

# Arizona State Retirement System

## Independent ASRS Investment Program Oversight for the Period Ending March 31, 2015

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# ASRS Investment Objectives/Performance

**Note: All of the data shown on the following pages is as of March 31, 2015 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	8.5%
Constant 8%	<u>8.0%</u>
Excess Return	0.5%

**Goal Met: Yes**

**Total Fund Performance**

- 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)
<b>Total Fund</b>	2.8%	<b>6.5%</b>	<b>10.4%</b>	10.2%	7.0%	9.9%
<b>Interim SAA Policy<sup>1</sup></b>	2.5%	<b>4.4%</b>	<b>9.6%</b>	9.5%	6.7%	9.7%
<b>Excess Return</b>	0.3%	<b>2.1%</b>	<b>0.8%</b>	0.7%	0.3%	0.2%

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

<sup>1</sup>Composition of SAA Policy can be found in the appendix.

Arizona State Retirement System  
**Total Fund Attribution Analysis**

<b>Total Plan</b>	<b>1 Year</b>	<b>3 Years</b>	<b>5 Years</b>
Allocation Effect <sup>1</sup>	0.89%	0.67%	0.34%
Manager Selection Effect <sup>2</sup>	1.27%	0.21%	0.38%
Residual <sup>3</sup>	-0.02%	-0.09%	-0.05%
<b>Excess Return</b>	<b>2.14%</b>	<b>0.79%</b>	<b>0.67%</b>

*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)

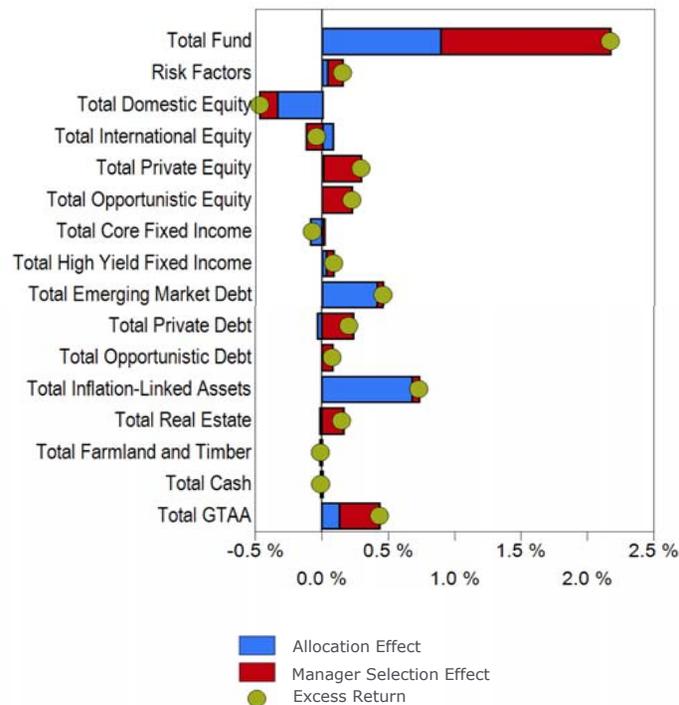
**2 Manager Selection Effect:** Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark. [Weight Asset Class Benchmark × (Return Portfolio Asset Class – Return Asset Class in Interim Policy Index)]

**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, 2015



### 1 Year Excess Return: +2.14%

- Allocation Effect: +0.89%
  - Commodities tactical underweight (+0.68%)
  - Emerging Market Debt tactical underweight (+0.41%)
  - Domestic Equity tactical underweight (-0.34%)
- Manager Selection Effect: +1.27%
  - GTAA outperformed due to Bridgewater (+0.30%)
  - Private Equity outperformed due to various managers (+0.28%)
  - Private Debt outperformed due to various managers (+0.23%)
  - Opportunistic Equity outperformed due to various managers (+0.22%)
  - Real Estate outperformed due to various managers (+0.16%)
  - Domestic Equity underperformed due to various managers (-0.13%)
  - International Equity underperformed due to various managers (-0.12%)
- 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.  $(\text{Return Asset Class Index} - \text{Total Interim Policy Index Return}) \times (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Interim Policy Index})$

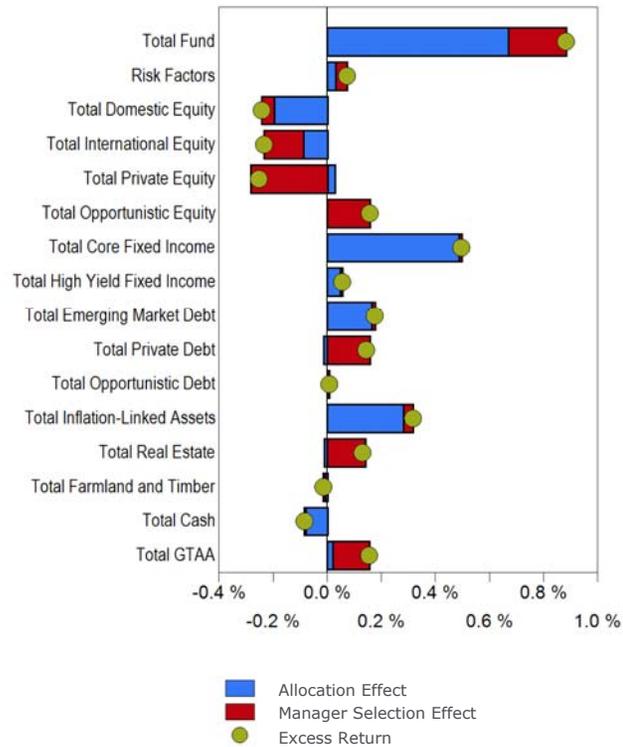
**Manager Selection Effect:** Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark.  $[\text{Weight Asset Class Benchmark} \times (\text{Return Portfolio Asset Class} - \text{Return Asset Class in Interim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

**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, 2015



### 3 Year Excess Return: +0.79%

- Allocation Effect: +0.67%
  - Public Markets Fixed Income tactical underweight (+0.71%)
  - Commodities tactical underweight (+0.28%)
  - Domestic Equity tactical underweight (-0.20%)
- Manager Selection Effect: +0.21%
  - Opportunistic Equity outperformed due to various managers (+0.16%)
  - Private Debt outperformed due to various managers (+0.16%)
  - Real Estate outperformed due to various managers (+0.14%)
  - GTAA outperformed due to Bridgewater (+0.13%)
  - Private Equity underperformed due to various managers (-0.28%)
  - International Equity underperformed due to various managers (-0.15%)
- Residual: -0.09%

*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.  $(\text{Return Asset Class Index} - \text{Total Interim Policy Index Return}) \times (\text{Weight Asset Class Portfolio} - \text{Weight Asset Class Interim Policy Index})$

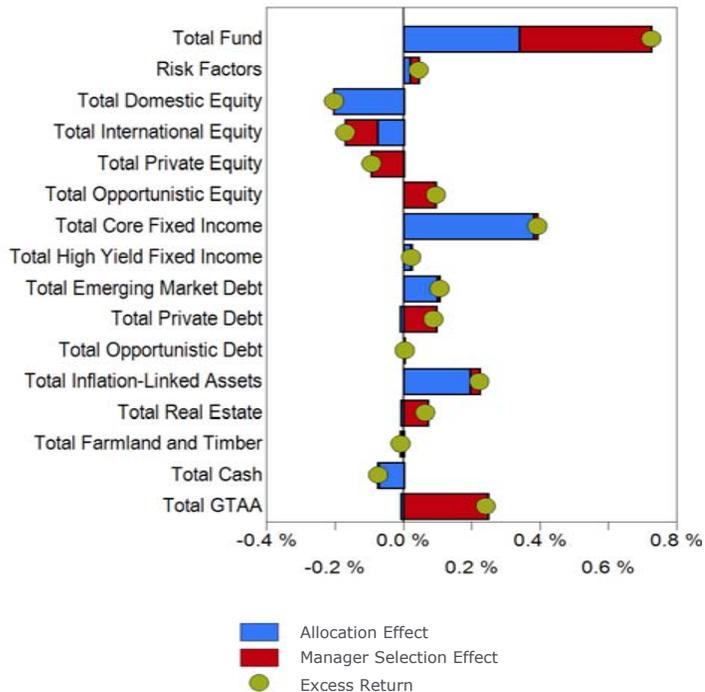
**Manager Selection Effect:** Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark.  $[\text{Weight Asset Class Benchmark} \times (\text{Return Portfolio Asset Class} - \text{Return Asset Class in Interim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

**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, 2015



### 5 Year Excess Return: +0.67%

- Allocation Effect: +0.34%
  - Public Markets Fixed Income tactical underweight (+0.50%)
  - Commodities tactical underweight (+0.20%)
  - Domestic Equity tactical underweight (-0.20%)
- Manager Selection Effect: +0.38%
  - GTAA outperformed due to Bridgewater (+0.25%)
  - Private Debt outperformed due to various managers (+0.10%)
  - Opportunistic Equity outperformed due to various managers (+0.09%)
  - Real Estate outperformed due to various managers (+0.07%)
  - International Equity underperformed due to various managers (-0.09%)
  - Private Equity underperformed due to various managers (-0.09%)
- 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.  $[\text{Weight Asset Class Benchmark} \times (\text{Return Portfolio Asset Class} - \text{Return Asset Class in Interim Policy Index})]$

**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 <sup>1</sup>	6.5%	12.6%
ASRS Custom Total Equity Benchmark	6.8%	12.8%
Excess Return	<b>-0.3%</b>	<b>-0.2%</b>
ASRS Domestic Equity	11.7%	16.3%
ASRS Custom Domestic Equity Benchmark	12.1%	16.5%
Excess Return	<b>-0.4%</b>	<b>-0.2%</b>
ASRS International Equity	<b>-1.3%</b>	6.6%
ASRS Custom Int'l Equity Benchmark	<b>-0.8%</b>	7.3%
Excess Return	<b>-0.5%</b>	<b>-0.7%</b>
ASRS Public Markets Fixed Income	3.5%	2.9%
ASRS Custom Fixed Income Benchmark	1.7%	2.3%
Excess Return	1.8%	0.6%
ASRS Inflation-Linked	<b>-25.7%</b>	<b>-10.7%</b>
ASRS Custom Inflation-Linked Benchmark	<b>-27.0%</b>	<b>-11.5%</b>
Excess Return	1.3%	0.8%
ASRS GTAA	8.7%	11.1%
ASRS Custom GTAA Benchmark	5.5%	9.8%
Excess Return	3.2%	1.3%

<sup>1</sup>Performance 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 Markets<sup>1</sup>

- 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	10.9%	14.3%	12.4%	Oct-07
Russell 2000	4.9%	19.2%	14.0%	
Excess Return	6.0%	-4.9%	-1.6%	
ASRS Opportunistic Equity <sup>2</sup>	28.5%	33.6%	35.2%	Apr-11
ASRS Private Debt	10.8%	--	13.1%	Jul-12
S&P/LSTA Levered Loan Index + 250 bps	4.1%	--	5.5%	
Excess Return	6.7%	--	7.6%	
ASRS Opportunistic Debt <sup>2</sup>	7.6%	10.4%	11.5%	Jan-08
ASRS Real Estate	14.3%	13.9%	6.9%	Oct-05
NFI - ODCE Index	11.5%	11.4%	6.0%	
Excess Return	2.8%	2.5%	0.9%	
ASRS Farmland and Timber	3.4%	--	4.1%	Jul-13
CPI ex-Food and Energy + 350 bps	5.2%	--	5.0%	
Excess Return	-1.8%	--	-0.9%	
ASRS Total Infrastructure			0.2%	Oct-14
CPI - Infrastructure + 350bps			1.2%	
Excess Return			-1.0%	

<sup>1</sup>Performance of private markets portfolios and corresponding benchmarks is reported on a one quarter lag. Performance shown as of June 30, 2014.

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

Note: Time-weighted performance of private markets portfolios shown for the one- and three-year periods to reconcile Total Fund performance as it is reported on a time-weighted basis. 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 +	Internal CFs =	Total CFs during the Month	Last day of the Month Ending Balance*
Apr-14	(\$91.6)	(\$50.8)	(\$142.4)	\$455.5
May-14	(\$15.2)	(\$76.4)	(\$91.6)	\$162.8
Jun-14	(\$89.3)	(\$284.2)	(\$373.5)	\$146.8
Jul-14	(\$153.7)	(\$59.0)	(\$212.7)	\$249.6
Aug-14	(\$117.4)	(\$133.1)	(\$250.5)	\$141.8
Sep-14	(\$84.7)	(\$6.8)	(\$91.5)	\$365.4
Oct-14	(\$64.8)	\$57.7	(\$7.1)	\$139.9
Nov-14	(\$109.5)	(\$72.2)	(\$181.7)	\$314.7
Dec-14	(\$56.7)	(\$571.9)	(\$628.6)	\$467.3
Jan-15	(\$82.9)	(\$39.8)	(\$122.7)	\$140.1
Feb-15	(\$123.2)	\$7.2	(\$116.0)	\$80.4
Mar-15	(\$64.8)	(\$19.3)	(\$84.1)	\$418.0

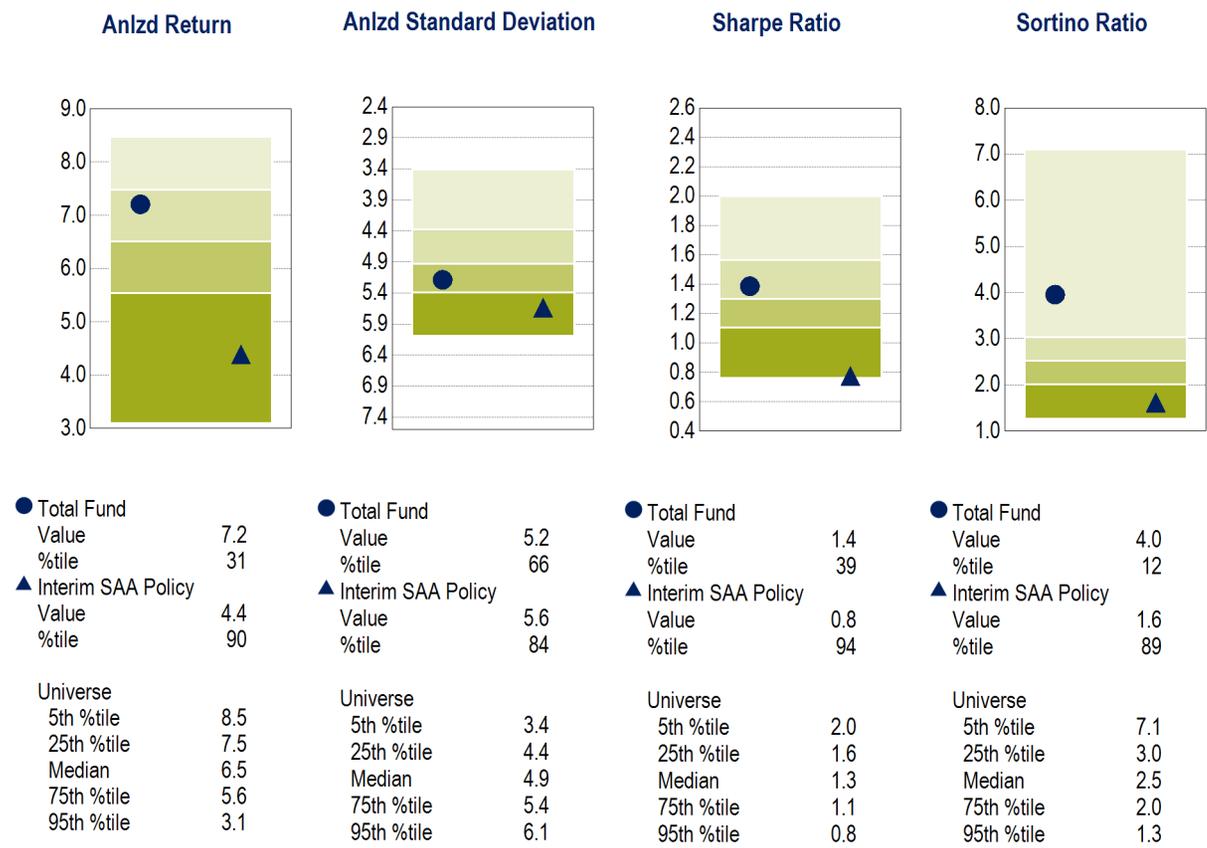
\* Aggregate assetized & unassetized cash balances. Assetized balance maintains market exposure consistent with ASRS SAAP; unassetized balance (at month end) is primarily used to fund ASRS monthly pension payments which occurs on the first day of subsequent month.

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.

