Arizona State Retirement System

Independent ASRS Investment Program Oversight for the Period Ending March 31, 2014

June 23, 2014

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ASRS Investment Objectives/Performance

Note: All of the data shown on the following pages is as of March 31, 2014 and reflects the deduction of investment manager fees, unless otherwise noted.

ASRS Investment Objectives

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

Total Fund Performance

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

	20 Year Annualized Return
Total Fund	8.6%
Constant 8%	8.0%
Excess Return	0.6%

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)
Total Fund	2.3%	**13.8%**	**9.6%**	15.9%	7.0%	10.0%
Interim SAA Policy[1]	2.4%	**13.9%**	**9.5%**	15.7%	6.9%	9.8%
Excess Return	-0.1%	**-0.1%**	**0.1%**	0.2%	0.1%	0.2%

1 Year Goal Met: No
3 Year Goal Met: Yes

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

Total Fund Attribution Analysis

Total Plan	1 Year	3 Years	5 Years
Allocation Effect[1]	1.08%	0.27%	0.07%
Manager Selection Effect[2]	-1.34%	-0.19%	0.03%
Interaction Effect[3]	0.11%	0.08%	0.24%
Residual[4]	0.06%	-0.02%	-0.10%
Excess Return	**-0.09%**	**0.14%**	**0.24%**

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:

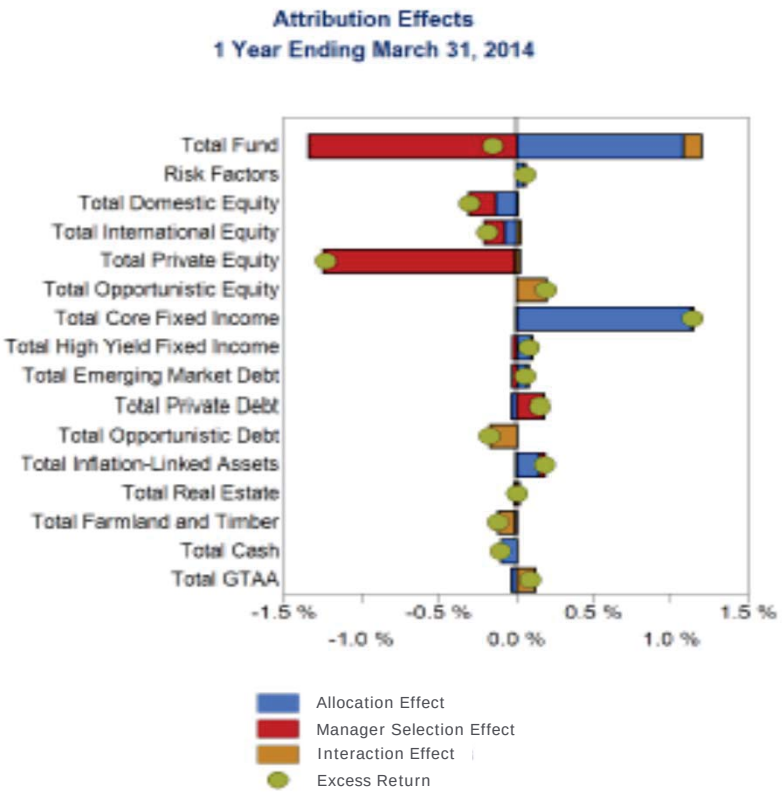
1. Allocation Effect: Measures the impact of the decision to over/under weight assets classes relative to Interim SAAP weights**.** (Return Asset Class Index – Total Interim Policy Index Return) × (Weight Asset Class Portfolio – Weight Asset Class Interim Policy Index)

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. 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))

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

Total Fund Attribution Detail



1 Year Excess Return: -0.09%

- Allocation Effect: +1.08%
  - Public Markets Fixed Income tactical underweight (+1.30%)
  - Commodities tactical underweight (+0.15%)
  - Domestic Equity tactical underweight (-0.14%)
  - International Equity tactical underweight (-0.08%)
- Manager Selection Effect: -1.34%
  - Private Equity underperformed due to various managers (-1.23%)
  - Domestic Equity underperformed due to small cap managers (-0.17%)
  - Private Debt outperformed due to various managers (+0.18%)
- Interaction Effect: +0.11%
  - Opportunistic Equity outperformed due to various managers (+0.19%)
  - GTAA outperformed due to Bridgewater (+0.12%)
  - Opportunistic Debt underperformed due to various managers (-0.17%)
- Residual: 0.06%

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:

