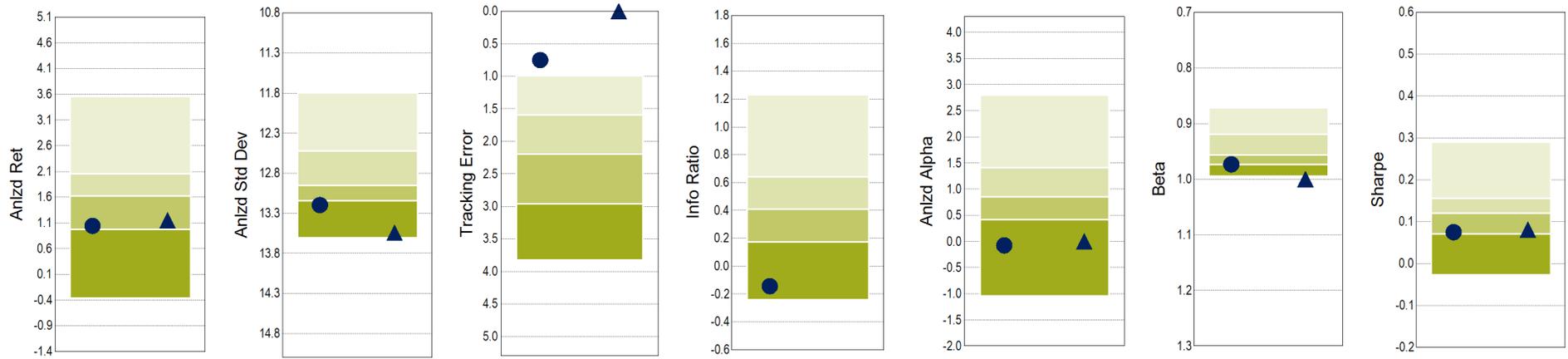


- Total International Equity
- ◆ ASRS Custom Int'l Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Global ex-US Equity Net

3 Year Style Map

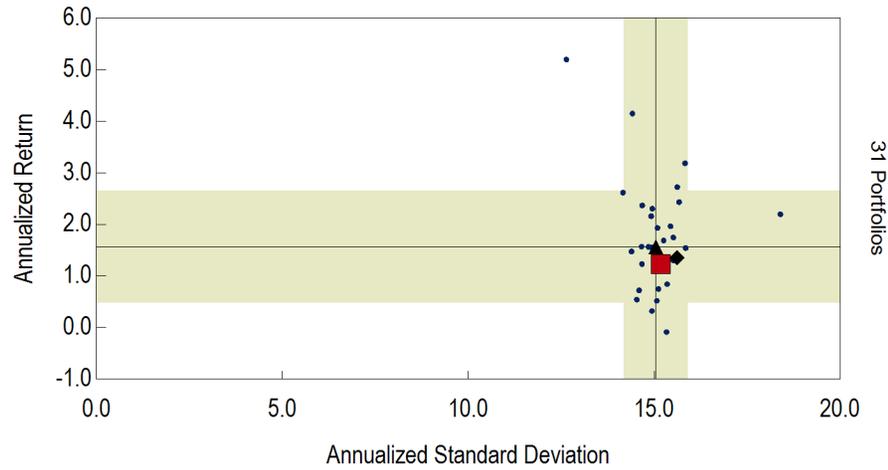


- First Rolling Period
- ◆ Last Rolling Period



- Total International Equity
- ▲ ASRS Custom Int'l Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

5 Year Risk Return

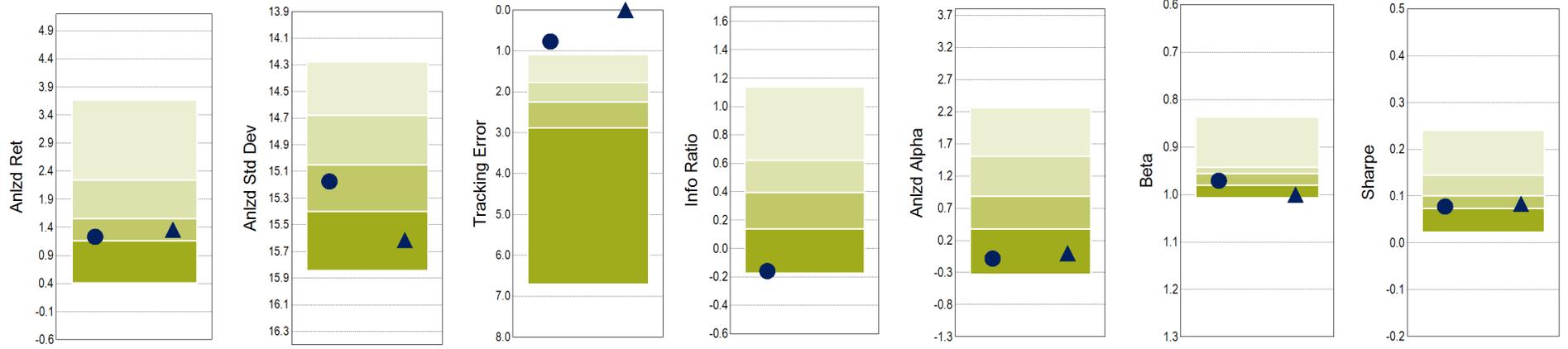


- Total International Equity
- ◆ ASRS Custom Int'l Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Global ex-US Equity Net

5 Year Style Map



- First Rolling Period
- ◆ Last Rolling Period

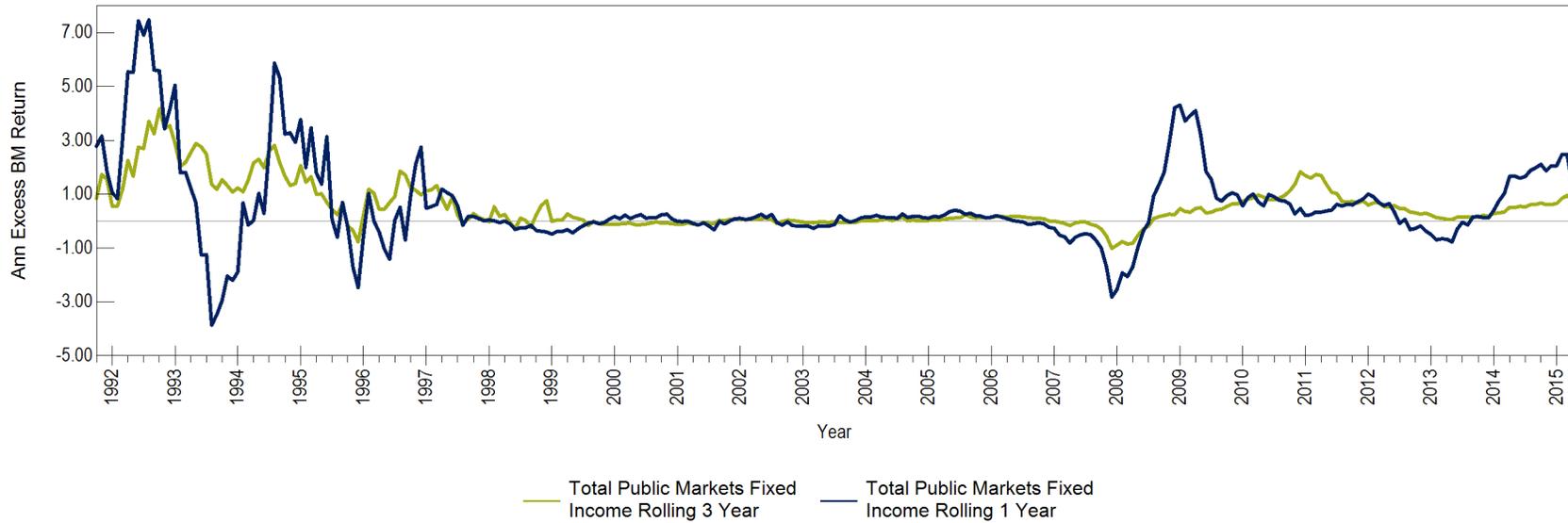


- Total International Equity
- ▲ ASRS Custom Int'l Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