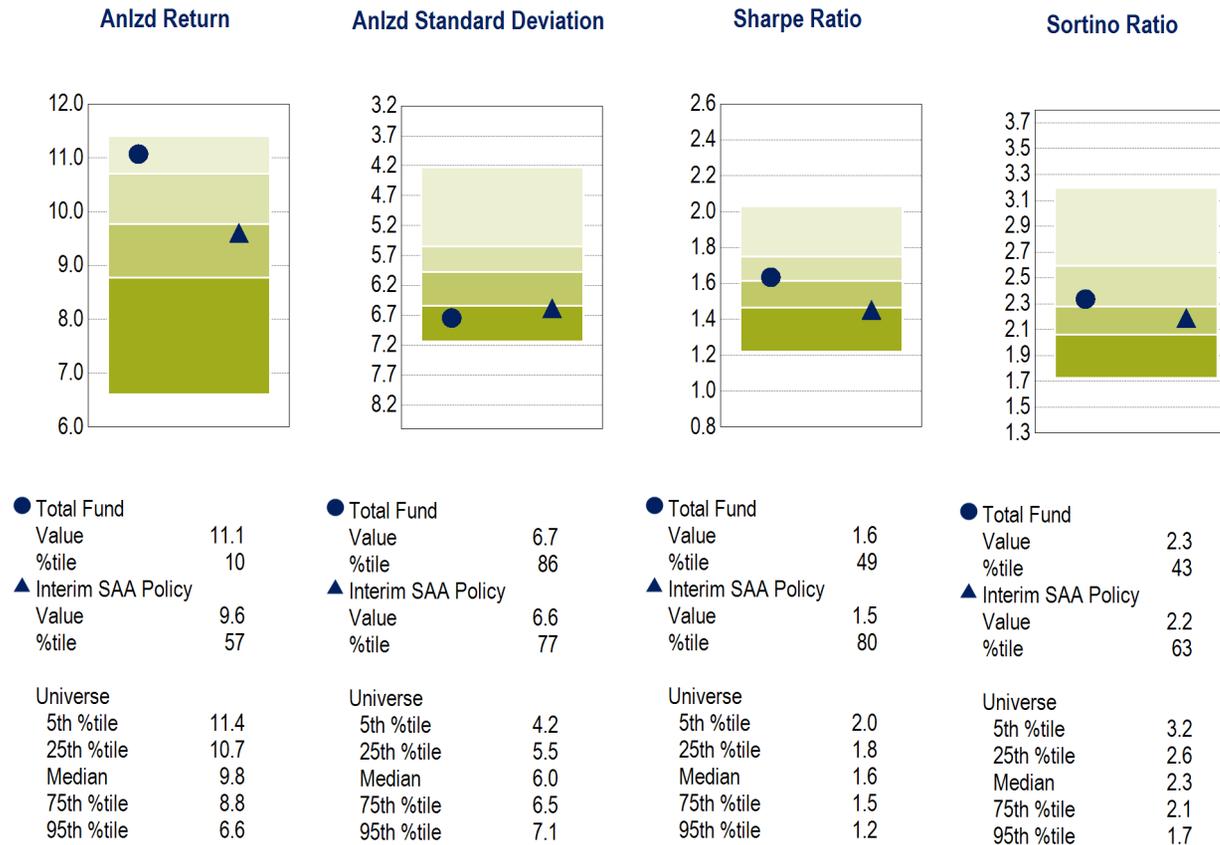
The InvestorForce Public Funds > \$1 Billion Universe contains 103 observations for the period ending March 31, 2015, with total assets of \$1,653.3 billion.

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



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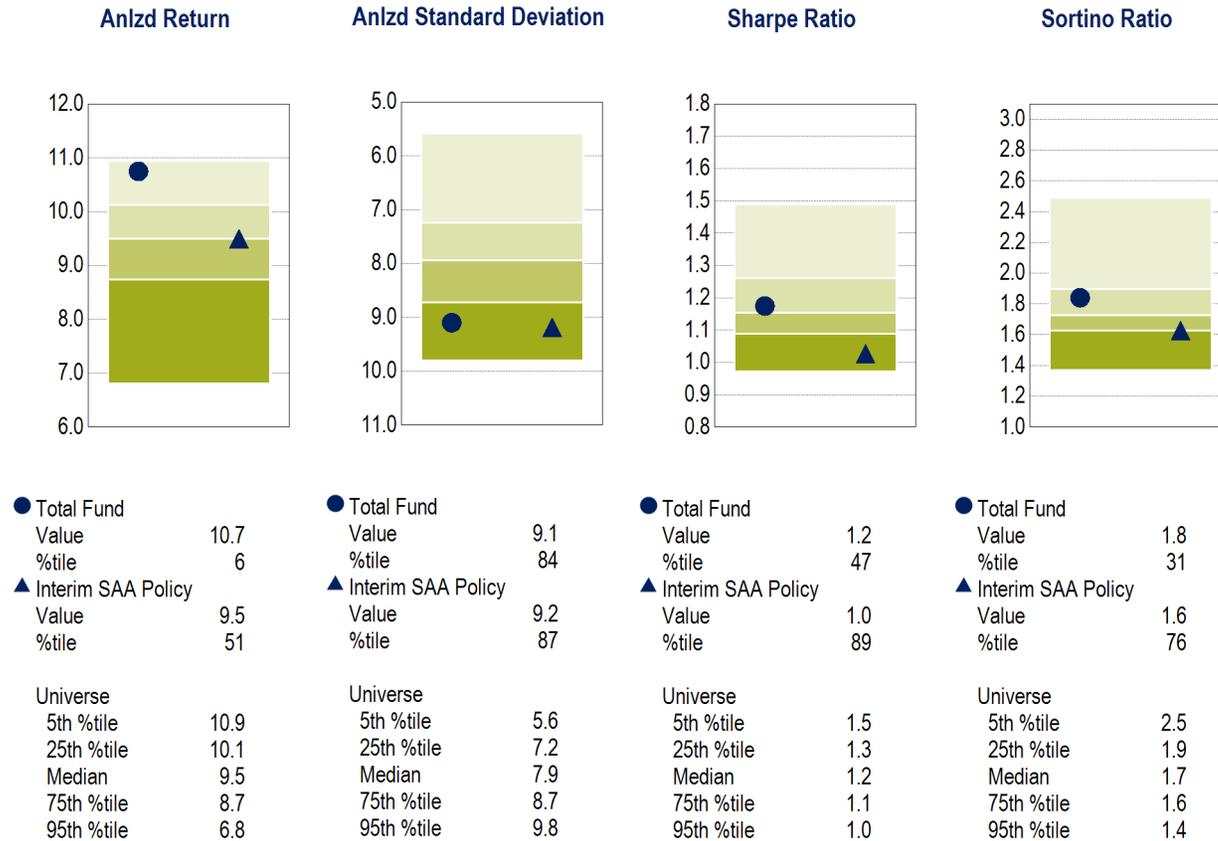
The InvestorForce Public Funds > \$1 Billion Universe contains 103 observations for the period ending March 31, 2015, with total assets of \$1,653.3 billion.

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Total Fund Risk Statistics vs. Peer Universe

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

5 Year



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

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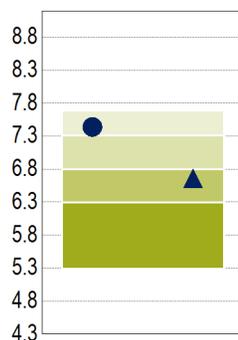
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Total Fund Risk Statistics vs. Peer Universe

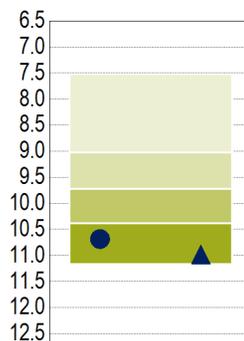
Total Fund vs. IFx Public DB > \$1B Gross(USD)(peer)

10 Year

Anlzd Return



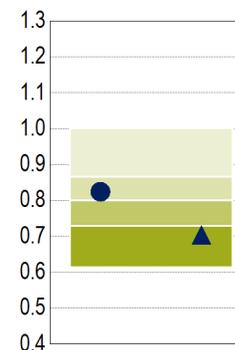
Anlzd Standard Deviation



Sharpe Ratio



Sortino Ratio



● Total Fund

Value 7.4  
%tile 16

▲ Interim SAA Policy

Value 6.7  
%tile 63

Universe

5th %tile 7.7  
25th %tile 7.3  
Median 6.8  
75th %tile 6.3  
95th %tile 5.3

● Total Fund

Value 10.7  
%tile 88

▲ Interim SAA Policy

Value 11.0  
%tile 91

Universe

5th %tile 7.5  
25th %tile 9.0  
Median 9.7  
75th %tile 10.4  
95th %tile 11.2

● Total Fund

Value 0.6  
%tile 53

▲ Interim SAA Policy

Value 0.5  
%tile 85

Universe

5th %tile 0.7  
25th %tile 0.6  
Median 0.6  
75th %tile 0.5  
95th %tile 0.4

● Total Fund

Value 0.8  
%tile 38

▲ Interim SAA Policy

Value 0.7  
%tile 84

Universe

5th %tile 1.0  
25th %tile 0.9  
Median 0.8  
75th %tile 0.7  
95th %tile 0.6

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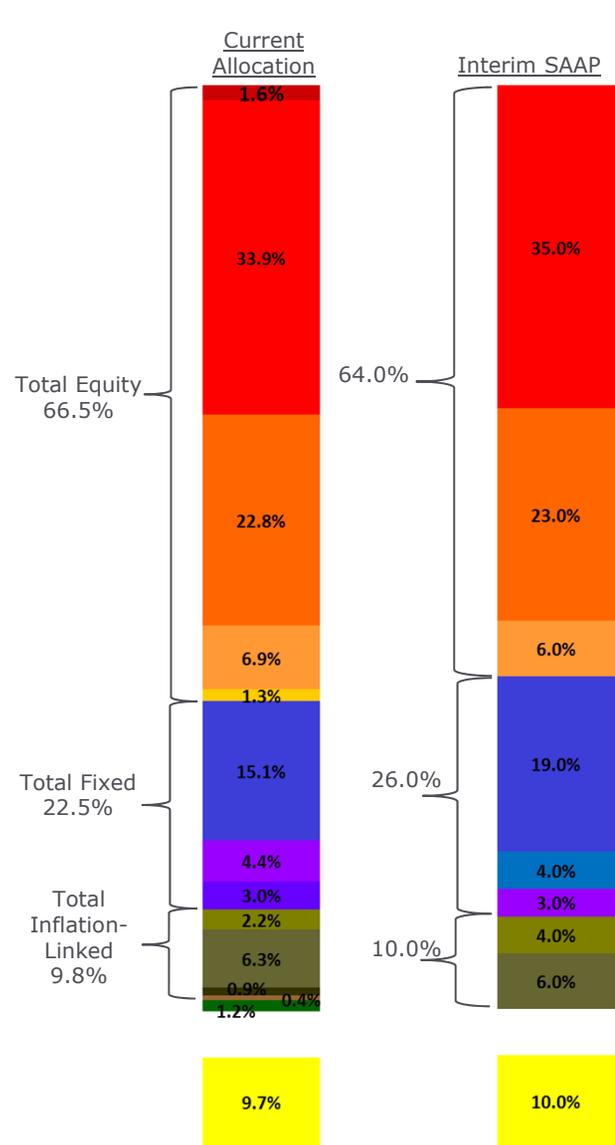
# Independent Oversight/Compliance

**Note: All of the data shown on the following pages is as of March 31, 2015 and reflects the deduction of investment manager fees, unless otherwise noted.**



# Arizona State Retirement System

## SAA Policy Compliance



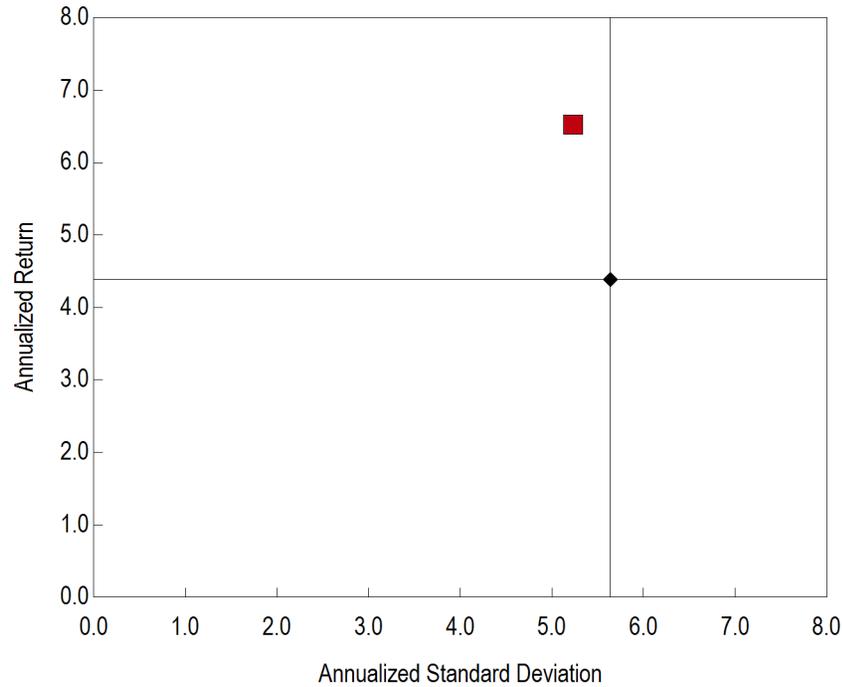
	Current Mkt Value	Current Allocation	Interim SAAP	Difference	Policy Range	Within Range
<b>Total Domestic and International Equity<sup>1</sup></b>	<b>\$20,347,927,116</b>	<b>58.4%</b>	<b>58.0%</b>	<b>0.4%</b>		
<b>Domestic Equity<sup>3</sup></b>	<b>\$11,831,906,004</b>	<b>33.9%</b>	<b>35.0%</b>	<b>-1.1%</b>	<b>26% - 38%</b>	<b>Yes</b>
U.S. Large Cap <sup>2</sup>	\$8,754,241,597	25.1%	25.0%	0.1%		
U.S. Mid Cap	\$1,652,586,192	4.7%	5.0%	-0.3%		
U.S. Small Cap	\$1,425,067,251	4.1%	5.0%	-0.9%		
<b>International Equity<sup>3</sup></b>	<b>\$7,958,927,341</b>	<b>22.8%</b>	<b>23.0%</b>	<b>-0.2%</b>	<b>16% - 28%</b>	<b>Yes</b>
Developed Large Cap <sup>2</sup>	\$4,838,107,364	13.9%	14.0%	-0.1%		
Developed Small Cap	\$1,234,365,426	3.5%	3.0%	0.5%		
Emerging Markets	\$1,886,055,413	5.4%	6.0%	-0.6%		
<b>Private Equity<sup>4</sup></b>	<b>\$2,399,015,537</b>	<b>6.9%</b>	<b>6.0%</b>	<b>0.9%</b>	<b>5% - 9%</b>	<b>Yes</b>
<b>Opportunistic Equity<sup>4,6</sup></b>	<b>\$445,055,827</b>	<b>1.3%</b>	<b>0.0%</b>	<b>1.3%</b>	<b>0% - 3%</b>	<b>Yes</b>
<b>Total Equity</b>	<b>\$23,191,998,479</b>	<b>66.5%</b>	<b>64.0%</b>	<b>2.5%</b>	<b>53% - 70%</b>	<b>Yes</b>
<b>U.S. Fixed Income</b>	<b>\$5,248,415,116</b>	<b>15.1%</b>	<b>19.0%</b>	<b>-3.9%</b>	<b>8% - 28%</b>	<b>Yes</b>
Core <sup>2</sup>	\$3,948,670,012	11.3%	14.0%	-2.7%		
High Yield	\$1,299,745,104	3.7%	5.0%	-1.3%		
<b>Emerging Market Debt</b>	<b>\$2,632,265</b>	<b>0.0%</b>	<b>4.0%</b>	<b>-4.0%</b>		
<b>Private Debt<sup>4</sup></b>	<b>\$1,533,887,137</b>	<b>4.4%</b>	<b>3.0%</b>	<b>1.4%</b>		
<b>Opportunistic Debt<sup>4,6</sup></b>	<b>\$1,059,167,206</b>	<b>3.0%</b>	<b>0.0%</b>	<b>3.0%</b>	<b>0% - 10%</b>	<b>Yes</b>
<b>Total Fixed Income</b>	<b>\$7,844,101,724</b>	<b>22.5%</b>	<b>26.0%</b>	<b>-3.5%</b>	<b>15% - 35%</b>	<b>Yes</b>
<b>Commodities<sup>2</sup></b>	<b>\$754,765,966</b>	<b>2.2%</b>	<b>4.0%</b>	<b>-1.8%</b>	<b>1% - 7%</b>	<b>Yes</b>
<b>Real Estate<sup>2,4</sup></b>	<b>\$2,195,202,777</b>	<b>6.3%</b>	<b>6.0%</b>	<b>0.3%</b>	<b>6% - 10%</b>	<b>Yes</b>
<b>Infrastructure</b>	<b>\$300,710,360</b>	<b>0.9%</b>	<b>0.0%</b>	<b>0.9%</b>	<b>0% - 3%</b>	<b>Yes</b>
<b>Farmland and Timber</b>	<b>\$153,550,845</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.4%</b>	<b>0% - 3%</b>	<b>Yes</b>
<b>Opportunistic Inflation-Linked<sup>5</sup></b>	<b>\$0</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0% - 3%</b>	<b>Yes</b>
<b>Total Inflation-Linked</b>	<b>\$3,404,229,948</b>	<b>9.8%</b>	<b>10.0%</b>	<b>-0.2%</b>	<b>8% - 16%</b>	<b>Yes</b>
<b>Cash<sup>5</sup></b>	<b>\$418,906,459</b>	<b>1.2%</b>	<b>0.0%</b>	<b>1.2%</b>		
Operating Cash (Non-Assetized)	\$101,643,079	0.3%	0.0%	0.3%		
Operating Cash (Assetized)	\$317,259,621	0.9%	0.0%	0.9%		
<b>Total</b>	<b>\$34,859,236,611</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>		

**Global Tactical Asset Allocation (GTAA)<sup>2</sup>**    \$3,387,309,107    9.7%    10.0%    -0.3%    5% - 15%    Yes

<sup>1</sup>Total Domestic and International Equity includes Equity Risk Factor Portfolio with assets of \$557.1 million.  
<sup>2</sup>GTAA allocation distributed into U.S. Large Cap Equity, Int'l Developed Large Cap Equity, Core Fixed Income, Commodities and Real Estate.  
<sup>3</sup>Domestic Equity, International Equity and U.S. Fixed Income market values include residual values remaining in terminated manager accounts. <sup>4</sup>Values shown for private markets portfolios include cash flows that occurred during 1Q 2015.  
<sup>5</sup>Non-assetized cash reflects funds required for near term external and internal cashflows.  
<sup>6</sup>Aggregate Opportunistic asset classes not to exceed 10%.  
 Note: Interim SAA Policy includes proration of 1% Private Equity 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.