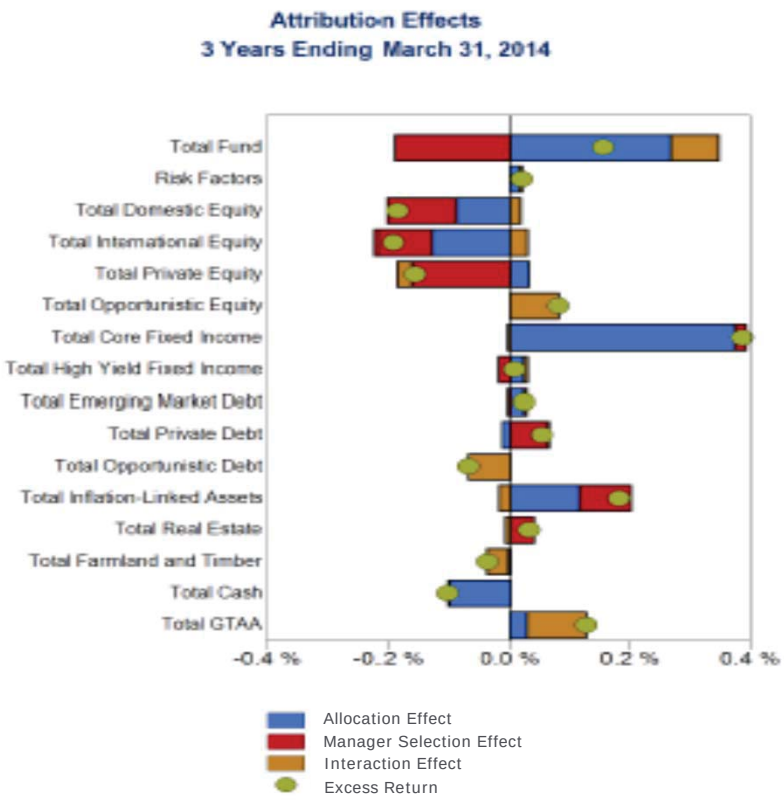
Allocation Effect: Measures the impact of the decision to over/under weight assets classes relative to Interim SAAP benchmark weights**.** (Return Asset Class Index – Total Interim Policy Index Return) × (Weight Asset Class Portfolio – Weight Asset Class Interim Policy Index)

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))

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

Total Fund Attribution Detail



3 Year Excess Return: +0.14%

- Allocation Effect: +0.27%
  - Public Markets Fixed Income tactical underweight (+0.41%)
  - Commodities tactical underweight (+0.12%)
  - International Equity tactical underweight (-0.13%)
- Manager Selection Effect: -0.19%
  - Private Equity underperformed due to various managers (-0.17%)
  - Domestic Equity underperformed due to various managers (-0.11%)
  - International Equity underperformed due to various managers (-0.09%)
  - Commodities outperformed due to Gresham (+0.08%)
- Interaction Effect: +0.08%
  - GTAA outperformed due to Bridgewater (+0.10%)
  - Opportunistic Equity outperformed due to various managers (+0.08%)
  - Opportunistic Debt underperformed due to various managers (-0.07%)
- 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:

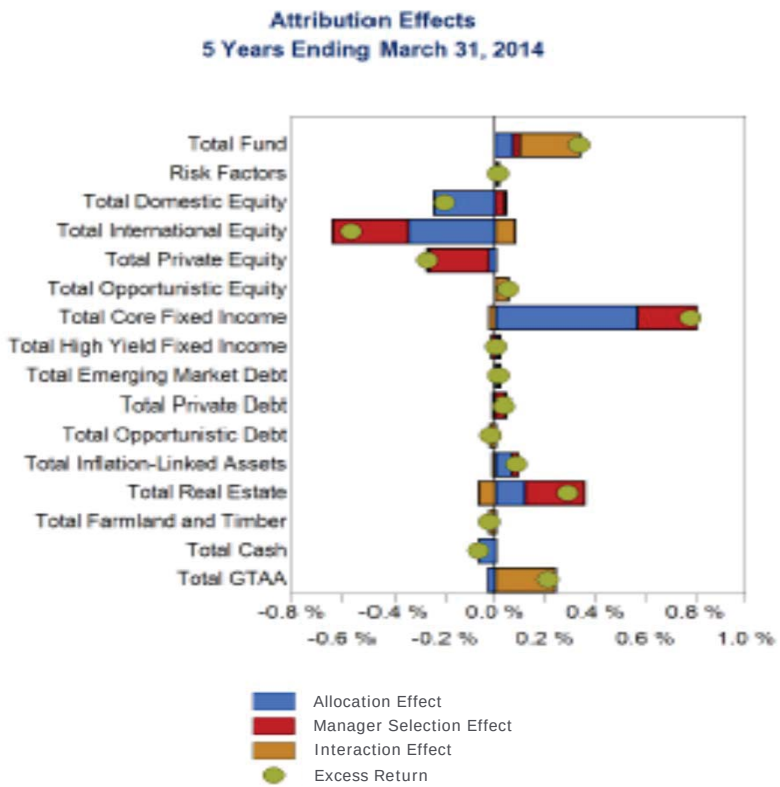
Allocation Effect: Measures the impact of the decision to over/under weight assets classes relative to Interim SAAP benchmark weights**.** (Return Asset Class Index – Total Interim Policy Index Return) × (Weight Asset Class Portfolio – Weight Asset Class Interim Policy Index)