Asset Class Analysis - Total Public Markets Fixed Income

Rolling Annual Excess Benchmark Return

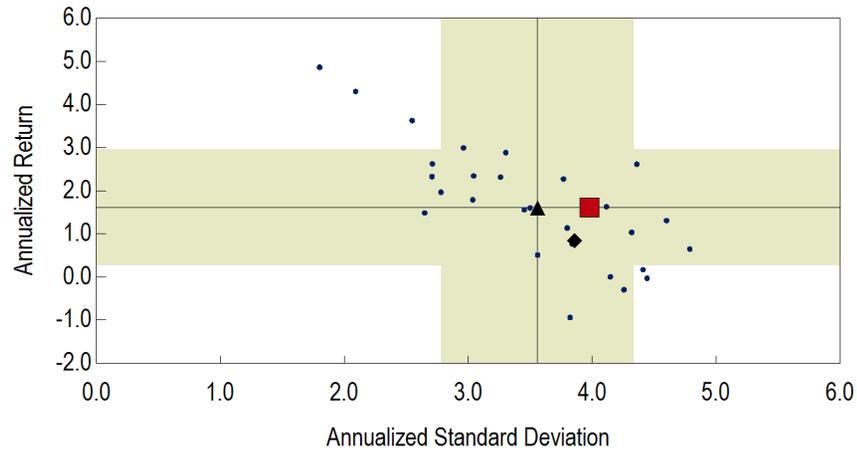


InvestorForce Public DB > \$1 Billion Fixed Income Net Accounts



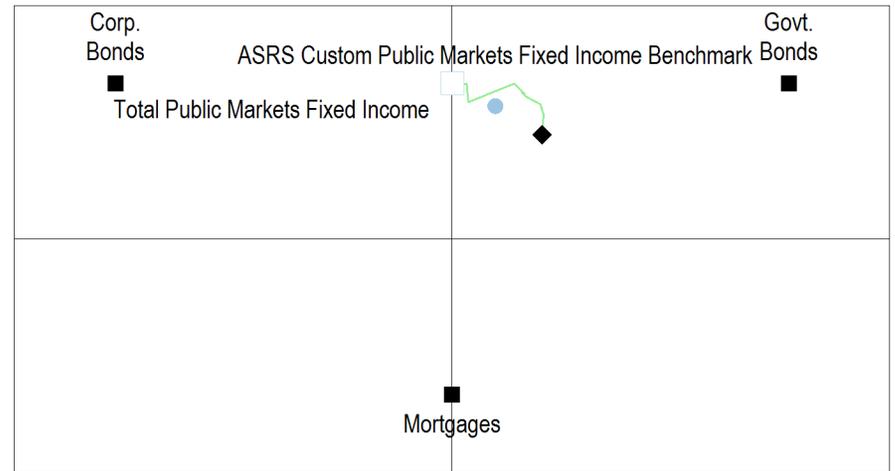
Asset Class Analysis - Total Public Markets Fixed Income

3 Year Risk Return

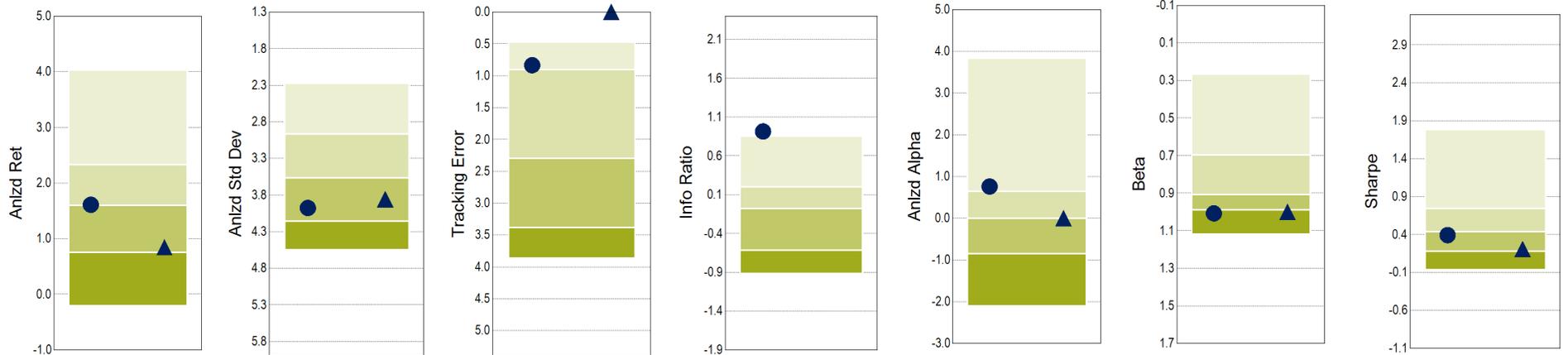


- Total Public Markets Fixed Income
- ◆ ASRS Custom Public Markets Fixed Income Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Fixed Income Net

3 Year Style Map

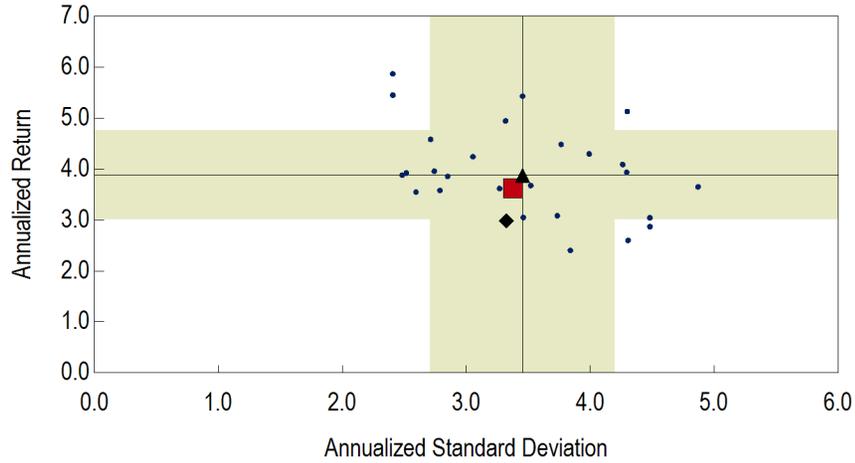


- First Rolling Period
- ◆ Last Rolling Period



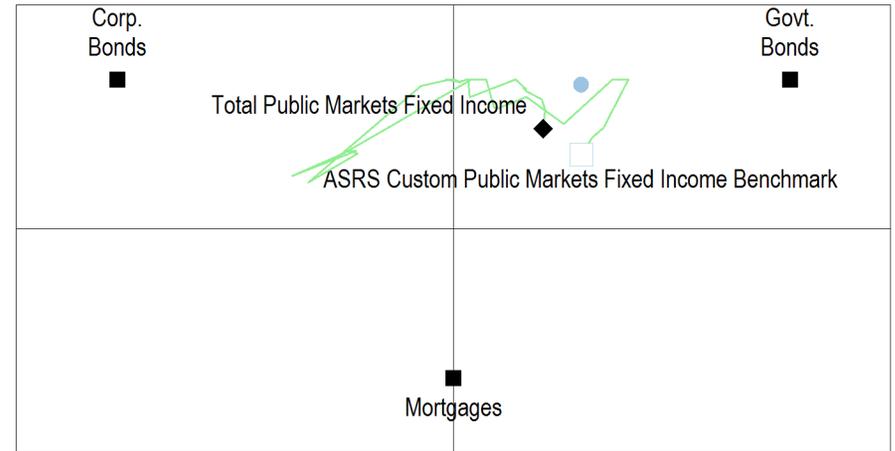
- Total Public Markets Fixed Income
- ▲ ASRS Custom Public Markets Fixed Income Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