Total Fund Analysis

1 Year Ending March 31, 2015

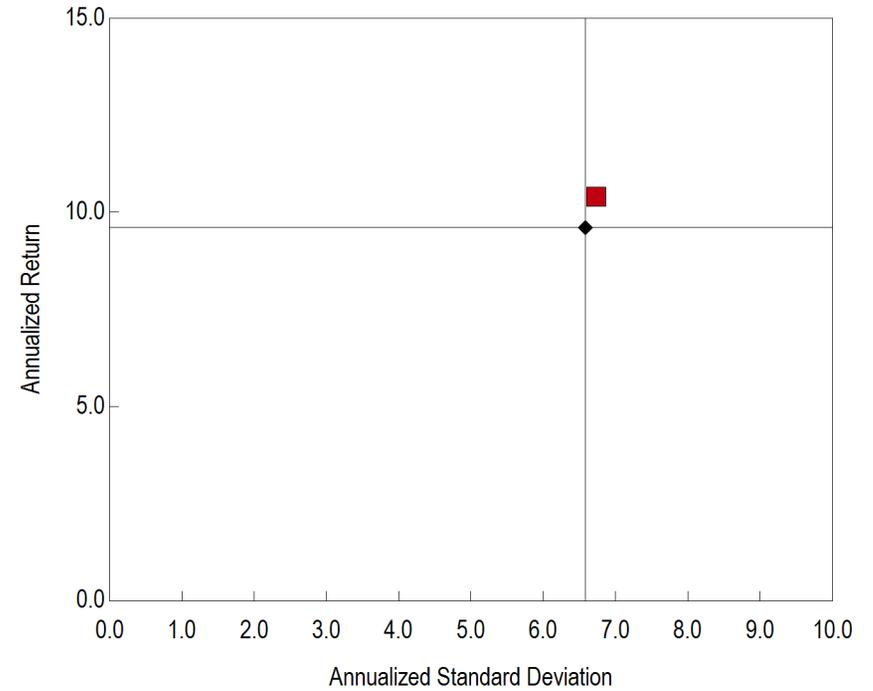


■ Total Fund  
◆ Interim SAA Policy

1 Year Ending March 31, 2015

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	6.5%	5.2%	1.2	2.7
Interim SAA Policy	4.4%	5.6%	0.8	1.6

3 Years Ending March 31, 2015



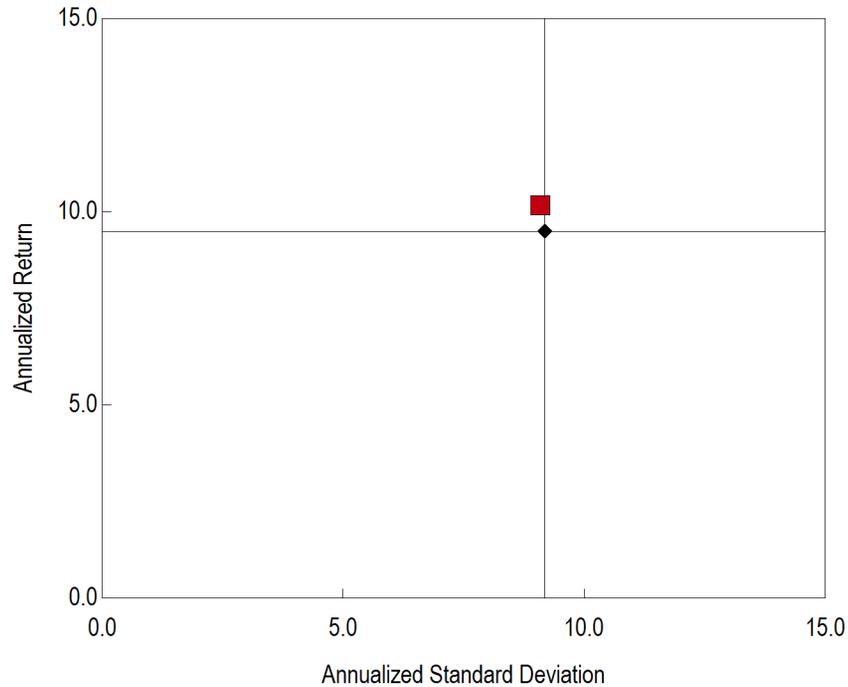
■ Total Fund  
◆ Interim SAA Policy

3 Years Ending March 31, 2015

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	10.4%	6.7%	1.5	2.2
Interim SAA Policy	9.6%	6.6%	1.5	2.2

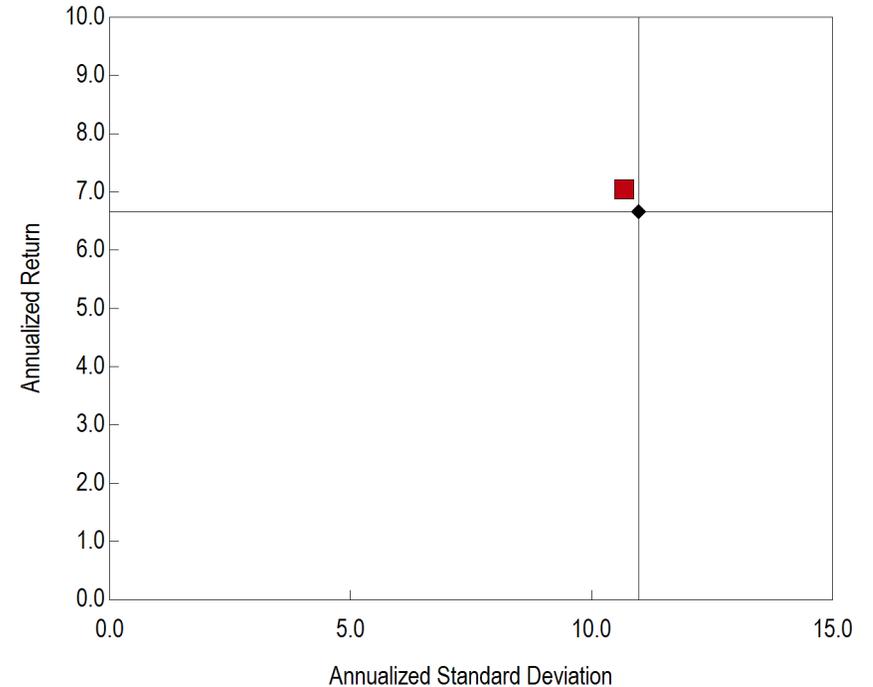
Total Fund Analysis

5 Years Ending March 31, 2015



■ Total Fund  
◆ Interim SAA Policy

10 Years Ending March 31, 2015



■ Total Fund  
◆ Interim SAA Policy

5 Years Ending March 31, 2015

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	10.2%	9.1%	1.1	1.7
Interim SAA Policy	9.5%	9.2%	1.0	1.6

10 Years Ending March 31, 2015

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	7.0%	10.7%	0.5	0.8
Interim SAA Policy	6.7%	11.0%	0.5	0.7

# 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
<b>Total Fund</b>	<b>34,859,236,611</b>	<b>100.0</b>	<b>2.8</b>	<b>--</b>	<b>2.5</b>	<b>--</b>	<b>6.5</b>	<b>--</b>	<b>10.4</b>	<b>--</b>	<b>10.2</b>	<b>--</b>	<b>7.0</b>	<b>--</b>	<b>9.9</b>	<b>Jul-75</b>
<i>Interim SAA Policy</i>			<u>2.5</u>	--	<u>0.9</u>	--	<u>4.4</u>	--	<u>9.6</u>	--	<u>9.5</u>	--	<u>6.7</u>	--	<u>9.7</u>	<i>Jul-75</i>
Over/Under			0.3		1.6		2.1		0.8		0.7		0.3		0.2	
<i>Actual Benchmark</i>			2.8	--	1.8	--	5.4	--	10.1	--	9.6	--	6.7	--	--	<i>Jul-75</i>
<b>Total Domestic and International Equity<sup>1</sup></b>	<b>18,560,058,845</b>	<b>53.2</b>	<b>2.8</b>	<b>--</b>	<b>1.9</b>	<b>--</b>	<b>6.5</b>	<b>--</b>	<b>12.6</b>	<b>--</b>	<b>11.5</b>	<b>--</b>	<b>7.3</b>	<b>--</b>	<b>6.9</b>	<b>Jan-98</b>
<i>ASRS Custom Total Equity Benchmark</i>			<u>3.0</u>	--	<u>2.1</u>	--	<u>6.8</u>	--	<u>12.8</u>	--	<u>11.6</u>	--	<u>7.4</u>	--	<u>6.2</u>	<i>Jan-98</i>
Over/Under			-0.2		-0.2		-0.3		-0.2		-0.1		-0.1		0.7	
<b>Total Domestic Equity</b>	<b>10,969,827,465</b>	<b>31.5</b>	<b>2.0</b>	<b>66</b>	<b>6.7</b>	<b>51</b>	<b>11.7</b>	<b>41</b>	<b>16.3</b>	<b>43</b>	<b>14.9</b>	<b>45</b>	<b>8.8</b>	<b>53</b>	<b>11.4</b>	<b>Jul-75</b>
<i>ASRS Custom Domestic Equity Benchmark</i>			<u>2.1</u>	65	<u>7.2</u>	45	<u>12.1</u>	37	<u>16.5</u>	40	<u>14.9</u>	44	<u>8.5</u>	59	<u>11.5</u>	<i>Jul-75</i>
Over/Under			-0.1		-0.5		-0.4		-0.2		0.0		0.3		-0.1	
<i>eA All US Equity Net Median</i>			3.2		6.7		10.4		15.8		14.6		8.9		12.7	<i>Jul-75</i>
<b>Total International Equity</b>	<b>7,033,137,610</b>	<b>20.2</b>	<b>4.1</b>	<b>51</b>	<b>-5.4</b>	<b>66</b>	<b>-1.3</b>	<b>65</b>	<b>6.6</b>	<b>76</b>	<b>5.3</b>	<b>77</b>	<b>4.8</b>	<b>88</b>	<b>6.2</b>	<b>Apr-87</b>
<i>ASRS Custom Int'l Equity Benchmark</i>			<u>4.3</u>	43	<u>-5.0</u>	62	<u>-0.8</u>	58	<u>7.3</u>	63	<u>5.7</u>	72	<u>5.9</u>	69	<u>5.9</u>	<i>Apr-87</i>
Over/Under			-0.2		-0.4		-0.5		-0.7		-0.4		-1.1		0.3	
<i>eA All ACWI ex-US Equity Net Median</i>			4.1		-3.7		-0.1		8.2		7.0		6.7		6.6	<i>Apr-87</i>
<b>Total Public Markets Fixed Income</b>	<b>3,902,526,857</b>	<b>11.2</b>	<b>1.8</b>	<b>35</b>	<b>1.0</b>	<b>68</b>	<b>3.5</b>	<b>53</b>	<b>2.9</b>	<b>60</b>	<b>4.5</b>	<b>55</b>	<b>5.1</b>	<b>43</b>	<b>8.4</b>	<b>Jul-75</b>
<i>ASRS Custom Fixed Income Benchmark</i>			<u>0.8</u>	77	<u>-0.8</u>	94	<u>1.7</u>	76	<u>2.3</u>	70	<u>4.0</u>	64	<u>4.7</u>	55	--	<i>Jul-75</i>
Over/Under			1.0		1.8		1.8		0.6		0.5		0.4		--	
<i>eA All US Fixed Inc Net Median</i>			1.5		2.1		3.6		3.5		4.7		4.9		8.2	<i>Jul-75</i>
<b>Total Inflation-Linked Assets</b>	<b>538,387,248</b>	<b>1.5</b>	<b>-5.8</b>	<b>--</b>	<b>-27.1</b>	<b>--</b>	<b>-25.7</b>	<b>--</b>	<b>-10.7</b>	<b>--</b>	<b>-4.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-4.4</b>	<b>Feb-10</b>
<i>ASRS Custom Inflation-Linked Benchmark</i>			<u>-5.9</u>	--	<u>-27.1</u>	--	<u>-27.0</u>	--	<u>-11.5</u>	--	<u>-5.9</u>	--	<u>-0.7</u>	--	<u>-5.9</u>	<i>Feb-10</i>
Over/Under			0.1		0.0		1.3		0.8		1.6		--		1.5	
<b>Total GTAA</b>	<b>3,387,309,107</b>	<b>9.7</b>	<b>5.2</b>	<b>1</b>	<b>3.4</b>	<b>27</b>	<b>8.7</b>	<b>8</b>	<b>11.1</b>	<b>1</b>	<b>11.8</b>	<b>1</b>	<b>8.5</b>	<b>6</b>	<b>8.3</b>	<b>Jan-04</b>
<i>ASRS Custom GTAA Benchmark</i>			<u>1.9</u>	56	<u>1.6</u>	39	<u>5.5</u>	29	<u>9.8</u>	12	<u>9.4</u>	8	<u>6.4</u>	47	<u>6.5</u>	<i>Jan-04</i>
Over/Under			3.3		1.8		3.2		1.3		2.4		2.1		1.8	
<i>eA Global TAA Net Median</i>			2.1		0.9		4.3		6.1		5.9		6.2		6.2	<i>Jan-04</i>

<sup>1</sup>Performance 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.

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 (%)	IRR (%)	Since
<b>Total Fund</b>	<b>34,859,236,611</b>	<b>100.0</b>	<b>2.8</b>	<b>6.5</b>	<b>10.4</b>	<b>10.2</b>	<b>9.9</b>	<b>--</b>	<b>Jul-75</b>
<i>Interim SAA Policy</i>			<u>2.5</u>	<u>4.4</u>	<u>9.6</u>	<u>9.5</u>	<u>9.7</u>	--	<i>Jul-75</i>
Over/Under			0.3	2.1	0.8	0.7	0.2	--	
<i>Actual Benchmark</i>			2.8	5.4	10.1	9.6	--	--	<i>Jul-75</i>
<b>Total Private Equity</b>	<b>2,354,091,556</b>	<b>6.8</b>	<b>0.9</b>	<b>10.9</b>	<b>14.3</b>	<b>14.6</b>	<b>5.2</b>	<b>12.4</b>	<b>Oct-07</b>
<i>Russell 2000 1 QTR Lagged</i>			<u>9.7</u>	<u>4.9</u>	<u>19.2</u>	<u>15.6</u>	<u>6.5</u>	<u>14.0</u>	<i>Oct-07</i>
Over/Under			-8.8	6.0	-4.9	-1.0	-1.3	-1.6	
<b>Total Opportunistic Equity<sup>1</sup></b>	<b>422,631,977</b>	<b>1.2</b>	<b>12.8</b>	<b>28.5</b>	<b>33.6</b>	<b>--</b>	<b>26.0</b>	<b>35.2</b>	<b>Apr-11</b>
<b>Total Private Debt</b>	<b>1,500,947,146</b>	<b>4.3</b>	<b>2.1</b>	<b>10.8</b>	<b>--</b>	<b>--</b>	<b>14.7</b>	<b>13.1</b>	<b>Jul-12</b>
<i>S&amp;P/LSTA Leveraged Loan Index + 250 bps 1 QTR Lagged</i>			<u>0.1</u>	<u>4.1</u>	<u>=</u>	<u>=</u>	<u>7.3</u>	<u>5.5</u>	<i>Jul-12</i>
Over/Under			2.0	6.7			7.3	7.6	
<b>Total Opportunistic Debt<sup>1</sup></b>	<b>1,080,618,285</b>	<b>3.1</b>	<b>-0.8</b>	<b>7.6</b>	<b>10.4</b>	<b>--</b>	<b>8.6</b>	<b>11.5</b>	<b>Jan-08</b>
<b>Total Real Estate</b>	<b>2,156,445,546</b>	<b>6.2</b>	<b>6.3</b>	<b>14.3</b>	<b>13.9</b>	<b>14.2</b>	<b>4.6</b>	<b>6.9</b>	<b>Oct-05</b>
<i>NCREIF ODCE 1 QTR Lagged (net)</i>			<u>3.0</u>	<u>11.5</u>	<u>11.4</u>	<u>12.9</u>	<u>5.4</u>	<u>6.0</u>	<i>Oct-05</i>
Over/Under			3.3	2.8	2.5	1.3	-0.8	0.9	
<b>Total Farmland and Timber</b>	<b>155,283,916</b>	<b>0.4</b>	<b>2.6</b>	<b>3.4</b>	<b>--</b>	<b>--</b>	<b>-32.7</b>	<b>4.1</b>	<b>Jul-13</b>
<i>CPI ex-Food and Energy + 350 bps 1 QTR Lagged</i>			<u>1.2</u>	<u>5.2</u>	<u>=</u>	<u>=</u>	<u>5.2</u>	<u>5.0</u>	<i>Jul-13</i>
Over/Under			1.4	-1.8			-37.9	-0.9	
<b>Total Infrastructure</b>	<b>300,710,360</b>	<b>0.9</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.2</b>	<b>Oct-14</b>
<i>CPI - Infrastructure + 350 bps</i>								<u>1.2</u>	
Over/Under								-1.0	

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

Note: Performance is based on net of fee performance data.

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

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.

Time-weighted performance of private markets portfolios shown to reconcile Total Fund performance as it is reported on a time-weighted basis. 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 ASRS private markets portfolios.