5 Year Risk Return

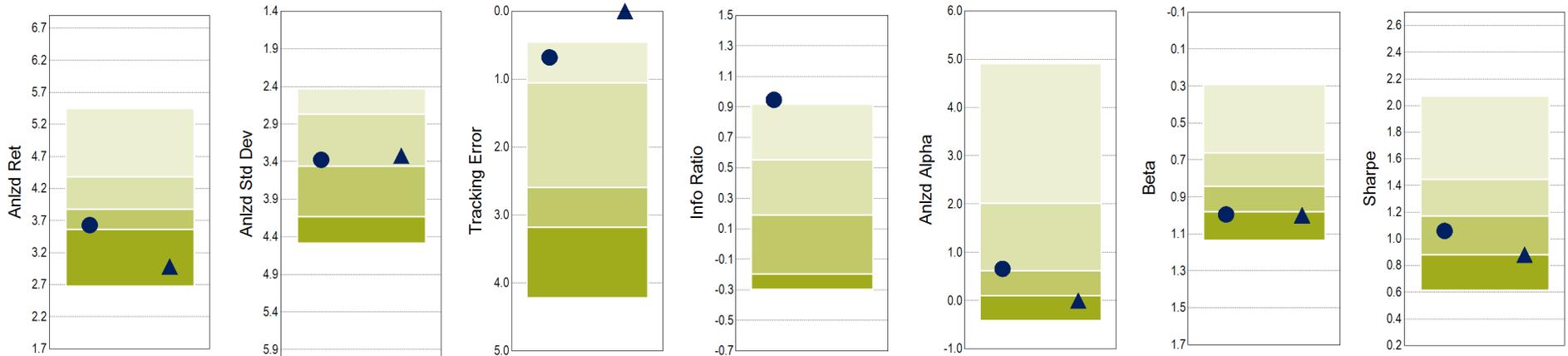


- Total Public Markets Fixed Income
- ◆ ASRS Custom Public Markets Fixed Income Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Fixed Income Net

5 Year Style Map



- First Rolling Period
- ◆ Last Rolling Period

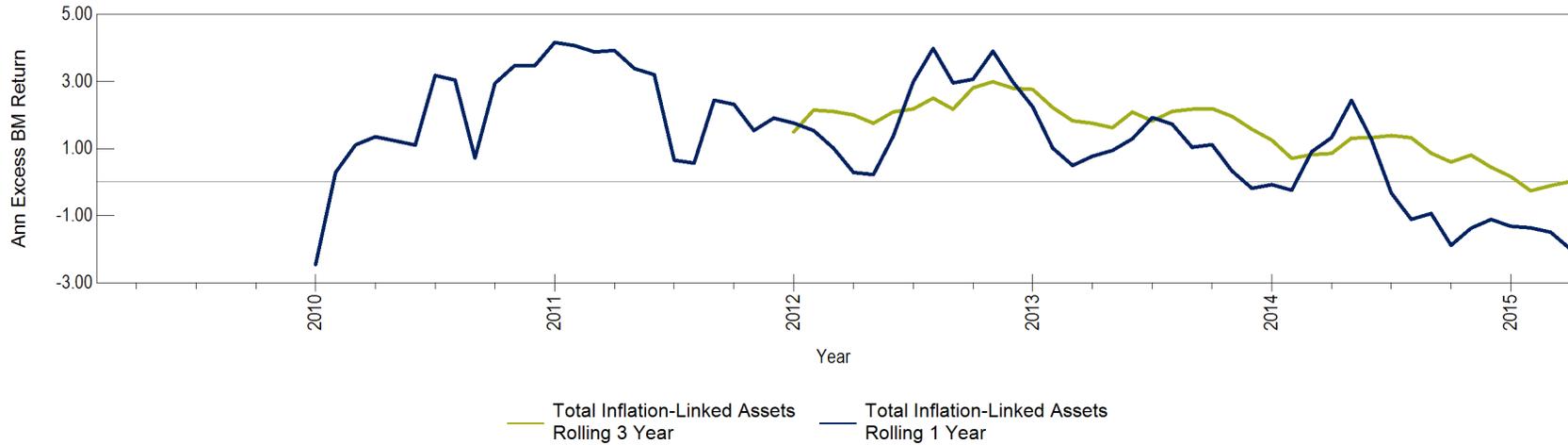


- Total Public Markets Fixed Income
- ▲ ASRS Custom Public Markets Fixed Income Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

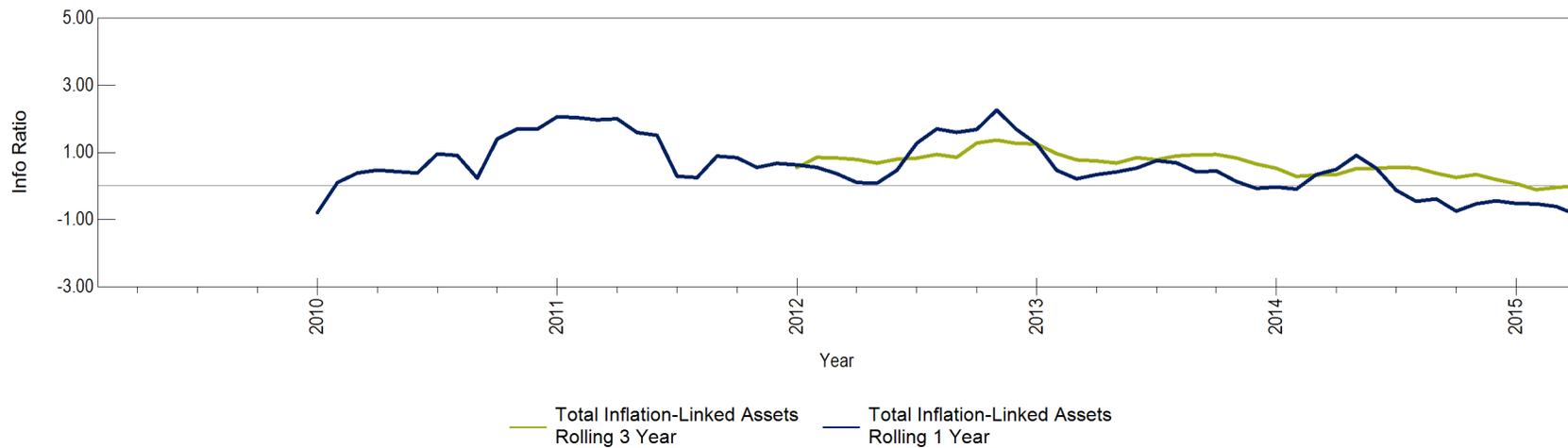


Asset Class Analysis - Total Inflation-Linked Assets

Rolling Annual Excess Benchmark Return

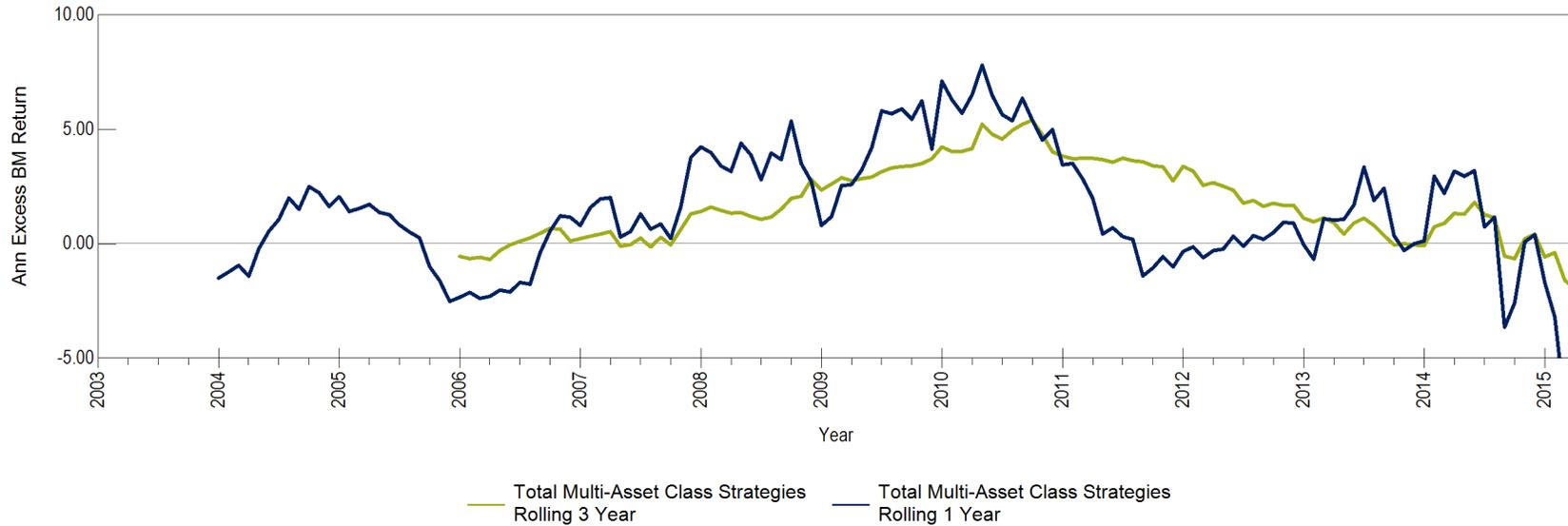


Rolling Information Ratio

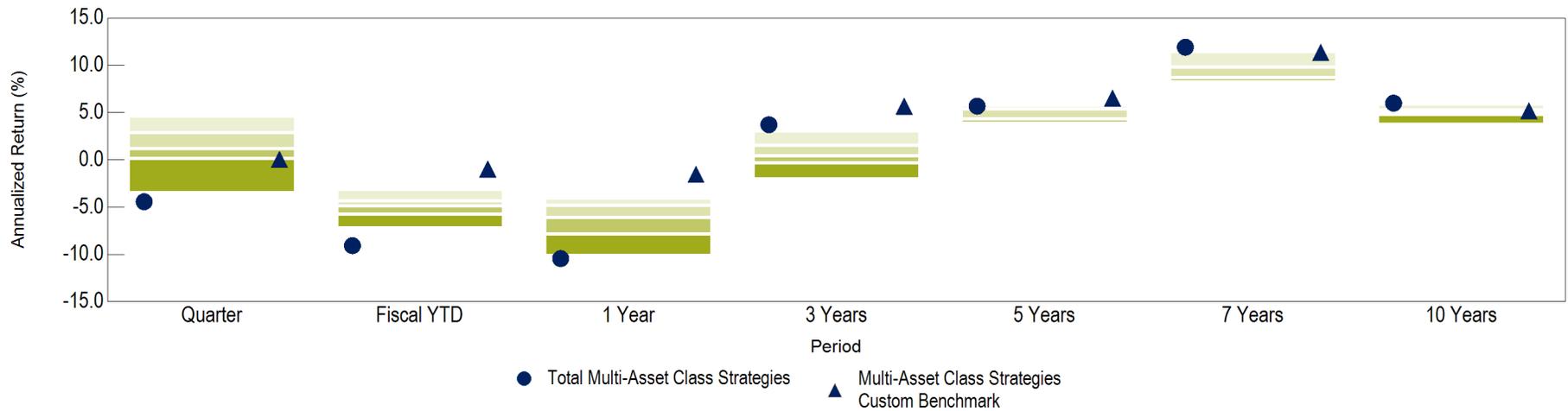


Asset Class Analysis - Total Multi-Asset Class Strategies

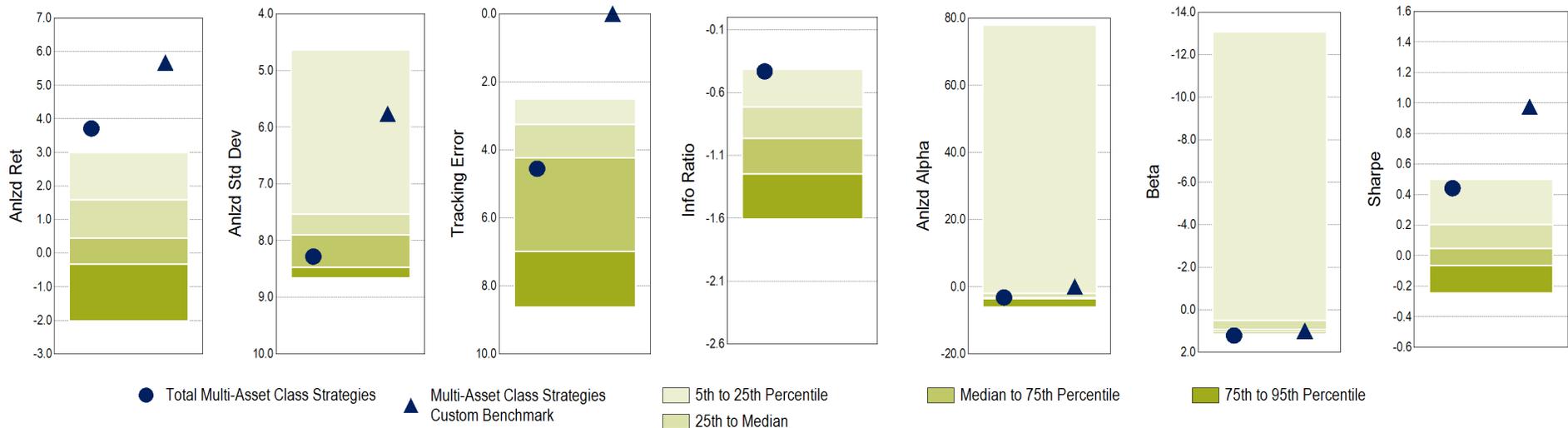
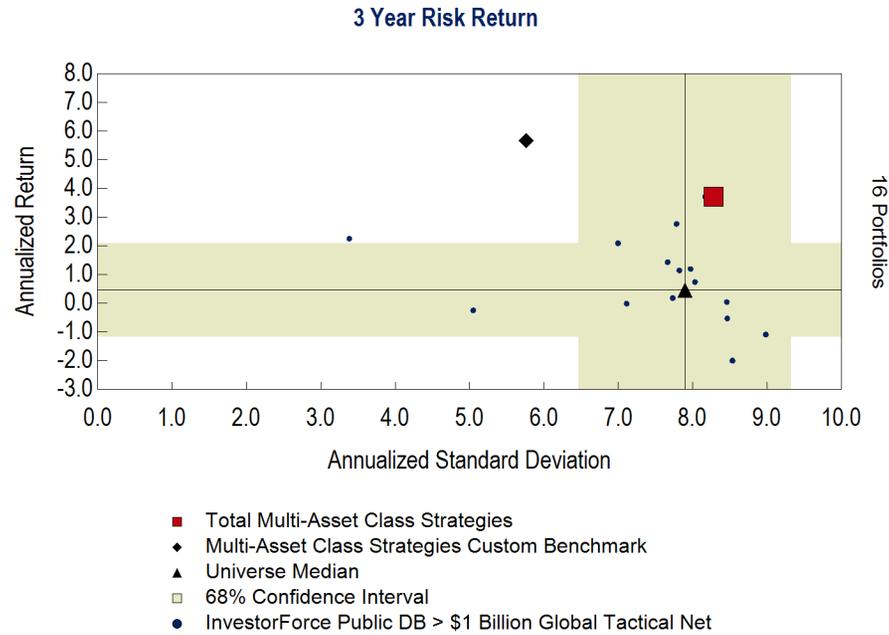
Rolling Annual Excess Benchmark Return