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, 2015

	% 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%	10.4%	--	6.7%	--	1.1%	--	0.7	--	0.7%	--	1.0	1.5
Interim SAA Policy	--	9.6%	--	6.6%	--	--	--	--	--	--	--	--	1.5
Total Domestic and International Equity	53.2%	12.6%	--	10.0%	--	0.6%	--	-0.5	--	0.0%	--	1.0	1.3
ASRS Custom Total Equity Benchmark	--	12.8%	--	10.2%	--	--	--	--	--	--	--	--	1.3
Total Domestic Equity	31.5%	16.3%	43	9.8%	17	0.5%	1	-0.4	64	-0.1%	35	1.0	1.6
ASRS Custom Domestic Equity Benchmark	--	16.5%	40	9.9%	18	--	--	--	--	--	35	--	1.7
Total International Equity	20.2%	6.6%	76	12.3%	64	0.6%	1	-1.1	99	-0.5%	81	1.0	0.5
ASRS Custom Int'l Equity Benchmark	--	7.3%	63	12.6%	74	--	--	--	--	--	75	--	0.6
Total Public Markets Fixed Income	11.2%	2.9%	60	3.8%	71	0.6%	1	0.9	38	0.5%	89	1.0	0.7
ASRS Custom Public Markets Fixed Income Benchmark	--	2.3%	70	3.6%	70	--	--	--	--	--	96	--	0.6
Total Inflation-Linked Assets	1.5%	-10.7%	--	12.6%	--	2.5%	--	0.3	--	0.5%	--	1.0	-0.9
ASRS Custom Inflation-Linked Benchmark	--	-11.5%	--	12.7%	--	--	--	--	--	--	--	--	-0.9
Total GTAA	9.7%	11.1%	1	8.0%	78	2.0%	2	0.7	1	0.4%	32	1.1	1.4
ASRS Custom GTAA Benchmark	--	9.8%	12	7.1%	66	--	--	--	--	--	40	--	1.4

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, 2015

	% 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%	10.2%	--	9.1%	--	1.1%	--	0.6	--	0.8%	--	1.0	1.1
Interim SAA Policy	--	9.5%	--	9.2%	--	--	--	--	--	--	--	--	1.0
Total Domestic and International Equity	53.2%	11.5%	--	13.9%	--	0.6%	--	-0.2	--	0.0%	--	1.0	0.8
ASRS Custom Total Equity Benchmark	--	11.6%	--	14.0%	--	--	--	--	--	--	--	--	0.8
Total Domestic Equity	31.5%	14.9%	45	13.7%	30	0.6%	1	-0.1	51	-0.1%	39	1.0	1.1
ASRS Custom Domestic Equity Benchmark	--	14.9%	44	13.6%	29	--	--	--	--	--	37	--	1.1
Total International Equity	20.2%	5.3%	77	15.9%	40	0.8%	1	-0.5	96	-0.3%	77	1.0	0.3
ASRS Custom Int'l Equity Benchmark	--	5.7%	72	16.2%	48	--	--	--	--	--	73	--	0.3
Total Public Markets Fixed Income	11.2%	4.5%	55	3.4%	63	0.6%	1	0.9	26	0.5%	89	1.0	1.3
ASRS Custom Public Markets Fixed Income Benchmark	--	4.0%	64	3.3%	61	--	--	--	--	--	97	--	1.2
Total Inflation-Linked Assets	1.5%	-4.3%	--	13.6%	--	2.5%	--	0.6	--	1.3%	--	1.0	-0.3
ASRS Custom Inflation-Linked Benchmark	--	-5.9%	--	14.0%	--	--	--	--	--	--	--	--	-0.4
Total GTAA	9.7%	11.8%	1	9.8%	94	2.0%	4	1.2	1	2.3%	7	1.0	1.2
ASRS Custom GTAA Benchmark	--	9.4%	8	9.5%	85	--	--	--	--	--	67	--	1.0

Note: Performance is reported net of fees.

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

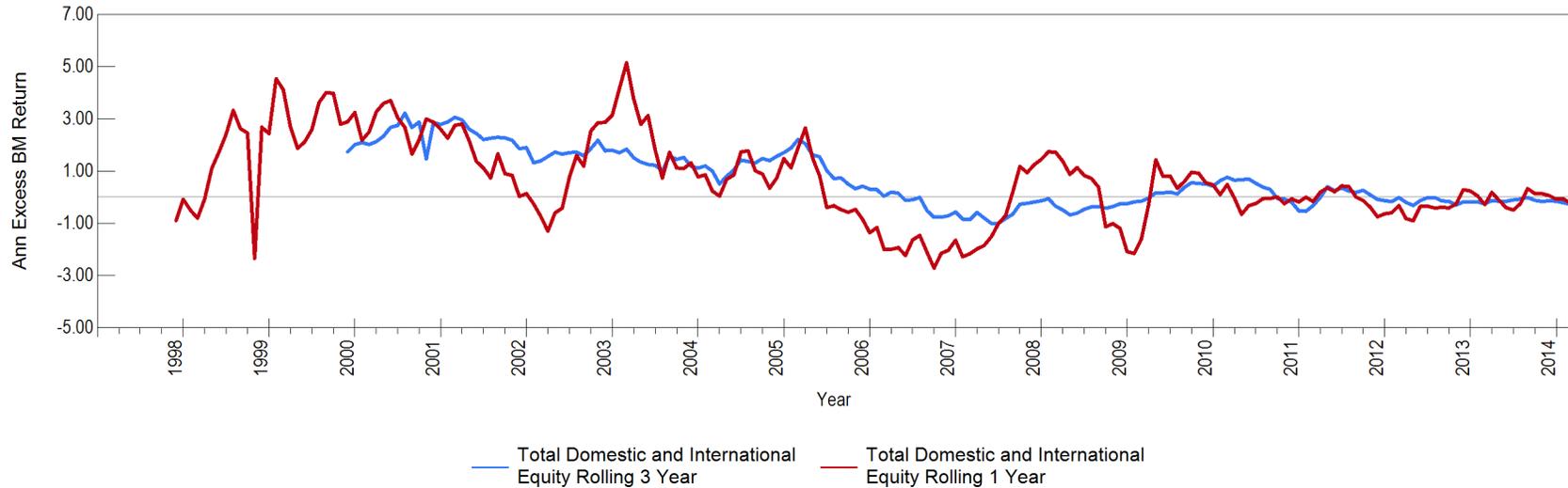
Ranks for statistics shown above are based on the respective universe against which the portfolio is ranked on the asset class performance summary that precedes this section of the analysis.

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

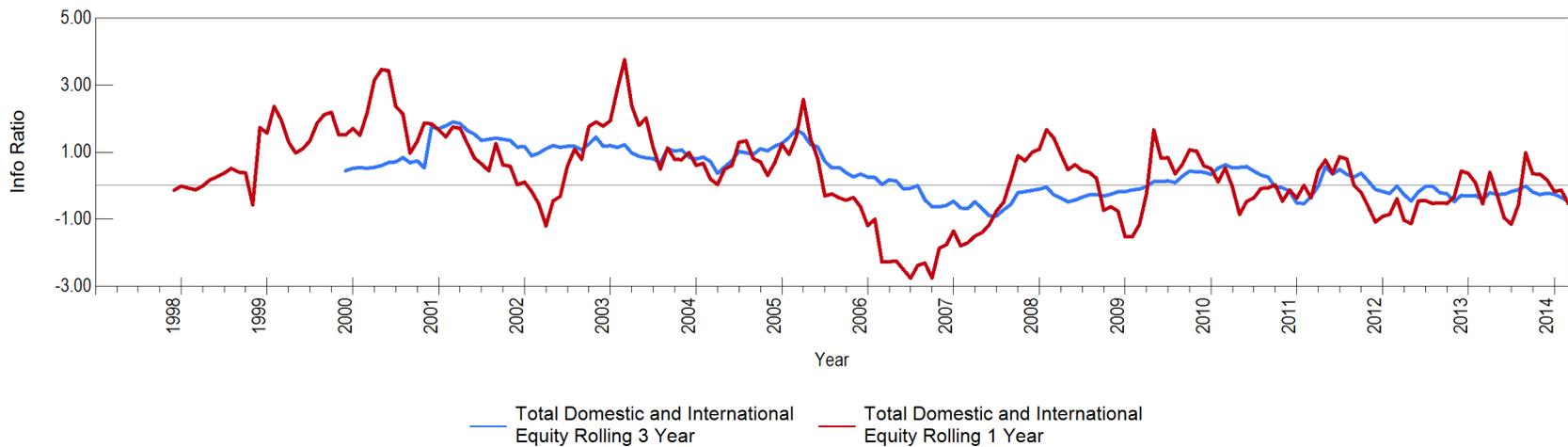
Composition of Interim SAA Policy and ASRS Custom Benchmarks can be found in the appendix.

Asset Class Analysis - Total Domestic and International Equity

Rolling Annual Excess Benchmark Return

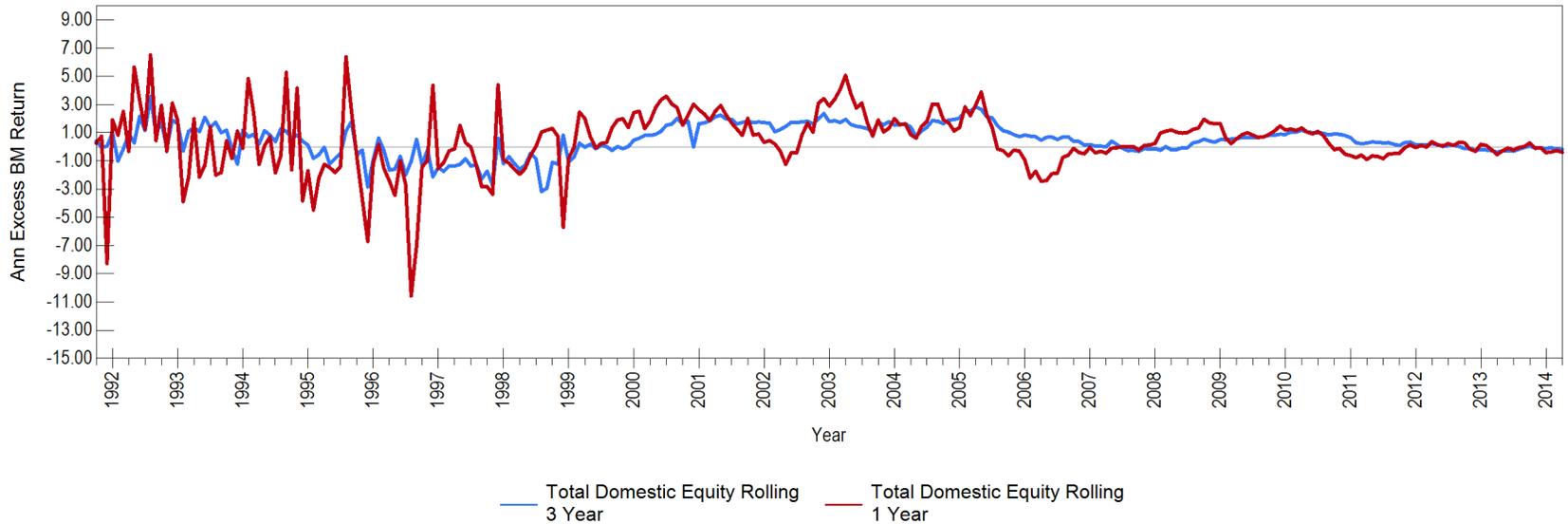


Rolling Information Ratio



Asset Class Analysis - Total Domestic Equity

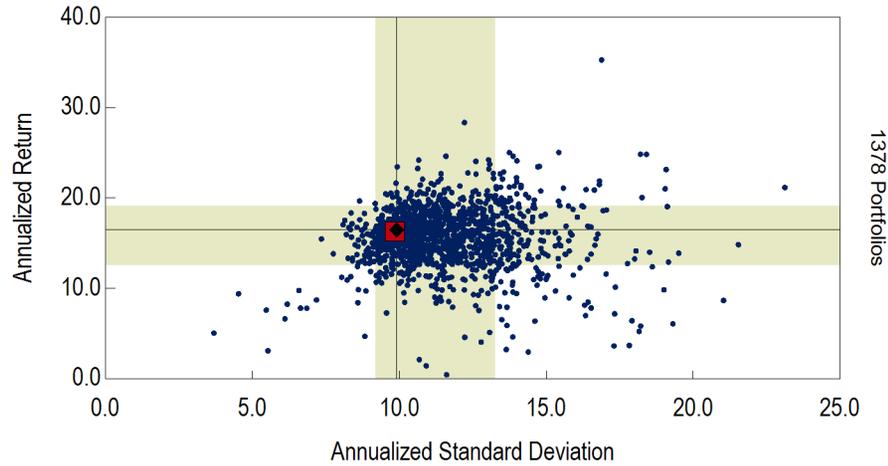
Rolling Annual Excess Benchmark Return



eA All US Equity Net Accounts

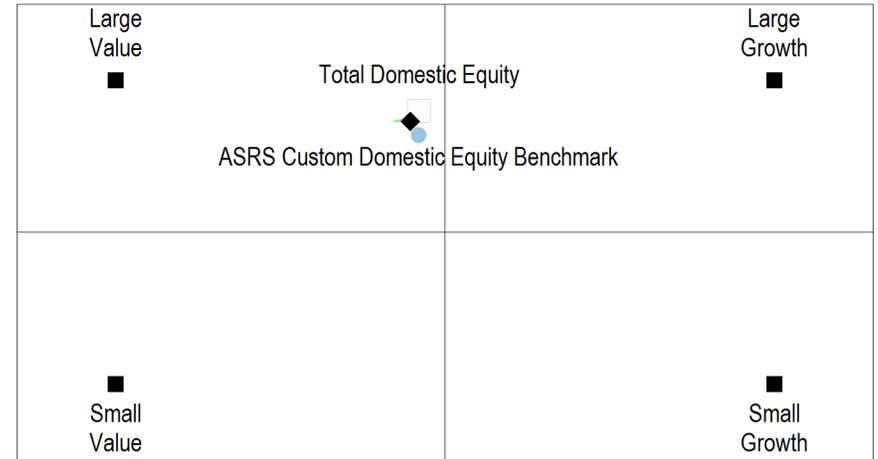


3 Year Risk Return

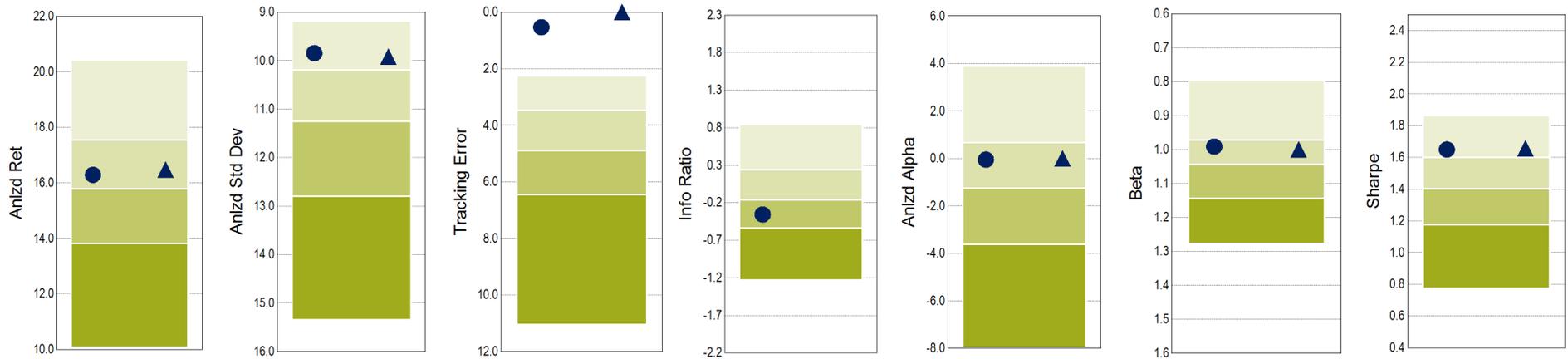


- Total Domestic Equity
- ◆ ASRS Custom Domestic Equity Benchmark
- 68% Confidence Interval
- eA All US Equity Net

3 Year Style Map



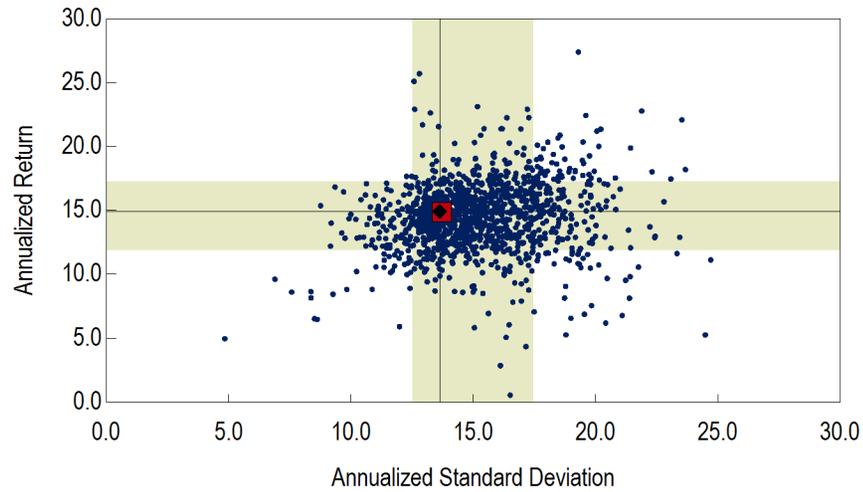
- First Rolling Period
- ◆ Last Rolling Period