InvestorForce Public DB > \$1 Billion Global Tactical Net Accounts

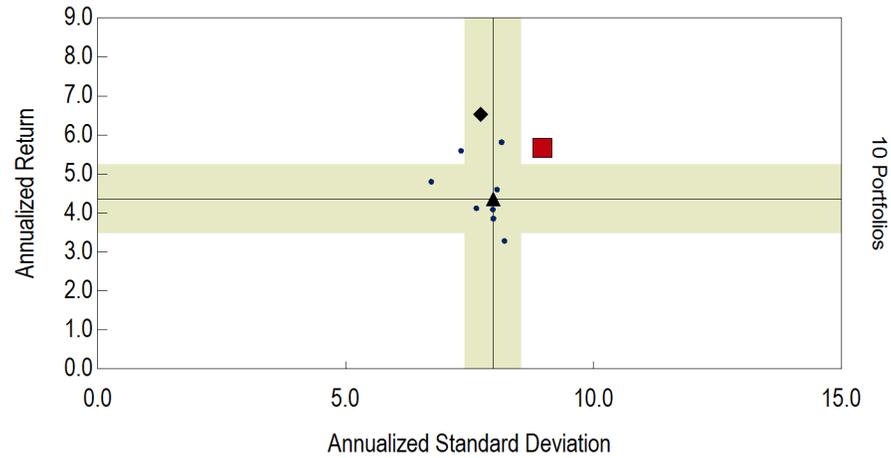


Asset Class Analysis - Total Multi-Asset Class Strategies

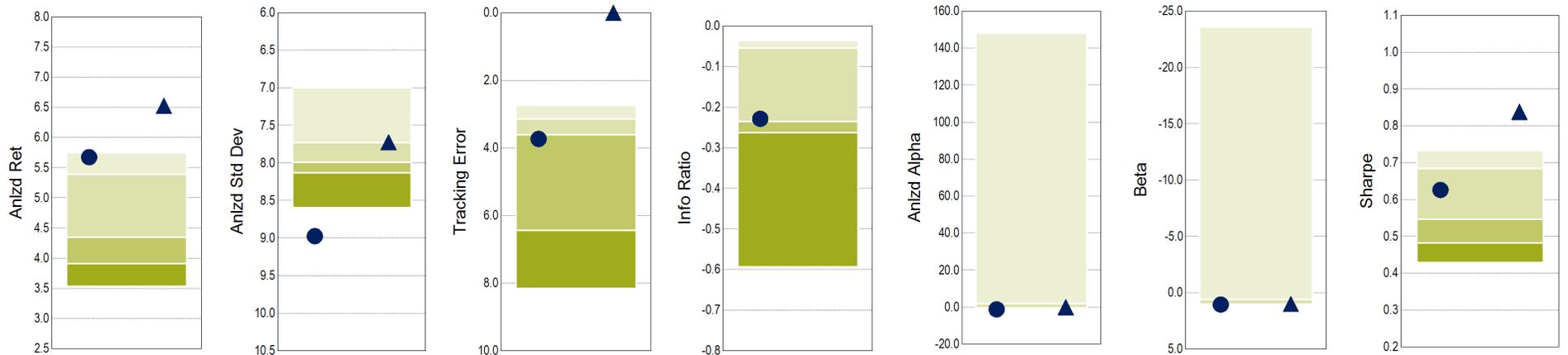


Asset Class Analysis - Total Multi-Asset Class Strategies

5 Year Risk Return



- Total Multi-Asset Class Strategies
- ◆ Multi-Asset Class Strategies Custom Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Global Tactical Net



- Total Multi-Asset Class Strategies
- ▲ Multi-Asset Class Strategies...
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile

- **Two Asset Class Committee meetings have been held since the last time we provided an update on the ASRS Asset Class Committee Meetings.**
- **April 22, 2016- Private Markets Committee**
 - Monthly Status Report, General Discussion and Deal Flow
 - Private Equity Manager Recommendation (\$40 million commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
 - The ASRS has invested with this manager in a prior fund.
 - Amendment to project expenditures Recommendation (\$30 million commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
 - Expenditure is to expand a multi-unit building resulting in accretion to IRR.
- **May 2, 2016- Public Markets Committee**
 - Opportunistic Debt Manager Recommendation (\$300 million commitment)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

- **May 26, 2016- Private Markets Committee**

- Monthly Status Report, General Discussion and Deal Flow
- Private Equity Manager Recommendation (\$30 million commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
 - The ASRS has invested with this manager in a prior fund.

General Observations

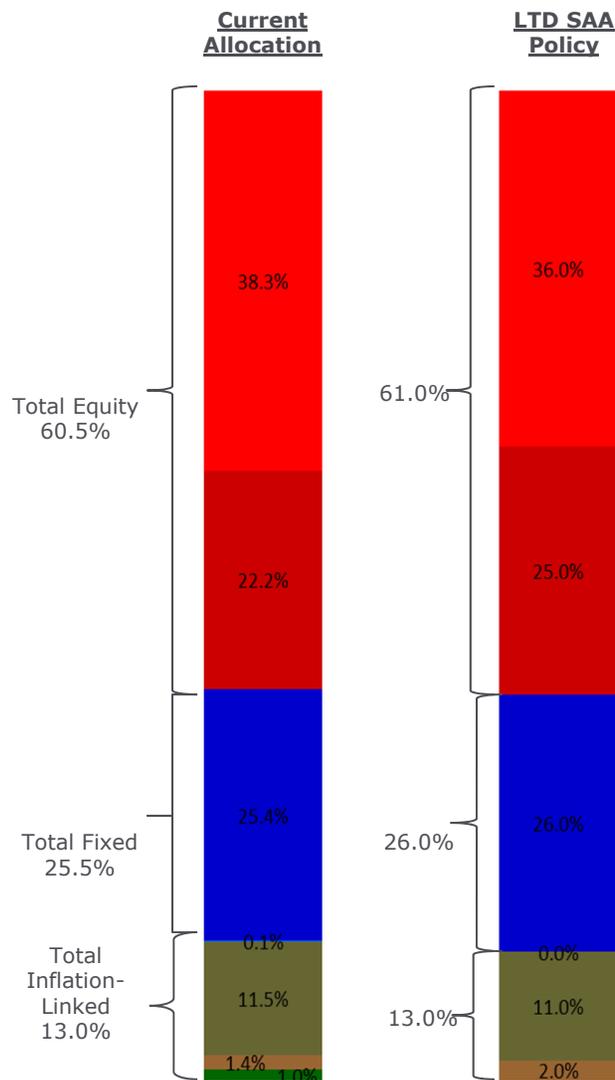
- **The Fund continues to make significant progress moving the portfolio from the Interim SAAP toward the long-term SAAP. New long-term SAAP adopted as of April 1, 2015.**
 - Current Interim SAAP includes proration of 3% Private Debt and 2% Real Estate, which are unfunded.
 - Continued build out of private markets asset classes provides opportunity to take advantage of illiquidity premium to produce expected returns in excess of what we believe can be achieved in the public markets.
- **IMD has already taken significant steps to move the Fund toward implementation of the recently approved SAAP.**
 - The largest single underweight position in the Fund is Private Debt, which was increased from a 3% SAAP target to a 10% SAAP target with an 8% - 12% range (current actual is 7.3%).
 - \$5.1 billion in commitments to private debt strategies equates to approximately 15.2% of Total Fund assets vs. the SAAP target of 10%.
 - Multi-Asset Class Strategies (formerly GTAA) has been restructured and moved 'above the line', and now has an explicit 5% target within the SAAP.
- **Tactical positioning in Public Markets Fixed Income and Inflation-Linked Assets has added significant value (nearly half of the outperformance) over the past 5 years.**
- **ASRS Private Markets programs have added significant value at the Total Fund level over the three- and five-year time periods.**
- **Volatility is being realized across markets; Long Treasuries mandate funded in August 2015 to mitigate volatility has realized some very positive gains (+8.1%) in Q1.**
- **Tactical positioning consistent with IMD House Views.**

Independent Oversight/Compliance: LTD

Note: All of the data shown on the following pages is as of March 31, 2016 and reflects the deduction of investment manager fees, unless otherwise noted.



Long Term Disability SAAP Policy Compliance



	Current Mkt Value	Current Allocation	LTD SAAP	Difference
U.S. Equity	\$77,877,534	38.3%	36.0%	2.3%
U.S. Large Cap	\$49,488,141	24.4%	24.0%	0.4%
U.S. Small Cap	\$28,389,393	14.0%	12.0%	2.0%
International Equity	\$44,993,335	22.2%	25.0%	-2.8%
Developed Large Cap	\$30,382,587	15.0%	18.0%	-3.0%
Developed Small Cap	\$4,004,610	2.0%	2.0%	0.0%
Emerging Markets	\$10,606,138	5.2%	5.0%	0.2%
Total Equity	\$122,870,869	60.5%	61.0%	-0.5%
U.S. Fixed Income	\$51,629,321	25.4%	26.0%	-0.6%
Core	\$37,170,461	18.3%	19.0%	-0.7%
High Yield	\$14,458,860	7.1%	7.0%	0.1%
Emerging Market Debt	\$127,273	0.1%	0.0%	0.1%
Total Fixed Income	\$51,756,594	25.5%	26.0%	-0.5%
Real Estate	\$23,404,187	11.5%	11.0%	0.5%
Commodities	\$2,936,113	1.4%	2.0%	-0.6%
Total Inflation-Linked	\$26,340,300	13.0%	13.0%	0.0%
Cash¹	\$2,108,865	1.0%	0.0%	1.0%
Total	\$203,076,626	100.0%	100.0%	0.0%

¹Cash includes money for the upcoming monthly pension distribution.

Note: Market values include manager held cash.

ASRS LTD rebalanced to the new SAA Policy in February 2016, with an effective date of 2/18/2016.

Long Term Disability Performance Summary

	Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception (July-02)
Long Term Disability	1.4%	-2.5%	5.4%	6.2%	4.5%	6.1%
LTD SAA Policy ¹	1.7%	-2.6%	5.1%	6.0%	5.0%	6.3%
Excess Return	-0.3%	0.1%	0.3%	0.2%	-0.5%	-0.2%

¹LTD SAA Policy composition can be found in the appendix.

Market Environment Update and Outlook

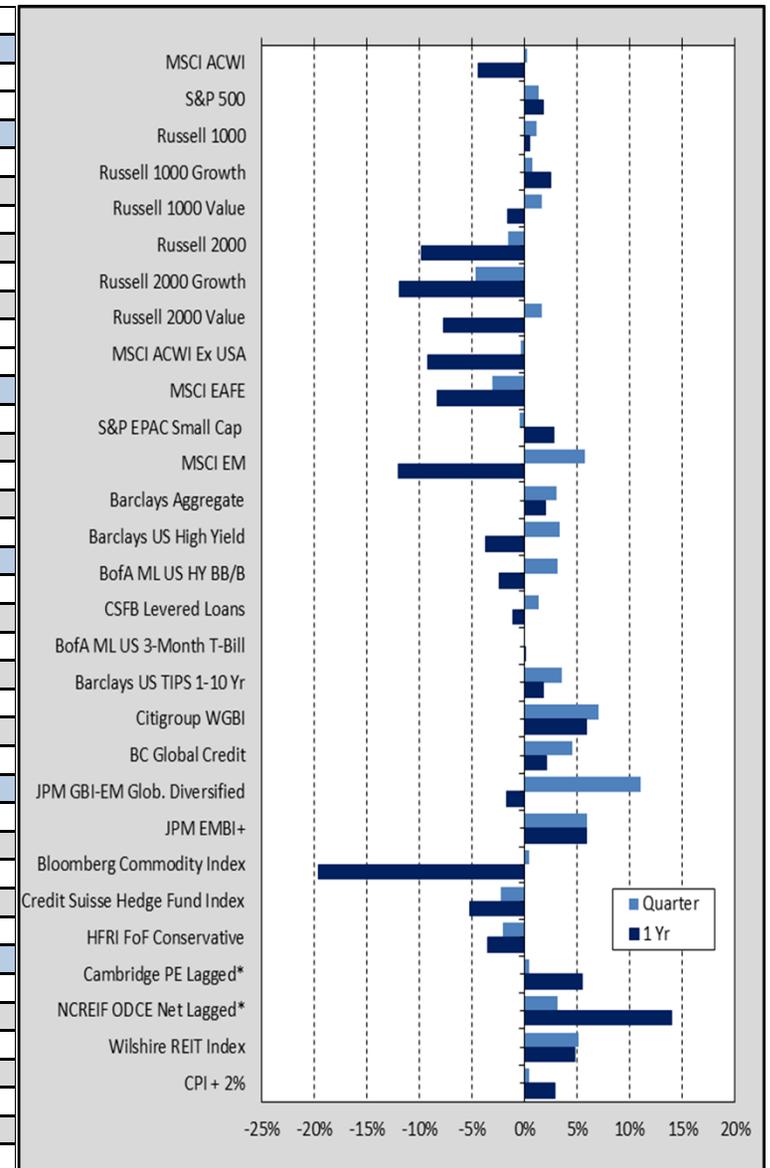


Economic Environment

- **First quarter GDP growth rate (advance estimate) printed at a meager 0.5%.**
 - Retail sales ended February at +3.1% on a year-over-year growth rate basis. In the same period last year the YoY growth rate was 1.2%.
 - The inventory-to-sales ratio ended February was flat at 1.4 and has remained relatively flat since early 2010.
 - Corporate profits (ended October) as a percent of GDP declined slightly to 9.3% from 9.9% and remain elevated relative to historical levels.
 - The U.S. trade deficit widened 2.6% in February due to increased imports.
- **The unemployment rate remained unchanged at 5.0% in Q1; U-6, a broader measure of unemployment, fell to 9.8% during the first quarter.**
- **The Case-Shiller Home Price Index (ended January) increased slightly to 175.4 from 175.3 September and is at levels higher than that of pre-financial crisis levels of 150.9.**
- **Rolling 12-month seasonally adjusted CPI increased to 0.8% from 0.06% at the end of December; Capacity Utilization decreased to 74.8 in March from 75.4% in December.**
- **Fed Funds rate was unchanged at 0.50%. The 10-year Treasury Yield (constant maturity) finished Q1 at 1.9% down from 2.2% ended December.**
- **The Fed balance sheet decreased slightly during Q1 2016, while the European Central Bank balance sheet continues to increase.**
 - ECB cut interest rates to -0.4% and expanded asset purchases from €60 billion to €80 billion per month.
- **S&P valuations decreased in March remaining above the 10-year and long-term averages**
 - Cyclically adjusted Shiller PE ratio (25.38x) is above the long-term average of 16.6x and above the 10-year average of 22.8x.
- **Global currencies strengthened against the dollar amid commodity price stabilization and investor confidence.**

Market Environment – Q1 2016 Overview

		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
World Equity Benchmarks						
MSCI ACWI	World	0.2%	-4.3%	5.5%	5.2%	4.1%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Domestic Equity Benchmarks						
S&P 500	Large Core	1.3%	1.8%	11.8%	11.6%	7.0%
Russell 1000	Large Core	1.2%	0.5%	11.5%	11.4%	7.1%
Russell 1000 Growth	Large Growth	0.7%	2.5%	13.6%	12.4%	8.3%
Russell 1000 Value	Large Value	1.6%	-1.5%	9.4%	10.2%	5.7%
Russell 2000	Small Core	-1.5%	-9.8%	6.8%	7.2%	5.3%
Russell 2000 Growth	Small Growth	-4.7%	-11.8%	7.9%	7.7%	6.0%
Russell 2000 Value	Small Value	1.7%	-7.7%	5.7%	6.7%	4.4%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
International Equity Benchmarks						
MSCI ACWI Ex USA	World ex-US	-0.4%	-9.2%	0.3%	0.3%	1.9%
MSCI EAFE	Int'l Developed	-3.0%	-8.3%	2.2%	2.3%	1.8%
S&P EPAC Small Cap	Small Cap Int'l	-0.4%	2.8%	7.9%	5.9%	4.5%
MSCI EM	Emerging Equity	5.7%	-12.0%	-4.5%	-4.1%	3.0%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Domestic Fixed Income Benchmarks						
Barclays Aggregate	Core Bonds	3.0%	2.0%	2.5%	3.8%	4.9%
Barclays US High Yield	High Yield	3.4%	-3.7%	1.8%	4.9%	7.0%
BofA ML US HY BB/B	High Yield	3.1%	-2.4%	2.5%	5.2%	6.5%
CSFB Levered Loans	Bank Loans	1.3%	-1.1%	2.2%	3.5%	4.0%
BofA ML US 3-Month T-Bill	Cash	0.1%	0.1%	0.1%	0.1%	1.1%
Barclays US TIPS 1-10 Yr	Inflation	3.6%	1.8%	-0.7%	1.9%	4.0%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Global Fixed Income Benchmarks						
Citigroup WGBI	World Gov. Bonds	7.1%	5.9%	0.5%	1.2%	4.2%
BC Global Credit	Global Bonds	4.6%	2.1%	1.6%	3.3%	4.8%
JPM GBI-EM Glob. Diversified	Em. Mkt. Bonds (Local)	11.0%	-1.6%	-6.7%	-2.0%	5.0%
JPM EMBI+	Em. Mkt. Bonds	5.9%	5.9%	2.8%	6.1%	7.1%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Alternative Benchmarks						
Bloomberg Commodity Index	Commodity	0.4%	-19.6%	-16.9%	-14.1%	-6.2%
Credit Suisse Hedge Fund Index	Hedge Fund	-2.2%	-5.2%	2.4%	2.7%	4.2%
HFRI FoF Conservative	Fund of Funds	-2.0%	-3.5%	2.1%	1.7%	1.4%
Cambridge PE Lagged*	Private Equity	0.4%	5.5%	12.5%	12.5%	11.4%
NCREIF ODCE Net Lagged*	Real Estate	3.1%	14.0%	12.8%	12.6%	5.6%
Wilshire REIT Index	REIT	5.2%	4.8%	11.1%	12.1%	6.3%
CPI + 2%	Inflation/Real Assets	0.4%	2.9%	2.8%	3.3%	3.8%