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

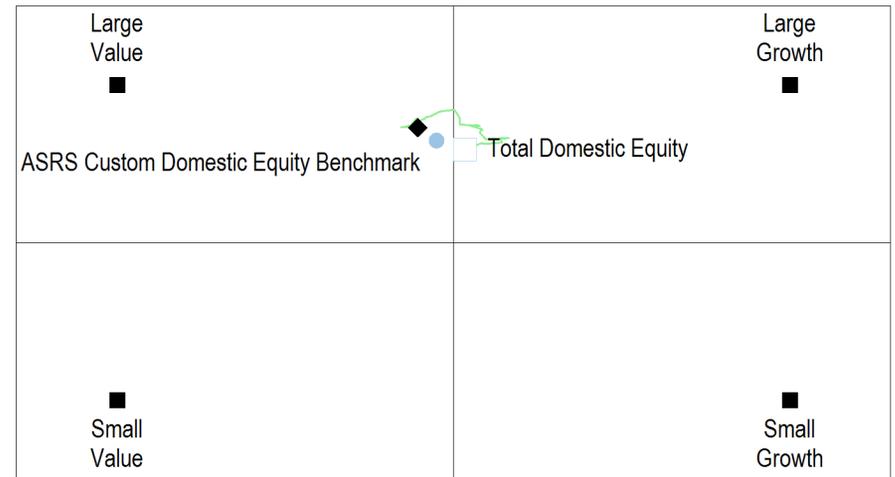
Asset Class Analysis - Total Domestic Equity

5 Year Risk Return

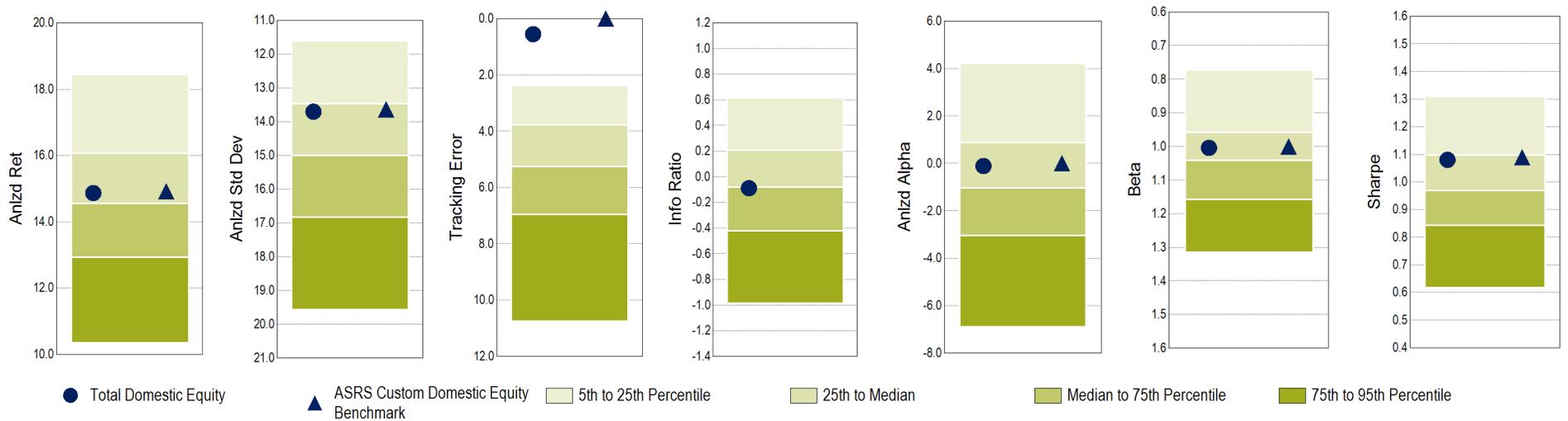


- Total Domestic Equity
- ◆ ASRS Custom Domestic Equity Benchmark
- 68% Confidence Interval
- eA All US Equity Net

5 Year Style Map



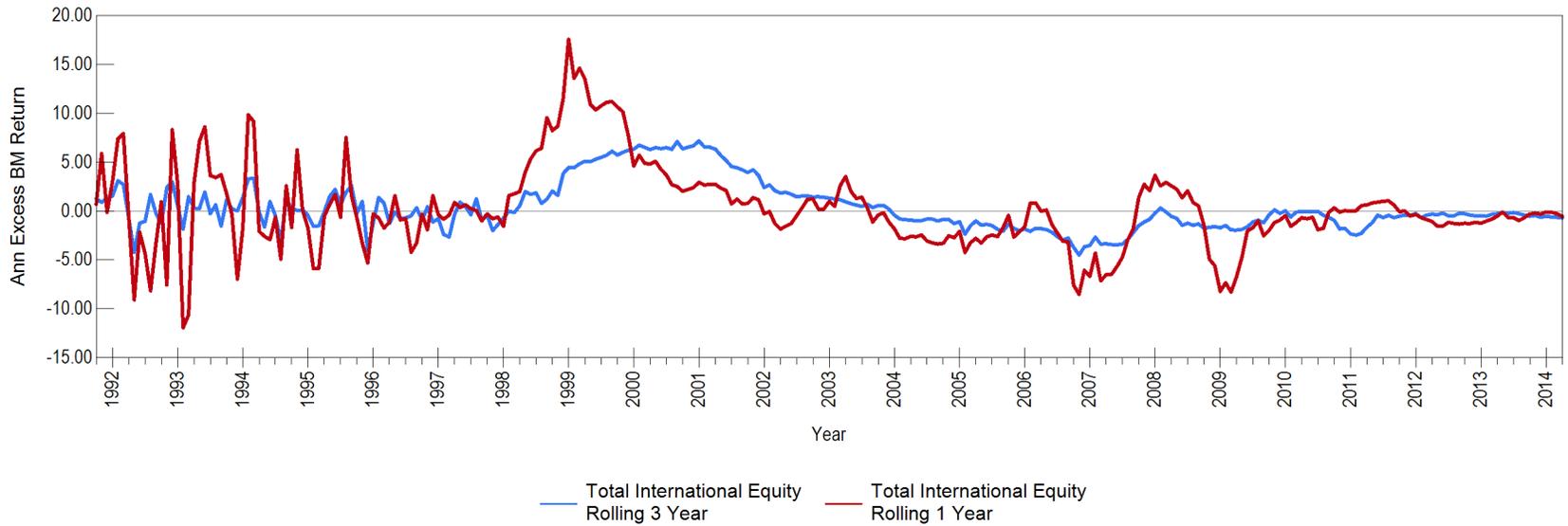
- First Rolling Period
- ◆ Last Rolling Period



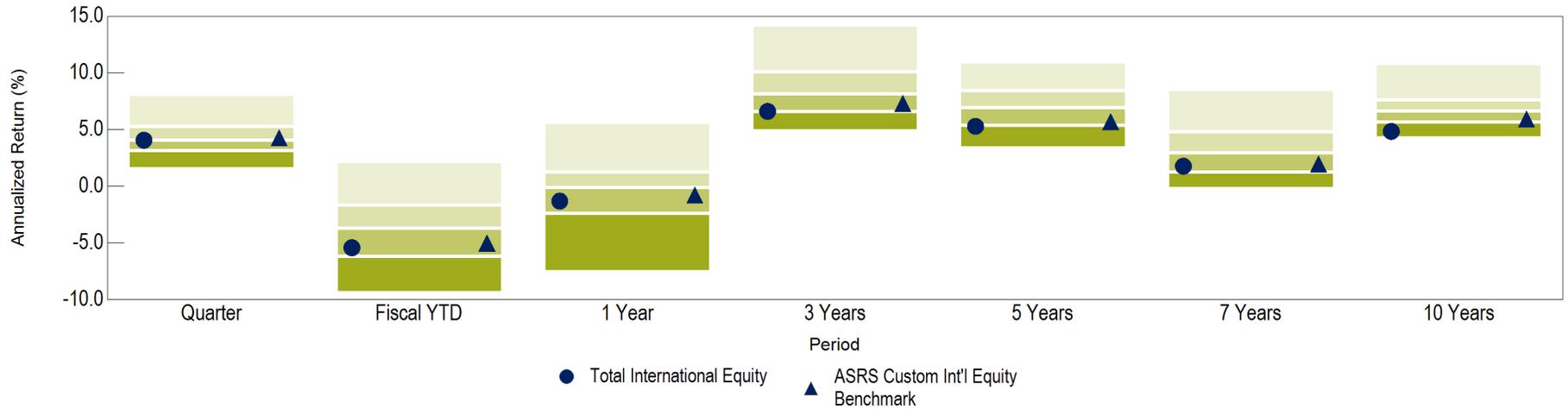
- Total Domestic Equity
- ▲ ASRS Custom Domestic Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

Asset Class Analysis - Total International Equity

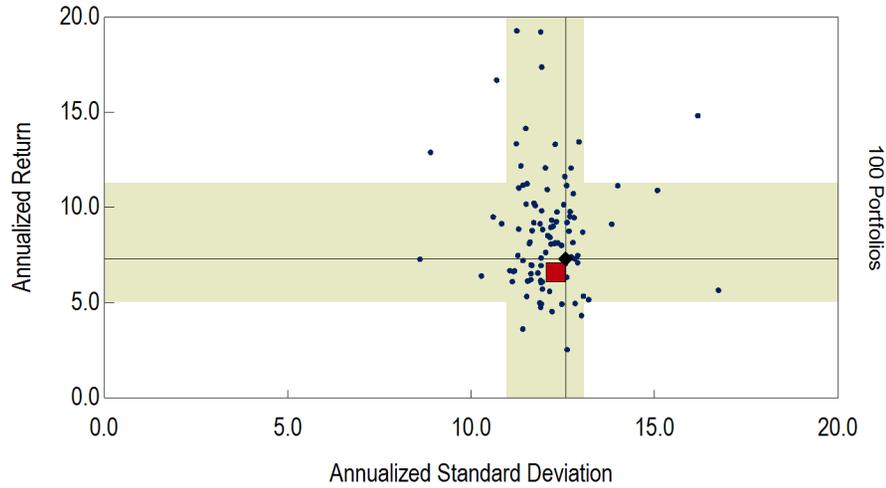
Rolling Annual Excess Benchmark Return



eA All ACWI ex-US Equity Net Accounts



3 Year Risk Return

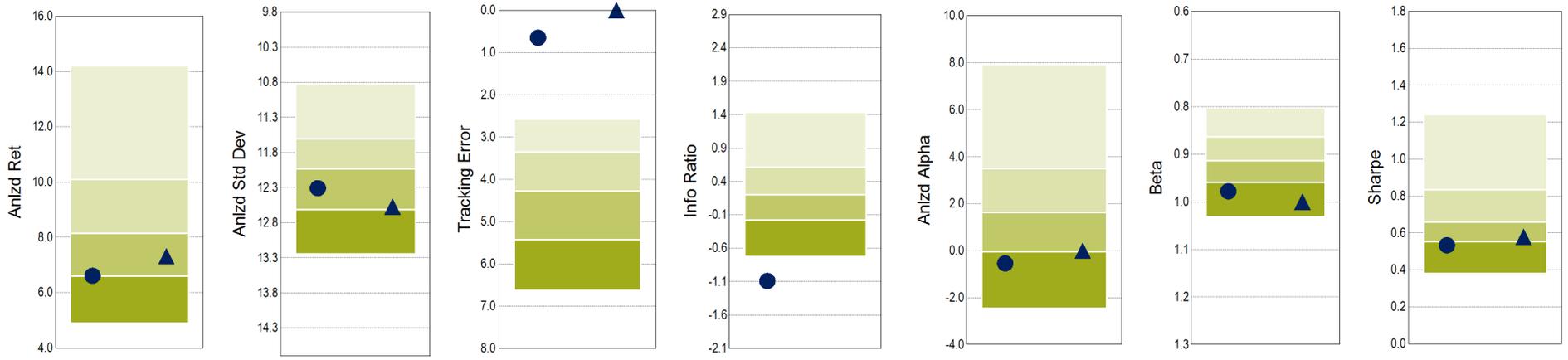


3 Year Style Map



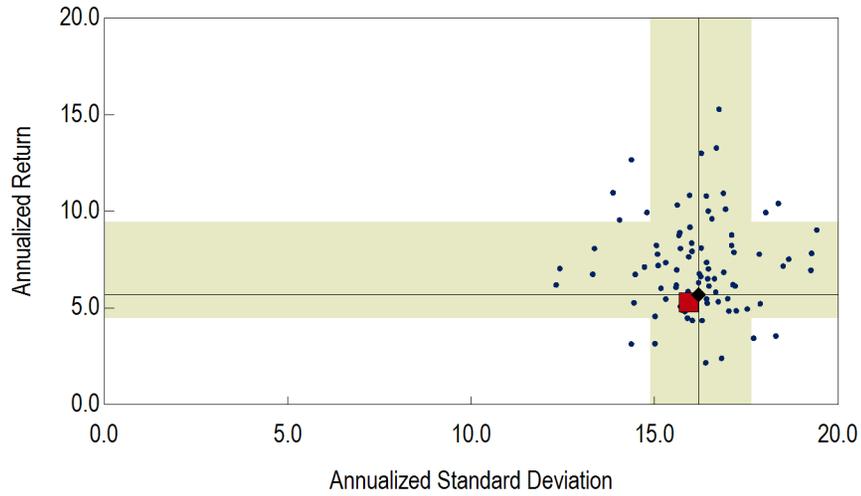
- Total International Equity
- ◆ ASRS Custom Int'l Equity Benchmark
- 68% Confidence Interval
- eA All ACWI ex-US Equity Net

- First Rolling Period
- ◆ Last Rolling Period



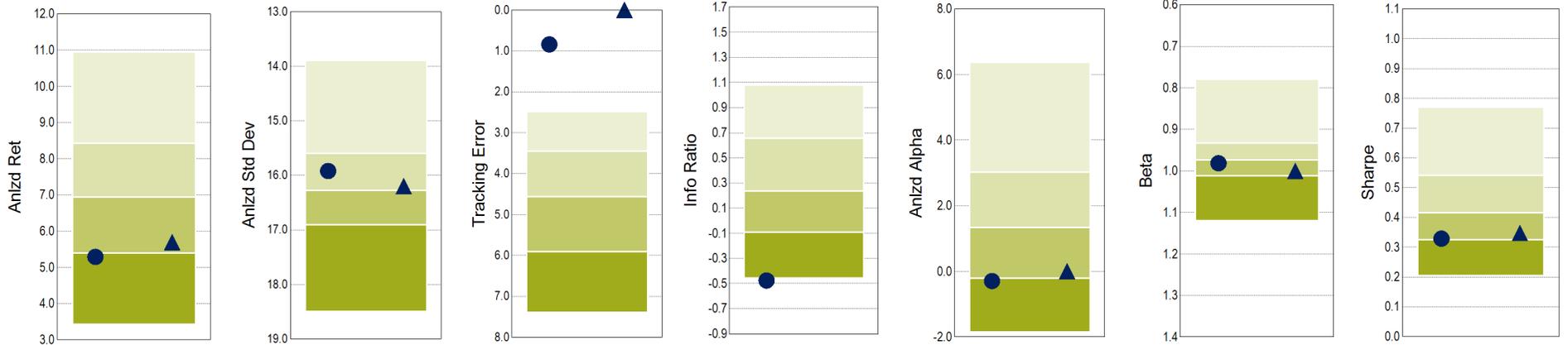
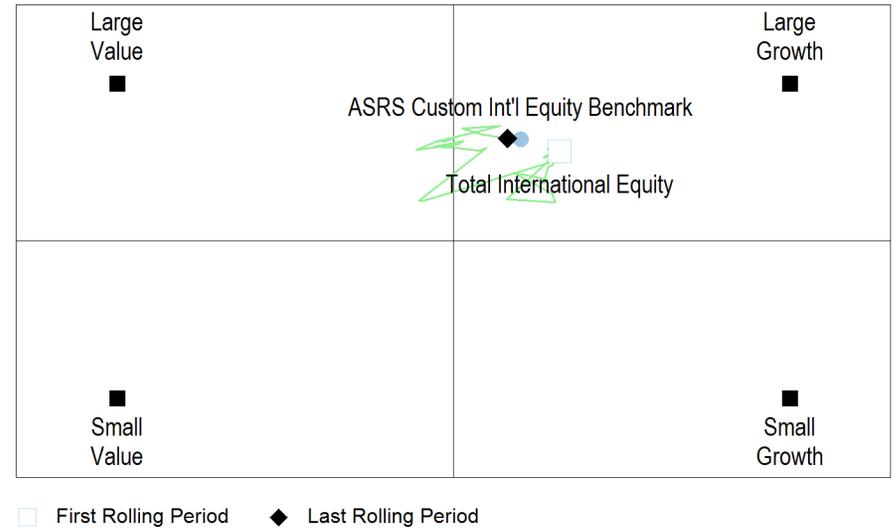
- Total International Equity
- ▲ ASRS Custom Int'l Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

5 Year Risk Return



- Total International Equity
- ◆ ASRS Custom Int'l Equity Benchmark
- 68% Confidence Interval
- eA All ACWI ex-US Equity Net

5 Year Style Map

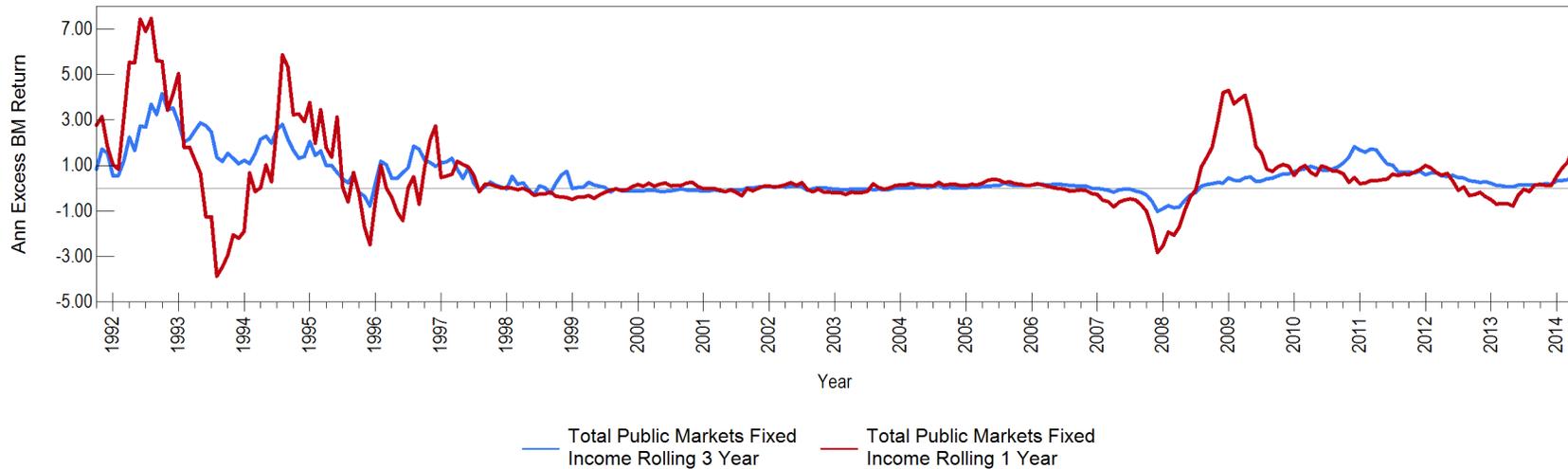


- Total International Equity
- ▲ ASRS Custom Int'l Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