* As of 12/31/2015

Global Equity

- **U.S. equities posted modest gains in the first quarter (+1.3%) rallying in March from a rocky beginning to 2016.**
- **Small cap stocks underperformed large cap stocks during the quarter, with the Russell 2000 Index returning -1.5% and the Russell 1000 Index returning 1.2%.**
- **International equities underperformed U.S. markets during the quarter, returning -0.4%, as measured by the MSCI ACWI ex-U.S. Index. Emerging markets returned 5.7% as measured by the MSCI Emerging Markets Index in U.S. dollar terms.**
 - Developed international markets returned -3.0% as measured by the MSCI EAFE Index.

Private Equity

- **Private equity fundraising totaled \$130.5 billion in Q1 2016.**
- **Buyout and Special Situations fundraising totaled \$48.1 billion in Q1 2016.**
 - 55% of fundraising activity was in North America, 42% in Europe and 2.7% in Asia/Emerging Markets.
- **Venture capital fundraising totaled \$9.2 billion.**
 - VC fundraising as a percent of total new PE funds is in line with historical post-dot com levels at approximately 14%.
- **Fund of fund and multi-manager co-investment fundraising totaled \$7.8 billion.**
- **Growth equity fundraising totaled \$3.4 billion.**

Fixed Income

- **The yield curve shifted down for maturities greater than 6 months. Intermediate yields decreased 44-49 basis points and long duration yields decreased 40 basis points.**
- **The spread between two and 10-year rates decreased to 105 basis points from 121 basis points ended March. Treasury Inflation-Protected Securities, or TIPS, returned +3.6% during the quarter, as measured by the Barclays US TIPS 1-10 Yr Index.**
- **The Barclays Long Duration Credit Index gained +6.82% as the long end of the curve ended the quarter 40 basis points lower.**
- **Long Treasuries gained +8.49% and investment-grade corporate debt gained 3.03%.**
- **The Barclays 1-3 year Government/ Credit Index returned +0.97% and US high yield bonds gained +3.4%.**
- **Emerging markets debt gained broadly and were especially pronounced in local currency as relative dollar weakness spurred strong gains.**
 - US dollar-denominated debt, as measured by the JP Morgan EMBI Index, gained 5.9%; local currency debt gained +11.0%, according to the JP Morgan GBI-EM Index.

Real Assets/Inflation-Linked Assets

- **Massive energy market dislocation.**
 - Seek inflation sensitive asset classes that offer positive yield
 - Oil prices stabilizing and remain low.
 - Private equity and private debt opportunities may be relatively attractive.
 - Potential for public stressed/distressed credit, equity and commodity plays.
- **OPEC, Saudi Arabia and oil producing countries continue to show a willingness to allow lower oil prices to persist in efforts to cement market share and reduce marginal supply.**
- **Select infrastructure opportunities showing signs of being attractive.**
 - Target opportunistic strategies in niche sub-sectors to take advantage of market dislocations.
 - Secular opportunities may exist within the shipping industry as traditional financing sources (both debt and equity) are less abundant
- **Timber opportunities remain elusive.**
 - Income yields (net) are low as assets are predominantly traded between like-minded institutions
 - Private strategies are illiquid and constrain quick entrance/exit (i.e. long-term lock-up)
 - Liquid strategies have limited pure timber exposure (and limited active-play options)

Commodities

- **Commodities ended quarter with a meager +0.51% as measured by the Bloomberg Commodity Index.**
 - Volatility continued in oil markets as price discovery continues into 2016 with oil reaching multi-year lows in February preceding a rebound in March.
 - Precious metals were the best performing group appreciating nearly 9.5% on average.

Real Estate

- **NEPC continues to be neutral on core real estate in the US and remains positive on non-core real estate, that is, value-add and opportunistic strategies.**
- **Within U.S. core real estate, strong fundamentals continue to be the story along with attractive income spreads relative to interest rates.**
 - Real estate fundamentals and debt terms are attractive, however valuations are high and the possibility of rising interest rates and the impact on cap rates causes concern.
- **Overall, the non-core real estate investment environment in the U.S. is normalizing; however, select areas remain attractive.**
- **Europe is viewed as the best place for a marginal dollar of non-core real estate investment.**
 - Europe is emerging from multi-year recession, but recovery is slow and uneven with global markets experiencing large capital inflows.
 - Banks in EU are still overleveraged and have significant real estate exposure to jettison.

Highlights of First Quarter Happenings at NEPC

NEPC Research

Recent White Papers

- 2016 First Quarter Market Thoughts
- Market Chatter: Is it really All About China? (January 2016)
- Market Chatter: Monetary Policy Divergence and Developed Currency (April 2016)

Upcoming Events

- 'Opportunities for Future Investments' is the theme for NEPC's 21st Annual Investment Conference – May 10-11, 2016 at the Hynes Convention Center in Boston, MA. Keynote Speakers are:
 - Michael Cembalest, Chairman of Market and Investment Strategy, J.P. Morgan Asset Management
 - Dr. Dambisa Moyo, Global Economist and Author
- Register at www.NEPC.com

NEPC Client Recognitions

We are excited to announce that three of NEPC's clients were nominated for the 2016 "Chief Investment Officer of the Year" Investor Intelligence Award. The winners will be announced at Institutional Investor's annual Roundtable for Public Funds, taking place April 27-29, 2016 in Los Angeles, CA. We wish them luck!

- Arn Andrews, CIO, City of San Jose Department of Retirement Services
- Ryan Parham, CIO, Arizona Public Safety Personnel Retirement Systems
- Girard Miller, CIO, Orange County Employees Retirement System



NEPC Client Recognitions (continued)

A number of NEPC clients were named on TrustedInsight's list of Top 30 Pension Fund Chief Investment Officers. According to the January 2016 issue, "these 30 chief investment officers manage more than \$1.3 trillion in assets for millions of retirees in the United States. These professionals are at the forefront of an industry that's slow to evolve, under constant scrutiny and vital to the wellbeing of many average Americans. Nonetheless, they operate at the top of their field to prudently protect the benefits of their constituency." NEPC clients that made the list include:

- Scott Evans, CIO, New York Employees Retirement System - \$78.5B AUM
- David Villa, CIO, State of Wisconsin Investment Board - \$102B AUM
- Gary Dokes, CIO, Arizona State Retirement System - \$31B AUM
- Michael Trotsky, Executive Director, CIO, Massachusetts PRIM Board - \$62B AUM
- Robert Beale, CIO, Louisiana State Employees' Retirement System - \$5.2B AUM
- Richard Shafer, CIO, Ohio Public Employees' Retirement System - \$91.5B AUM
- James Perry, CIO, Dallas Police and Fire Pension System - \$3B AUM
- William Coaker, CIO, San Francisco Employees Retirement System - \$20.3B AUM
- Bob Jacksha, CIO, New Mexico Education Retirement Fund - \$11B AUM
- Girard Miller, CIO, Orange County Employees Retirement System - \$12.1B AUM
- Sam Masoudi, CFA, CAIA, CIO, Wyoming Retirement System - \$7.8B AUM