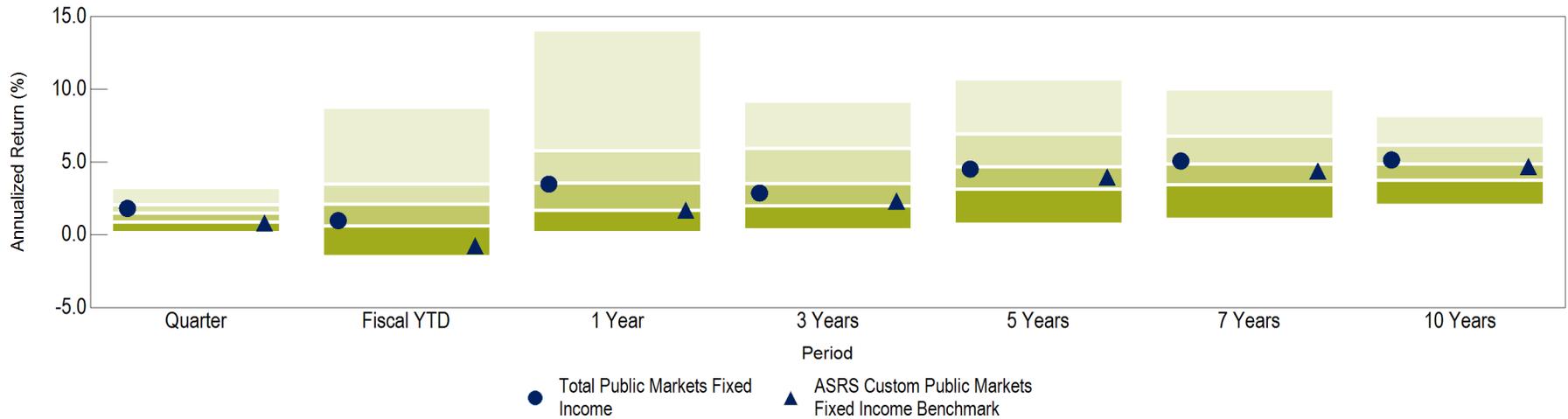


Asset Class Analysis - Total Public Markets Fixed Income

Rolling Annual Excess Benchmark Return

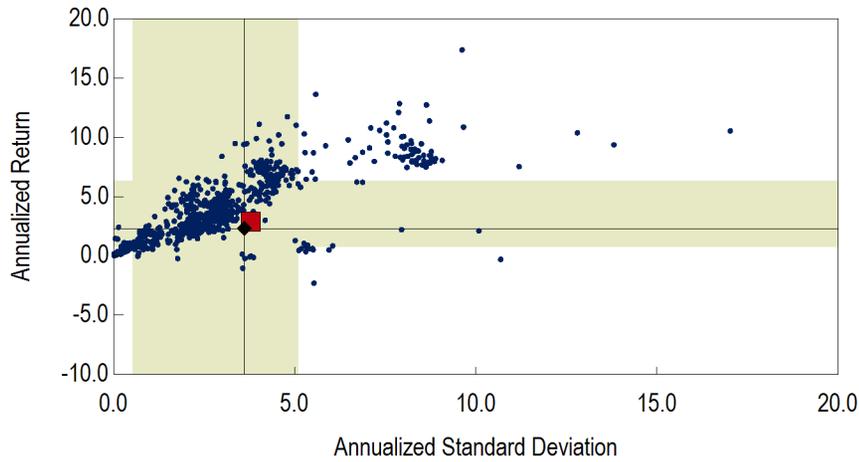


eA All US Fixed Inc Net Accounts



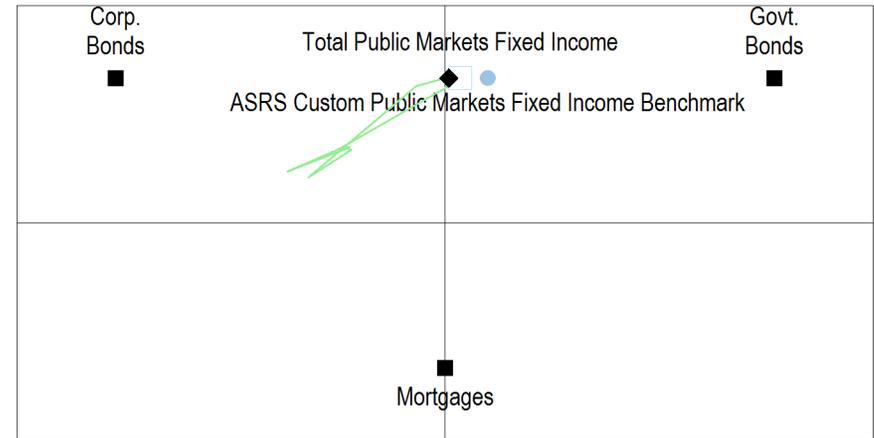
Asset Class Analysis - Total Public Markets Fixed Income

3 Years Ending March 31, 2015

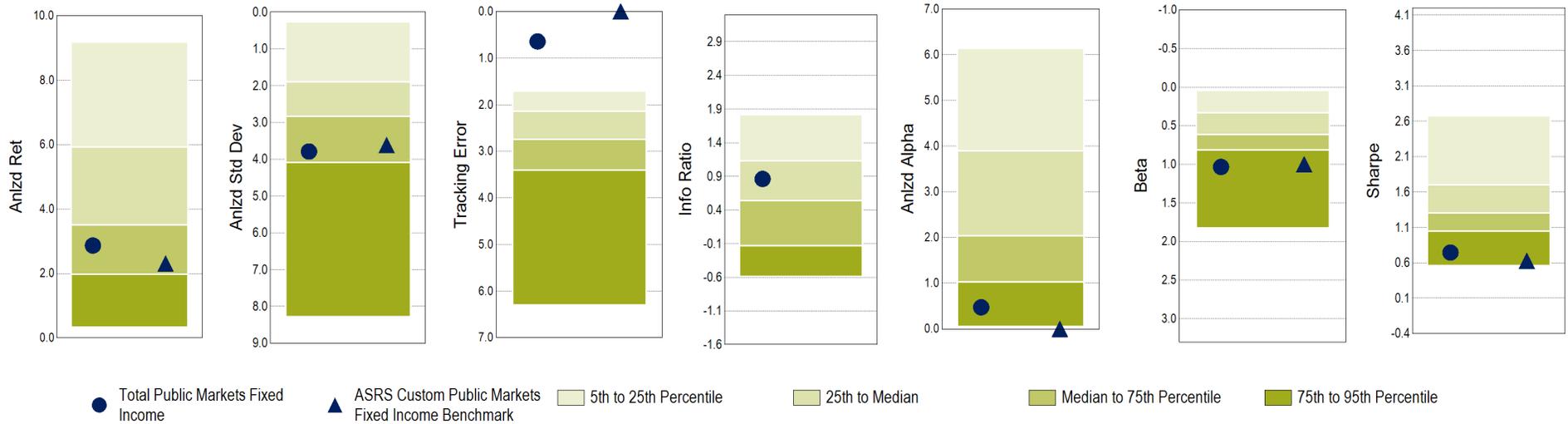


- Total Public Markets Fixed Income
- ◆ ASRS Custom Public Markets Fixed Income Benchmark
- 68% Confidence Interval
- eA All US Fixed Inc Net

3 Year Style Map



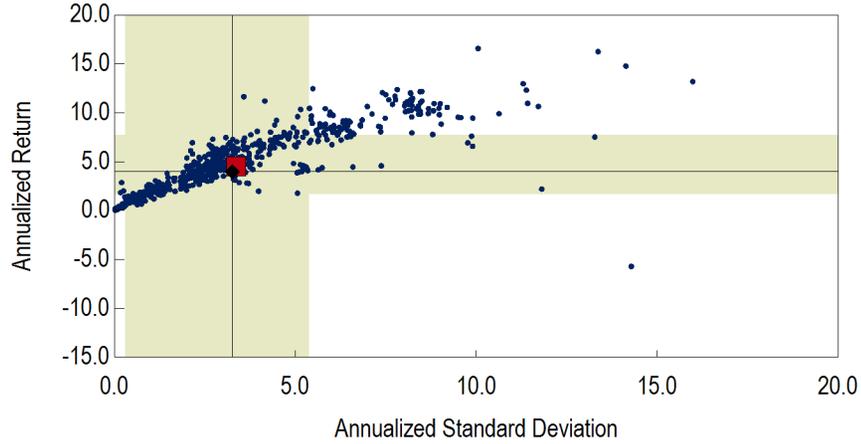
- First Rolling Period
- ◆ Last Rolling Period



- 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

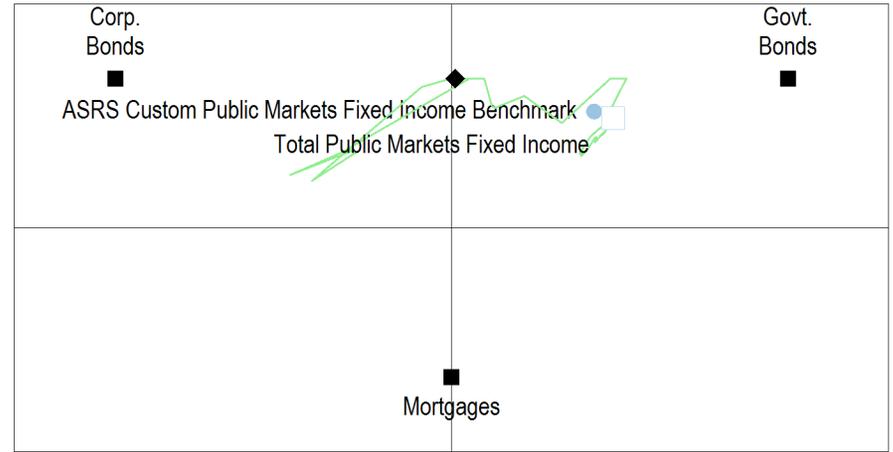
Asset Class Analysis - Total Public Markets Fixed Income

5 Years Ending March 31, 2015

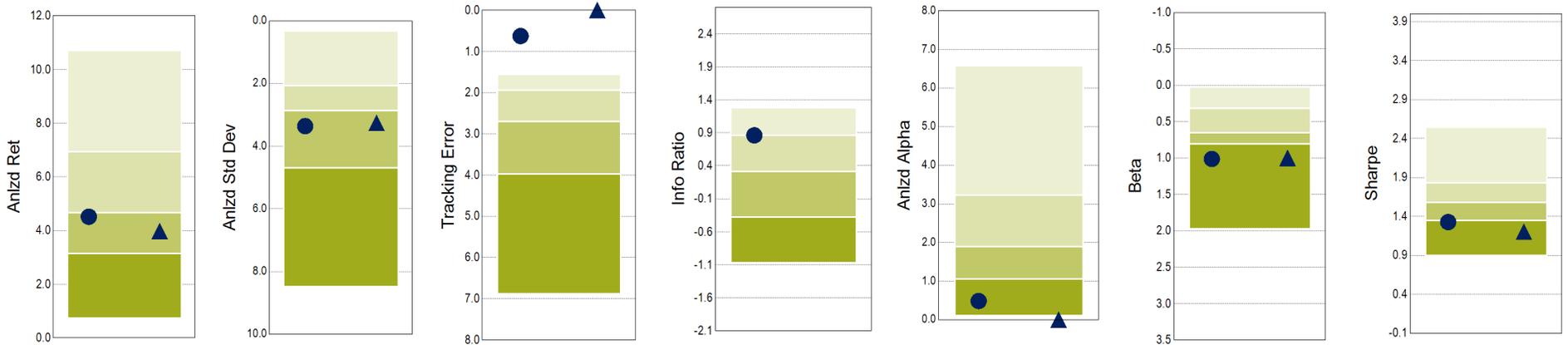


- Total Public Markets Fixed Income
- ◆ ASRS Custom Public Markets Fixed Income Benchmark
- 68% Confidence Interval
- eA All US Fixed Inc Net

5 Year Style Map



- First Rolling Period
- ◆ Last Rolling Period

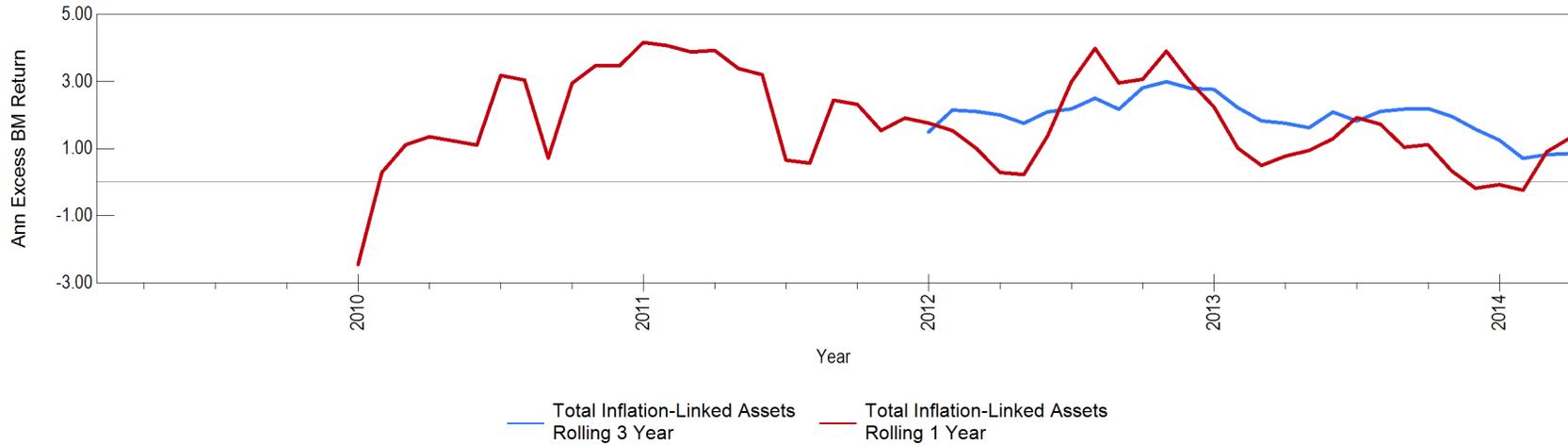


- Total Public Markets Fixed Income
- ▲ ASRS Custom Public Markets Fixed Income Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

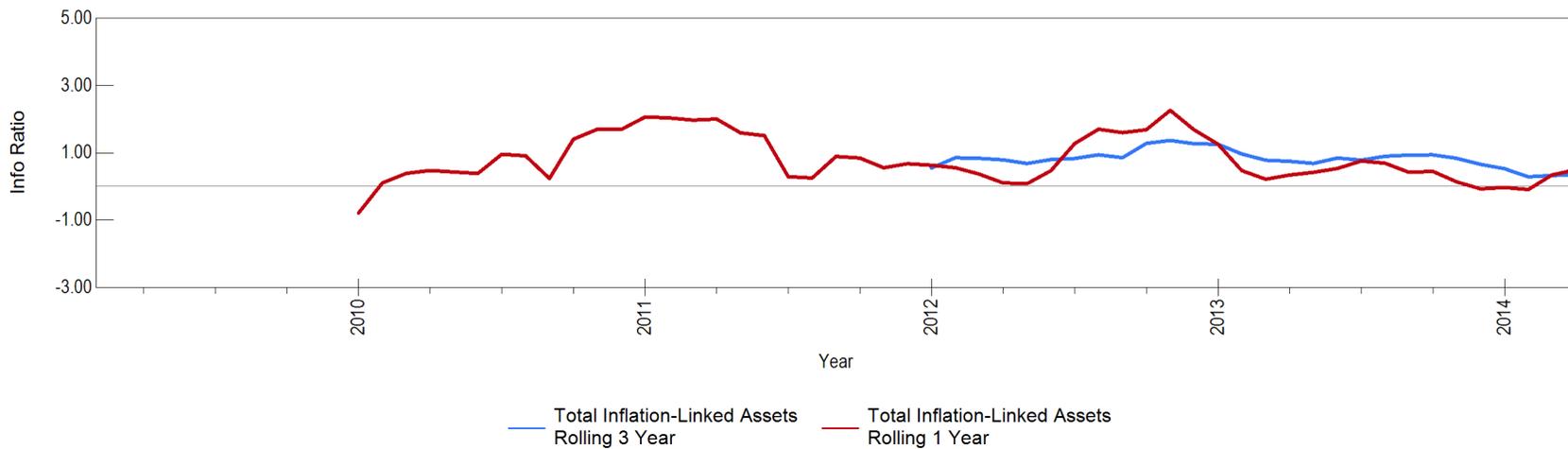


Asset Class Analysis - Total Inflation-Linked Assets

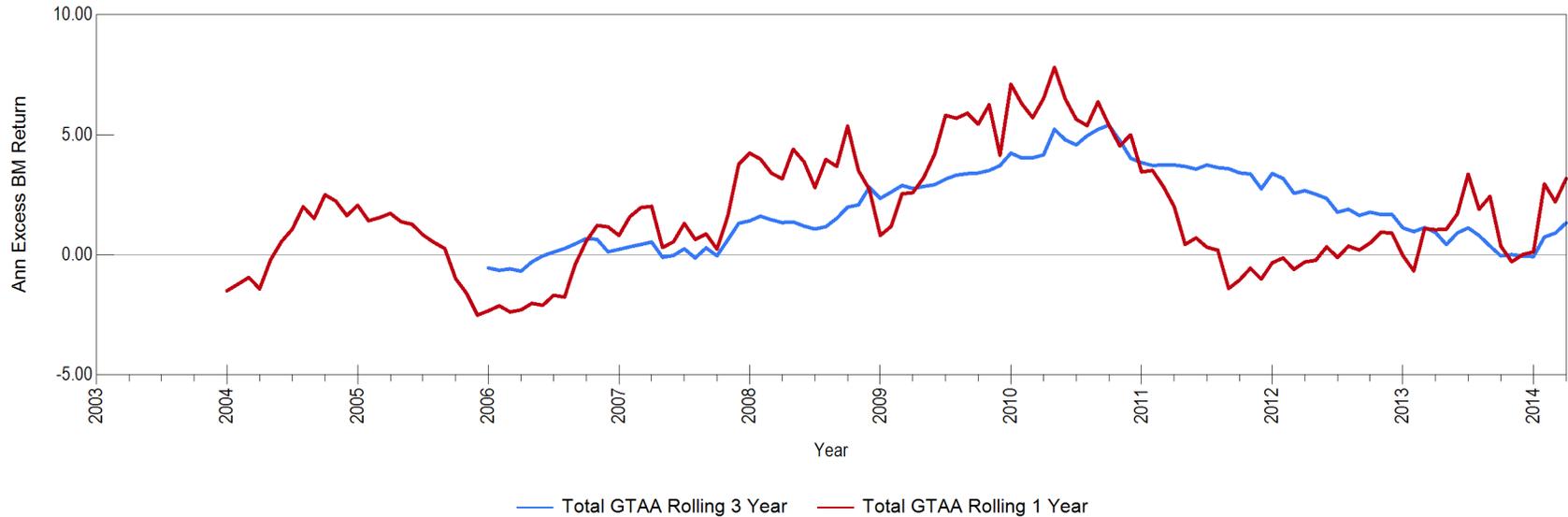
Rolling Annual Excess Benchmark Return



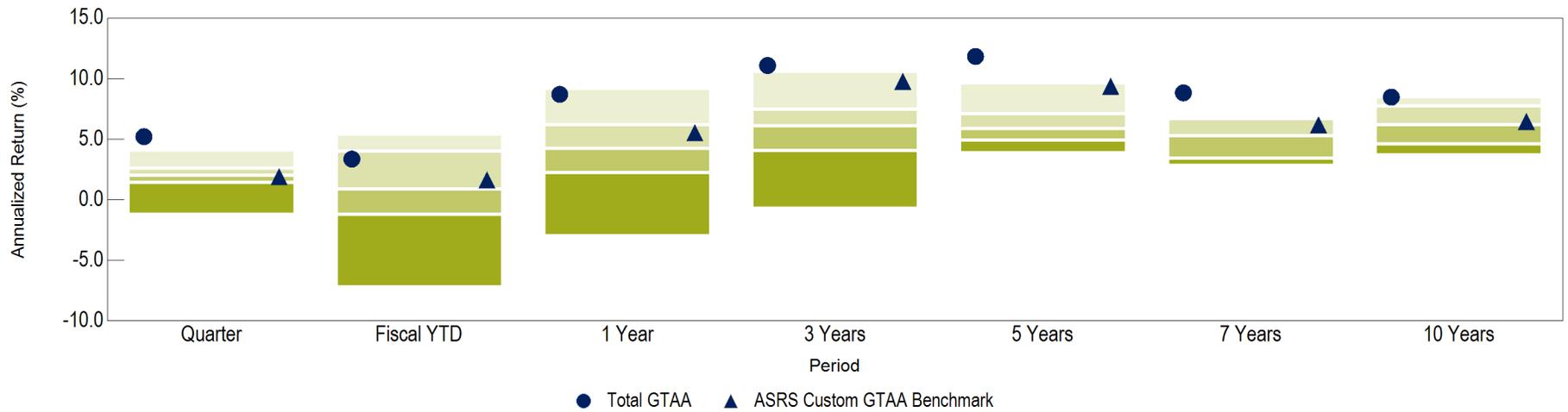
Rolling Information Ratio

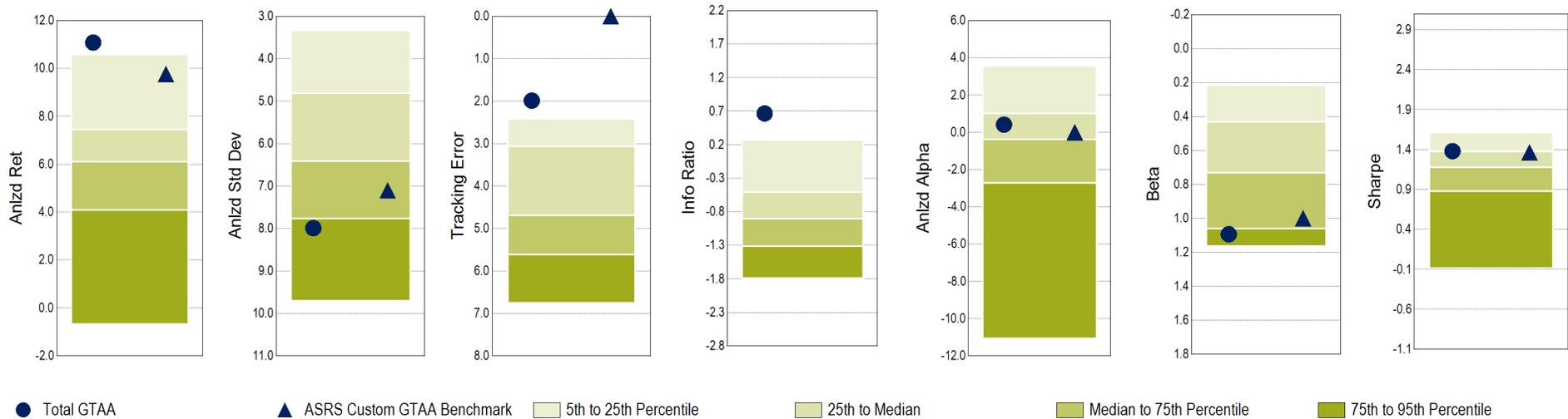
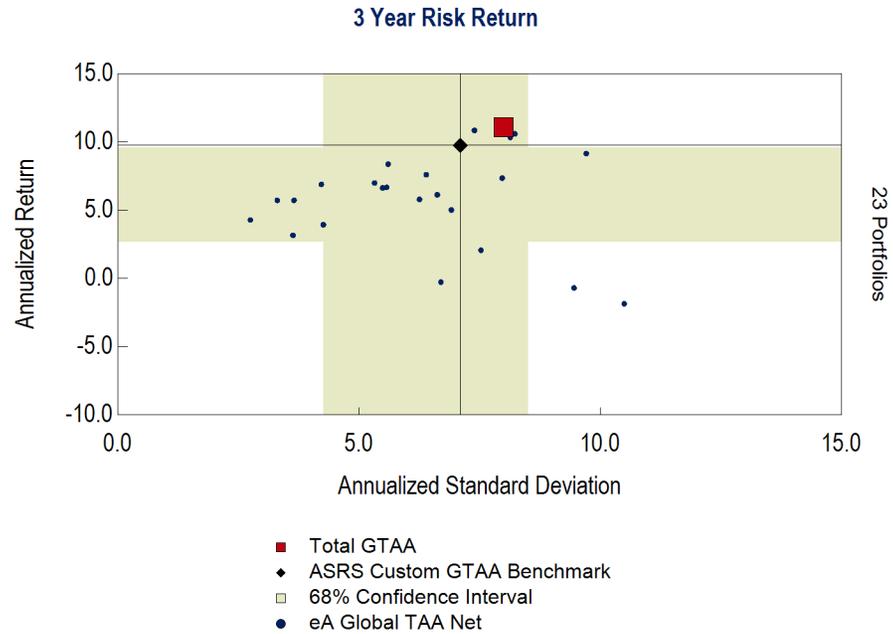


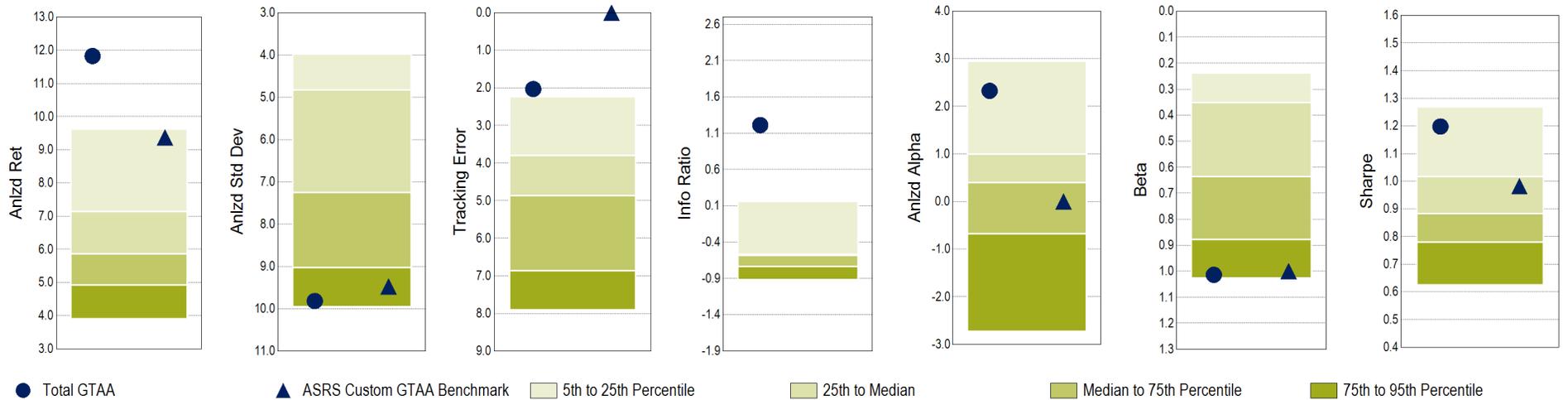
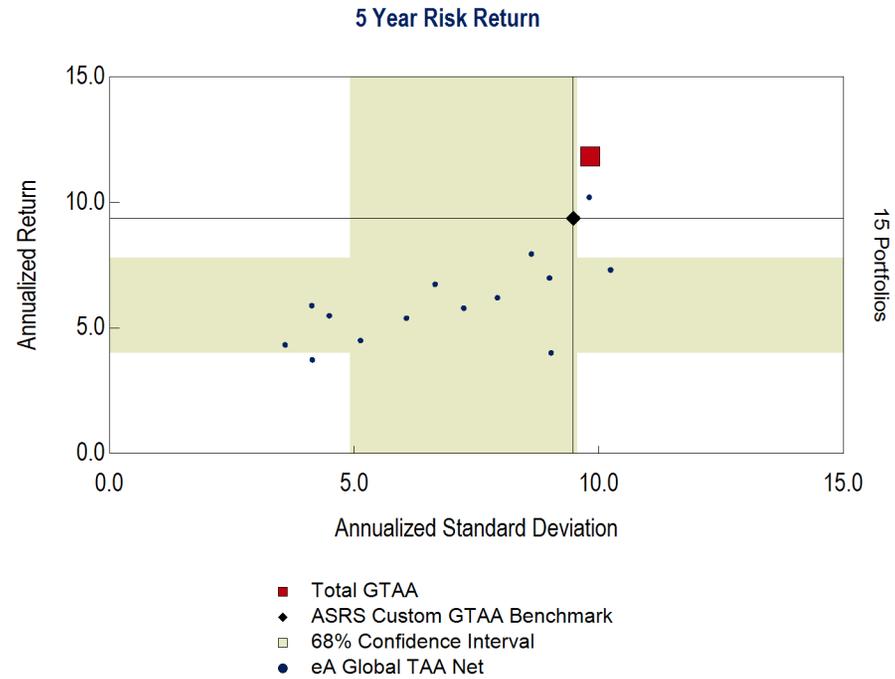
Rolling Annual Excess Benchmark Return



eA Global TAA Net Accounts







- **Seven Asset Class Committee meetings have been held since the last time we provided an update on the ASRS Asset Class Committee Meetings.**
  
- **February 27, 2015 – Private Markets Committee**
  - Monthly Status Report, General Discussion and Deal Flow
  - Real Estate Pipeline Discussion
    - Informational item to provide an update on real estate investment pipeline and to solicit guidance as necessary
  - Real Estate Manager Recommendation (\$100 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
    - The ASRS is currently invested with this manager in multiple funds across the ASRS private markets landscape
    - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
    - Committee approved the recommendation
  - Variance Request
    - RCLCO and the ASRS private markets team recommended the ASRS approve a variance request from an existing real estate manager to amend the financing criteria required to make an investment
      - Availability of bank debt remains highly constrained, and in order to obtain debt for this particular account, cross collateralized fund level debt is required
    - Committee approved the variance request, allowing up to \$75 million of ASRS capital to be invested in entities with a cross collateralized bank loan limited to an amount no greater than 45% loan to cost
  - Private Equity Manager Recommendation (\$50-\$75 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
    - The ASRS is currently invested with this manager in a prior fund
    - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
    - Committee approved the recommendation for \$50 million, delegating authority for the private markets team to increase the size of the investment up to \$75 million after an evaluation of the potential benefit of a fee break for increasing the size of the commitment

- **February 27, 2015 – Private Markets Committee (continued)**

- Private Debt Manager Recommendation – Additional Commitment (\$400 million; \$600 million original commitment)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt 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
- Private Debt Manager Recommendation – Additional Commitment (\$200 million; \$300 million original commitment)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt 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

- **March 19, 2015 – Ad Hoc Private Markets Committee**

- Private Debt Manager Recommendation (\$350 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt 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, subject to the concurrence of the Director, who was not present for the discussion. The Director subsequently concurred at the March 20, 2015 PRIVMC meeting.
- Private Debt Manager Recommendation (\$350 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
  - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
  - No recommendation was made at this meeting

- **March 20, 2015 – Private Markets Committee**

- Monthly Status Report, General Discussion and Deal Flow
- Real Estate Pipeline Discussion
  - Informational item to provide an update on real estate investment pipeline and to solicit guidance where appropriate
- Real Estate Manager Recommendation – Additional Commitment (\$100 million; \$100 million original 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
- Private Debt Manager Recommendation (\$350 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt 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
- Private Equity Manager Recommendation (\$100 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
  - The ASRS is currently invested with this manager in prior funds
  - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
  - Committee approved the recommendation
- Private Equity Manager Recommendation (\$80 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
  - The ASRS is currently invested with this manager in multiple funds across the ASRS private markets landscape
  - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
  - Committee approved the recommendation

• **March 20, 2015 – Private Markets Committee (continued)**

- Private Equity Manager Recommendation (\$100 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
  - The ASRS is currently invested with this manager in a prior fund
  - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
  - Committee approved the recommendation
- Opportunistic Equity Manager Recommendation (\$30 million co-investment)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Opportunistic Equity is 0%, with a range of 0%-3%)
  - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
  - Committee approved the recommendation
- Variance Request
  - RCLCO recommended the ASRS approve a variance request from an existing real estate manager to allow for the continued development of a property that will require a longer period of time to achieve stabilization than the investment guidelines require
    - Investment in question will require 4-5 years to achieve stabilization, while investment criteria require stabilization within 3 years
    - This was an error in the investment criteria language, which should have read that these types of investments will 'achieve stabilization within 3 years of completion of construction' rather than 3 years from the date of the initial investment in the asset
  - The Committee did not approve the variance request, but instead amended the investment criteria language accordingly
- Private Debt Manager Recommendation (\$350 million) – Follow Up from March 19, 2015 PRIVMC meeting
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt 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

- **March 27, 2015 – Private Markets Committee**

- Real Estate Pipeline Discussion
  - Informational item to provide an update on real estate investment pipeline and to solicit guidance where appropriate
- Real Estate Manager Recommendation – Additional Commitment (\$100 million; \$100 million original commitment)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
  - The ASRS is currently invested with this manager in multiple funds across the ASRS private markets landscape
  - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
  - Committee approved the recommendation
- Real Estate Manager Recommendation – (\$300 million)
  - 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

- **April 21, 2015– Private Markets Committee**

- Monthly Report, General Discussion and Deal Flow
  - Private Equity and Real Estate reporting reviewed. Reviewed separate account commitment strategy.
- Private Equity Manager Recommendation (€50 million)
  - 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
- Private Equity Manager Recommendation (\$50 million)
  - 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

- **May 18, 2015– Private Markets Committee**

- Monthly Report, General Discussion and Deal Flow
  - Real Estate reporting and commitment levels made to date reviewed.
- Real Estate Manager Commitment Increase Recommendation (\$200 million)
  - Recommendation to increase existing manager commitment from \$200 million to \$400 million .
  - 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
- Private Equity Pacing Plan Update
  - Committee approved a revised target of \$700 million in capital commitments in 2015.