Appendix: SAA Policy History



Strategic Asset Allocation Policy (SAAP) History

- 7/1/75 – 12/31/79 – 40% S&P 500/60% Barclays Capital Aggregate
- 1/1/80 – 12/31/83 – 50% S&P 500/50% Barclays Capital Aggregate
- 1/1/84 – 12/31/91 – 60% S&P 500/40% Barclays Capital Aggregate
- 1/1/92 – 12/31/94 – 50% S&P 500/10% MSCI EAFE/40% Barclays Capital Aggregate
- 1/1/95 – 6/30/97 – 45% S&P 500/15% MSCI EAFE/40% Barclays Capital Aggregate
- 7/1/97 – 12/31/99 – 50% S&P 500/15% MSCI EAFE/35% Barclays Capital Aggregate
- 1/1/00 – 9/30/03 – 53% S&P 500/17% MSCI EAFE/30% Barclays Capital Aggregate
- 10/1/03 – 12/31/06 – 53% S&P 500/15% MSCI EAFE/ACWI ex-U.S.¹/26% Barclays Capital Aggregate/6% NCREIF ODCE (lagged one quarter)
- 1/1/07 – 10/31/2009 – 31% S&P 500/7% S&P 400/7% S&P 600/18% MSCI ACWI ex-U.S./5% Russell 2000 (lagged one quarter)/26% Barclays Capital Aggregate/6% NCREIF ODCE (lagged one quarter)
- 11/1/2009 – 6/30/2012 – 28% S&P 500/6% S&P 400/6% S&P 600/13% MSCI EAFE/2% MSCI EAFE Small Cap/3% MSCI Emerging Markets/7% Russell 2000 (lagged one quarter)/24% Barclays Capital Aggregate/2% Barclays Capital High Yield/6% NCREIF ODCE (lagged one quarter)/3% Dow Jones/UBS Commodities Index
- 7/1/2012 – 3/31/2015 – 23% S&P 500/5% S&P 400/5% S&P 600/14% MSCI EAFE/3% MSCI EAFE Small Cap/6% MSCI Emerging Markets/7% Russell 2000 (lagged one quarter)/13% Barclays Capital Aggregate/5% Barclays Capital High Yield/4% JP Morgan GBI-EM Global Diversified/3% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/8% NCREIF ODCE (lagged one quarter)/4% Dow Jones/UBS Commodities Index
- **4/1/2015 - present – 20% S&P 500/3% S&P 400/3% S&P 600/17% MSCI EAFE/2% MSCI EAFE Small Cap/5% MSCI Emerging Markets/8% Russell 2000 (lagged one quarter)/11% Barclays Capital Aggregate/4% Barclays Capital High Yield/10% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/10% NCREIF ODCE (lagged one quarter)/2% Bloomberg Commodities Index TR/5% Multi-Asset Class Custom Index**
- ***Interim SAA Policy:** 21% S&P 500/3% S&P 400/3% S&P 600/18% MSCI EAFE/2% MSCI EAFE Small Cap/5% MSCI Emerging Markets/8% Russell 2000 (lagged one quarter)/15% Barclays Capital Aggregate/4% Barclays Capital High Yield/6% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/8% NCREIF ODCE (lagged one quarter)/2% Bloomberg Commodity Index/5% Multi-Asset Class Custom Index

Note: Interim SAA Policy includes proration of 2% Real Estate and 4% Private Debt which are unfunded. Real Estate was prorated to equity and fixed income; Private Debt was prorated to fixed income. Recently approved Strategic Asset Allocation Policy effective April 1, 2015.

¹MSCI EAFE/ACWI ex-U.S. Benchmark is the MSCI EAFE Index prior to 10/1/2005 and the MSCI ACWI ex-U.S. thereafter.

Note: All MSCI indices changed from Gross to Net dividend withholding taxes effective 1/1/2014.

ASRS Custom Asset Class Benchmark History

- **ASRS Custom Total Equity Benchmark** was 77% S&P 500, 23% MSCI EAFE through 12/31/1999; 76% S&P 500, 24% MSCI EAFE through 9/30/2003; 78% S&P 500, 22% MSCI EAFE/ACWI ex-U.S.¹ through 12/31/2006; 49% S&P 500, 11% S&P 400, 11% S&P 600, 29% MSCI ACWI ex-U.S. through 10/31/2009; 48% S&P 500, 10% S&P 400, 10% S&P 600, 23% MSCI EAFE, 4% MSCI EAFE Small Cap, 5% MSCI Emerging Markets through 6/30/2012; 41% S&P 500, 9% S&P 400, 9% S&P 600, 25% MSCI EAFE, 5% MSCI EAFE Small Cap, 11% MSCI Emerging Markets through 3/31/2015; 40% S&P 500, 6% S&P 400, 6% S&P 600, 34% MSCI EAFE, 4% MSCI EAFE Small Cap, 10% MSCI Emerging Markets thereafter.
- **ASRS Custom Domestic Equity Benchmark** was S&P 500 through 12/31/2006; 74% S&P 500, 13% S&P 400, 13% S&P 600 through 12/31/2010; 70% S&P 500, 15% S&P 400, 15% S&P 600 through 3/31/2015.; 77% S&P 500, 11.5% S&P 400, 11.5% S&P 600 thereafter.
- **ASRS Custom International Equity Benchmark** was MSCI EAFE through 9/30/2005; MSCI ACWI ex-U.S. through 12/31/2010; 72% MSCI EAFE, 11% MSCI EAFE Small Cap and 17% MSCI Emerging Markets through 6/30/2012; 61% MSCI EAFE, 13% MSCI EAFE Small Cap and 26% MSCI Emerging Markets through 3/31/2015; 71% MSCI EAFE, 8% MSCI EAFE Small Cap and 21% MSCI Emerging Markets thereafter.
- **ASRS Custom Public Markets Fixed Income Benchmark** was Barclays Capital U.S. Aggregate Index through 12/31/2010; 93% Barclays Capital U.S. Aggregate Index, 7% Barclays Capital U.S. High Yield Bond Index through 12/31/2012; 59% Barclays Capital U.S. Aggregate Index, 23% Barclays Capital U.S. High Yield Bond Index, 18% JP Morgan GBI-EM Global Diversified through 3/31/2015; 73% Barclays Capital U.S. Aggregate Index, 27% Barclays Capital U.S. High Yield Bond Index thereafter.
- **ASRS Custom Inflation-Linked Benchmark** was 100% Barclays Capital U.S. TIPS through 7/31/2010; 50% Barclays Capital U.S. TIPS, 50% Bloomberg Commodity Index through 8/31/2010; 30% Barclays Capital U.S. TIPS, 70% Bloomberg Commodity Index through 5/31/2011; 100% Bloomberg Commodity Index thereafter.
- **Multi-Asset Class Strategies Custom Benchmark** was 56% S&P 500, 16% MSCI EAFE, 28% Barclays Capital Aggregate through 9/30/2011; 50% S&P 500, 19% MSCI EAFE, 28% Barclays Capital Aggregate, and 3% Bloomberg Commodity Index through 06/30/2012; 43% S&P 500, 25% MSCI EAFE, 28% Barclays Capital Aggregate, and 4% Bloomberg Commodity Index through 3/31/2015; market value weighted average of the benchmarks for Bridgewater (91 Day T-Bill) and Windham (52% MSCI ACWI net, 30% Citi WGBI, 9% DJ US REIT, and 9% Bloomberg Commodities Index) thereafter.
- **ASRS Cash Assetization Custom Benchmark** is 33% S&P 500, 14% Russell 2000, 25% MSCI EAFE, 28% Barclays Treasury Index through 8/24/2015; 100% Barclays US Long Treasury Index through 11/13/2015; 15% S&P 500, 15% Russell 2000, 16% MSCI EAFE, 4% MSCI Emerging Markets Index, 50% Barclays US Treasury Index thereafter.

¹MSCI EAFE/ACWI ex-U.S. Benchmark is the MSCI EAFE Index prior to 10/1/2005 and the MSCI ACWI ex-U.S. thereafter.

Note: All MSCI indices changed from Gross to Net of dividend withholding taxes effective 1/1/2014.