- **June 4, 2015– Ad Hoc Private Markets Committee**

- Private Debt Manager Recommendation (\$10 million)
  - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt 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

## General Observations

- **The Fund continues to make significant progress moving the portfolio from the Interim SAAP toward the long-term SAAP.**
  - Current Interim SAAP includes proration of 1% Private Equity 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 (current actual is 4.4%).
    - \$3.7 billion in estimated exposure (12/31/2014 NAV + unfunded commitments) to private debt strategies equates to approximately 10.7% of Total Fund assets vs. the SAAP target of 10%.
  - Emerging Market Debt investment managers have been liquidated as the asset class was removed from the SAAP.
  - Multi-Asset Class Strategies (formerly GTAA) has been restructured and moved 'above the line' and now has an explicit 5% target within the SAAP.
  
- **Cash Assetization Program implemented:**
  - To facilitate fund liquidity by decreasing the settlement times and market frictions related to overall investment management.
  - To retain unleveraged Total Fund market (beta) exposure, and concurrently offset the hindrance on investment performance from maintaining sizeable transitional cash balances intended to meet fund payment obligations (e.g., pension, health supplement, LTD, fees, accounts payable and associated capital calls).
  
- **ASRS SAAP Benchmark evaluation is complete. New SAAP targets are effective April 1, 2015.**
  
- **Tactical positioning consistent with IMD House Views.**

# Market Environment Update and Outlook

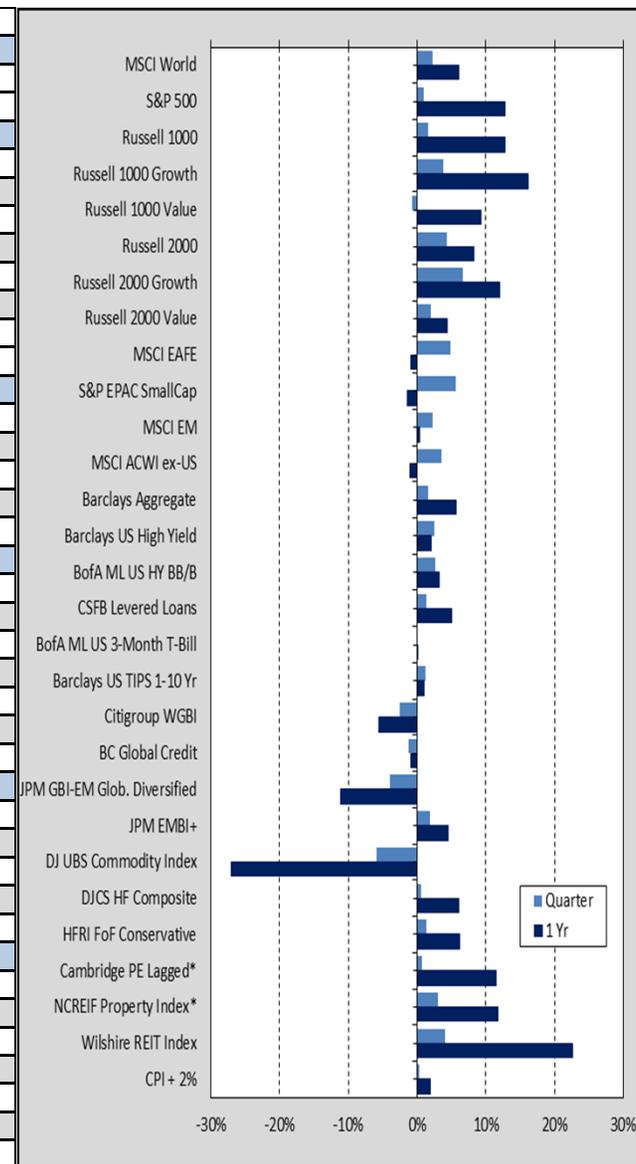


- **First quarter “advance” estimate of GDP growth printed at a weak -0.7%.**
  - Retail sales (ended March) at 0.5% on a year-over-year growth rate basis.
  - The inventory-to-sales ratio increased slightly to 1.4 in February and has remained relatively flat since early 2010.
  - Corporate profits as a percent of GDP decreased ended the fourth quarter at 10.4% and remain elevated relative to historical levels.
  - The U.S. trade deficit decreased slightly in February.
- **The unemployment rate fell to 5.5% in Q1 from 5.8% in December 2014; U-6, a broader measure of unemployment, fell to 10.9% during the first quarter.**
- **The Case-Shiller Home Price Index (as of 2/28) increased slightly to 166.8 from fourth quarter levels and is at levels higher than that of pre-financial crisis levels of 150.92.**
- **Rolling 12-month seasonally adjusted CPI decreased to -0.1% from 0.8% at the end of December; Capacity Utilization declined slightly to 77.1% in March.**
- **Fed Funds rate remains at 0.25%, while the 10-year Treasury Yield finished Q1 at 1.94%.**
- **The Fed balance sheet declined slightly in Q1 2015, while the European Central Bank balance sheet increased in the same period.**
  - ECB began asset purchases of €60 billion per month.
- **S&P valuations increased in March remaining above the 10-year and long-term averages**
  - Cyclically adjusted Shiller PE ratio is above the long-term average of 16.4x and above the 10-year average of 22.9x.
- **The U.S. Dollar continues to strengthen against a basket of major currencies as the Fed ends its quantitative easing program and the ECB ramps up easing.**

# Arizona State Retirement System

## Market Environment – Q1 2015 Overview

		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
<b>World Equity Benchmarks</b>						
MSCI World	World	2.3%	6.0%	12.2%	10.0%	6.4%
<b>Domestic Equity Benchmarks</b>						
S&P 500	Large Core	1.0%	12.7%	16.1%	14.5%	8.0%
Russell 1000	Large Core	1.6%	12.7%	16.5%	14.7%	8.3%
Russell 1000 Growth	Large Growth	3.8%	16.1%	16.3%	15.6%	9.4%
Russell 1000 Value	Large Value	-0.7%	9.3%	16.4%	13.8%	7.2%
Russell 2000	Small Core	4.3%	8.2%	16.3%	14.6%	8.8%
Russell 2000 Growth	Small Growth	6.6%	12.1%	17.7%	16.6%	10.0%
Russell 2000 Value	Small Value	2.0%	4.4%	14.8%	12.5%	7.5%
<b>International Equity Benchmarks</b>						
MSCI EAFE	International Developed	4.9%	-0.9%	9.0%	6.2%	5.0%
S&P EPAC SmallCap	Small Cap Int'l	5.6%	-1.5%	11.4%	9.2%	7.1%
MSCI EM	Emerging Equity	2.2%	0.4%	0.3%	1.8%	8.5%
MSCI ACWI ex-US	World ex-US	3.5%	-1.0%	6.4%	4.8%	5.5%
<b>Domestic Fixed Income Benchmarks</b>						
Barclays Aggregate	Core Bonds	1.6%	5.7%	3.1%	4.4%	4.9%
Barclays US High Yield	High Yield	2.5%	2.0%	7.5%	8.6%	8.2%
BofA ML US HY BB/B	High Yield	2.7%	3.2%	7.4%	8.4%	7.5%
CSFB Levered Loans	Bank Loans	1.3%	5.0%	5.3%	12.2%	5.0%
BofA ML US 3-Month T-Bill	Cash	0.0%	0.0%	0.1%	0.1%	1.5%
Barclays US TIPS 1-10 Yr	Inflation	1.2%	1.1%	-0.1%	2.9%	4.0%
<b>Global Fixed Income Benchmarks</b>						
Citigroup WGBI	World Gov. Bonds	-2.5%	-5.5%	-1.6%	3.4%	4.1%
BC Global Credit	Global Bonds	-1.2%	-0.9%	2.8%	4.4%	4.4%
JPM GBI-EM Glob. Diversified	Em. Mkt. Bonds (Local)	-4.0%	-11.1%	-3.9%	0.7%	6.3%
JPM EMBI+	Em. Mkt. Bonds	1.9%	4.5%	4.0%	6.6%	8.0%
<b>Alternative Benchmarks</b>						
DJ UBS Commodity Index	Commodity	-6.0%	-27.1%	-11.6%	-5.8%	-4.9%
DJCS HF Composite	Hedge Fund	0.6%	6.1%	2.4%	4.9%	3.1%
HFRI FoF Conservative	Fund of Funds	1.3%	6.2%	2.8%	4.6%	2.6%
Cambridge PE Lagged*	Private Equity	0.7%	11.5%	15.3%	15.4%	13.6%
NCREIF Property Index*	Real Estate	3.0%	11.8%	11.1%	12.1%	8.4%
Wilshire REIT Index	REIT	4.0%	22.7%	14.0%	15.4%	6.7%
CPI + 2%	Inflation/Real Assets	0.3%	2.0%	3.0%	3.7%	4.1%



\* As of 12/31/2014

## Positives

- **With Fed asset purchases coming to an end, divergence in monetary policies signaling different investment environments globally**
- **ECB monetary easing begins with €60 billion in monthly asset purchases**
  - ECB commits €1.3 trillion in asset purchases in the Eurozone
  - Global risk assets respond positively
  - Negative short dated interest rates in Eurozone
- **Developed world inflation is low**
  - In US, CPI for all Urban Consumers on a seasonally adjusted basis was negative in Q1 driven by Energy in January

## Negatives

- **Geopolitical instability continues to drive volatility**
  - Instability in the Mid-East, Eastern Europe, Greece
- **Fed rate hike uncertainty contributed to volatility in domestic markets**
  - Timing of Fed rate hike is “dependent on market conditions”
- **Europe continues to see ongoing political and economic growth challenges**
  - Negative currency impacts for US investors as USD appreciates
- **GDP decelerated, posting a +0.2% estimated growth rate**
  - Consumer spending decelerated, but still growing
- **Valuations remain above 10 year and long term averages**
  - Developed Equity P/Es above median

### **Global Equity**

- **U.S. equities advanced in the first quarter as global monetary accommodation ramps up.**
- **Small cap stocks outperformed large cap stocks during the quarter, with the Russell 2000 Index returning 4.3% and the S&P 500 Index returning 1.0%.**
- **International equities outperformed U.S. markets during the quarter, returning 3.5%, as measured by the MSCI ACWI ex-U.S. Index.**
  - Developed markets returned 4.9% as measured by the MSCI EAFE Index. Japan was the top performer returning 10.0%.
  - Emerging markets returned 2.2% as measured by the MSCI Emerging Markets Index in U.S. dollar terms. India and Russia bolstered returns with Russia returning 18%.

### **Private Equity**

- **New private equity commitments totaled \$83.1 billion in Q1 2015.**
  - 2015 first three month total represents 23% of total PE raised in 2014
- **Buyout and growth equity fund deal volume in both the U.S. and Europe continues to decelerate.**
  - Buyout and growth equity deals totaled \$36.7 billion with US buyout and growth equity activity experiencing a sharp reduction in Q1.
- **Venture capital raised \$11.8 billion ended March.**
  - At 14% of total private equity raised, commitments are just below the 10-year historic relative average and are buoyed by strong IPO and M&A environment.
- **Energy funds raised \$3.2 billion representing 16% of capital raised in Q1.**
  - Investors are opportunistically approaching the energy market dislocation.
- **Asian private equity commitments slowed to total 8% of total funds raised down from 10% in 2014.**
- **European commitments comprised 14% of all new PE commitments in Q1 2015**
  - 72% of European funds raised were based in the United Kingdom

**Fixed Income**

- **As yields fell amid declining inflation and monetary easing, global sovereign debt gained in the first quarter.**
- **The spread between two and 10-year rates fell 12 basis points to 1.38%. Treasury Inflation-Protected Securities, or TIPS, returned 1.4% during the quarter, as measured by the Barclays US TIPS Index.**
- **The Barclays Long Duration Credit Index gained 3.1%, bolstered by falling Treasury yields.**
- **Agency mortgage-backed securities benefitted from a decrease in mortgage rates in January and March, and posted quarterly gains of 1.1%.**
- **Investment grade credit spreads continued to widen ending March at 129 basis points.**
- **High yield bonds returned 2.5% as spreads increased to 433 basis points up from 429 basis points.**
  - High yield markets were most significantly impacted by the decline of oil prices as Energy makes up approximately 14% of the Barclays US High Yield Bond Index.
- **Emerging markets debt continued to slow in local currency posting a -4.0% return as measured by the JP Morgan GBI-EM Global Diversified Index.**
  - Hard-currency emerging market debt market trumped local currency debt, with the JPMorgan EMBI Global Diversified Index returning 2.0%. After plunging at year-end, Russian debt outperformed as oil prices stabilized and geopolitical tensions cooled. Brazilian debt underperformed amid disappointing growth, high inflation, and concerns around the mismanagement of the state-run oil giant Petrobras.

**Real Assets/Inflation-Linked Assets**

- **Massive energy market dislocation.**
  - Oil prices stabilized mid quarter.
  - Private equity and private debt opportunities attractive.
  - Potential for public stressed/distressed credit, equity and commodity plays.
- **OPEC and Saudi Arabia have indicated a willingness to allow lower oil prices to persist in efforts to cement market share and reduce marginal supply.**
- **Select infrastructure opportunities are attractive.**
  - Target opportunistic strategies in niche sub-sectors to take advantage of market dislocations.
- **NEPC continues to believe in the long-term demand drivers in agriculture.**
  - Long-term commodity prices driven by growing emerging market demand.
- **Timber opportunity set limited but warrants further review**
  - 45% increase in housing starts forecasted; timber prices highly correlated

### Commodities

- **Commodities continued their losing streak for the third straight quarter with the Bloomberg Commodity Index posting a 5.9% loss.**
  - Volatility in the commodity sector trumped other asset classes, including equities, bonds and the US dollar; Brent crude dropped 9.9% in January, then sharply recovered, gaining 14.8% in February, and slipped again in March, losing 12.3% posting at a 9.3% Q1 loss.

### 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.**
  - The concerns for U.S. core real estate (and U.S. real estate, broadly) continues to be plentiful capital that is driving up pricing; and the market's expectation for higher future interest rates and their impact on capitalization rates and capital values.
- **U.S. REITs posted a strong quarter with a 4.0% return.**
  - REITs are trading at slight premiums to NAV
  - FFO multiples are up to approximately 18x remaining above the average of 12.5x since 2000.
- **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.

- **Be judicious with risk**
  - Avoid chasing risk for only marginal return enhancements
  - Less liquid opportunities may provide the best risk-adjusted approach, but liquidity needs should be incorporated (e.g., substituting direct lending for high yield)
- **Catalysts are present to drive international equity markets above pre-financial crisis highs**
  - Encourage an equal weight exposure to international developed and US equities
  - If currency hedged, encourage larger international developed equity exposure relative to US equities
- **Question the “traditional” approach; different investment environments require different perspectives of risk and return**
  - A low-return environment may require a fresh perspective
  - Continue to remove traditional portfolio constraints by adding active managers with skill to exploit inefficiencies within and across asset classes (e.g., flexible global equity, global asset allocation, absolute return fixed income)
- **Rethink fixed income portfolio structure in light of current market environment**
  - Use of an unconstrained/multi-sector fixed income portfolio may provide sound diversification and enhanced liquidity
  - Examine if alternatives are available to traditional portfolio positions (e.g., combining cash and long treasuries vs. holding core bond portfolio)

## Highlights of First Quarter Happenings at NEPC

### NEPC Research

#### Recent White Papers Posted

- *Six Years Later: A Time for Moderation? NEPC's 2015 Asset Allocation (January 2015)* - NEPC's Asset Allocation Committee
- *A Primer on US Equity REITs and Their Role in an Institutional Investment Portfolio (April 2015)* - Sean Ruhmann, Director of Real Assets Research; Tim Bruce, Director of Traditional Research; Matt Ritter, Research Analyst, Real Assets Research; Larissa Davy, Research Associate, Traditional Research - The NEPC research paper provides an overview of US REITs and examines their place in institutional portfolios.



### Professional Staff Updates

- We are also pleased to announce that Aarish Patell has joined NEPC as a Research Consultant located in our Boston, MA office. Aarish will be focusing on private markets research.
- NEPC has also added two new Research Analysts to our hedge fund research team, Christian Pieri and Victoria Margosian.

### NEPC Client Recognitions

- We are immensely gratified to consistently achieve your favorable client satisfaction ratings in relation to our peers. Last year, you ranked NEPC #1 among the 10 largest firms in the investment consulting business, as measured by the Greenwich Quality Index (GQI). We remain the only firm among the 10 largest investment consultancies with rankings in the top three in 10 of the last 11 years, according to Greenwich Associates' annual survey of over 1,000 large plan sponsors regarding their investment consulting relationships.<sup>1</sup>
- Orange County Employee Retirement System has won the Government Finance Officers Association's Award for Excellence in Government Finance, for its investment fee transparency and management initiatives.

### Upcoming Events

- NEPC's 20th Annual Client Conference – May 19-20, 2015 in Boston at the Boston Convention & Exhibition Center (BCEC)
- Headline Speakers:
  - Liz Ann Sonders, Senior Vice President, Chair of the Investment Committee, Windhaven Investment Management, Inc.
  - Don Yaeger, Sports Journalist
  - Rick Rieder, Chief Investment Officer, Fundamental Fixed Income, BlackRock
- Register at [www.nepc.com](http://www.nepc.com)

<sup>1</sup>Source: Greenwich Associates, 2014 Evaluations by U.S. Institutional Investors. Greenwich Associates is an independent research firm. Its rankings do not represent an endorsement of NEPC. Past performance is no guarantee of future results.

## 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.<sup>1</sup>/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: 25% S&P 500/5% S&P 400/5% S&P 600/14% MSCI EAFE/3% MSCI EAFE Small Cap/6% MSCI Emerging Markets/6% Russell 2000 (lagged one quarter)/14% 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)/6% NCREIF ODCE (lagged one quarter)/4% Bloomberg Commodity Index

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

<sup>1</sup>MSCI 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.<sup>1</sup> 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 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, and 15% 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 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 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.
- **ASRS Custom GTAA 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 thereafter.

<sup>1</sup>MSCI 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.



## Information Disclaimer and Reporting Methodology

### Information Disclaimer

- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques are not guaranteed to ensure profit or protect against losses.
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### Reporting Methodology

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.