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))

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

Total Fund Attribution Detail



5 Year Excess Return: +0.24%

- Allocation Effect: +0.07%
  - Public Markets Fixed Income tactical underweight (+0.59%)
  - Real Estate underweight (+0.12%)
  - International Equity tactical underweight (-0.35%)
  - Domestic Equity tactical underweight (-0.24%)
- Manager Selection Effect: +0.03%%
  - Public Markets Fixed Income outperformed due to various managers (+0.24%)
  - Real Estate outperformed due to various managers (+0.24%)
  - International Equity underperformed due to various managers (-0.29%)
  - Private Equity underperformed due to various managers (-0.24%)
- Interaction Effect: +0.24%
  - GTAA outperformed due to Bridgewater (+0.24%)
- Residual: -0.10%

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 assets 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)

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))

Residual: Contribution to excess return not captured in Allocation Effect, Manager Selection Effect and Interaction 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]	18.5%	11.2%
ASRS Custom Total Equity Benchmark	18.8%	11.5%
Excess Return	-0.3%	-0.3%
ASRS Domestic Equity	22.1%	14.3%
ASRS Custom Domestic Equity Benchmark	22.7%	14.7%
Excess Return	-0.6%	-0.4%
ASRS International Equity	12.9%	5.2%
ASRS Custom Int'l Equity Benchmark	13.4%	5.4%
Excess Return	-0.5%	-0.2%
ASRS Public Markets Fixed Income	-0.3%	4.3%
ASRS Custom Fixed Income Benchmark	0.4%	4.3%
Excess Return	-0.7%	0.0%
ASRS Inflation-Linked	-1.3%	-5.2%
ASRS Custom Inflation-Linked Benchmark	-2.1%	-6.9%
Excess Return	0.8%	1.7%
ASRS GTAA	14.6%	10.6%
ASRS Custom GTAA Benchmark	13.6%	9.7%
Excess Return	1.0%	0.9%

[1]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[1]

- 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	15.0%	15.4%	12.9%	Oct-07
Russell 2000	38.8%	15.7%	17.3%	
Excess Return	-23.8%	-0.3%	-4.4%	
ASRS Opportunistic Equity[2]	43.5%	--	40.7%	Apr-11
ASRS Private Debt	17.8%	--	17.2%	Jul-12
S&P/LSTA Levered Loan Index + 250 bps	7.8%	--	8.4%	
Excess Return	10.0%	--	8.8%	
ASRS Opportunistic Debt[2]	8.4%	8.5%	12.1%	Jan-08
ASRS Real Estate	13.2%	13.2%	5.6%	Oct-05
NFI - ODCE Index	12.9%	12.5%	4.8%	
Excess Return	0.3%	0.7%	0.8%	
ASRS Farmland and Timber	--	--	1.1%	Jul-13
CPI ex-Food and Energy + 350 bps	--	--	1.2%	
Excess Return	--	--	-0.1%	

[1]Performance of private markets portfolios and corresponding benchmarks is reported on a one quarter lag. Performance shown as of December 31, 2013.

[2]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	Cash In	Cash Out	Balance as of 1st Business Day
Apr-13	$223,752,576	($182,003,067)	$65,075,125
May-13	$466,869,533	($182,469,344)	$285,187,177
Jun-13	$357,254,932	($182,835,622)	$212,223,877
Jul-13	$490,407,958	($185,679,872)	$307,287,872
Aug-13	$364,853,179	($188,310,189)	$205,962,942
Sep-13	$303,470,007	($189,505,809)	$95,194,585
Oct-13	$404,897,845	($190,046,089)	$200,202,122
Nov-13	$213,012,636	($190,661,495)	$126,730,318
Dec-13	$560,544,992	($190,590,864)	$317,630,570
Jan-14	$386,764,591	($190,949,369)	$352,809,530
Feb-14	$210,787,413	($191,680,149)	$189,010,112
Mar-14	$679,587,225	($192,454,469)	$486,243,101

All Pension Obligations, Capital Calls and Other Requirements Met with Available Cash

Goal Met: Yes

Note:

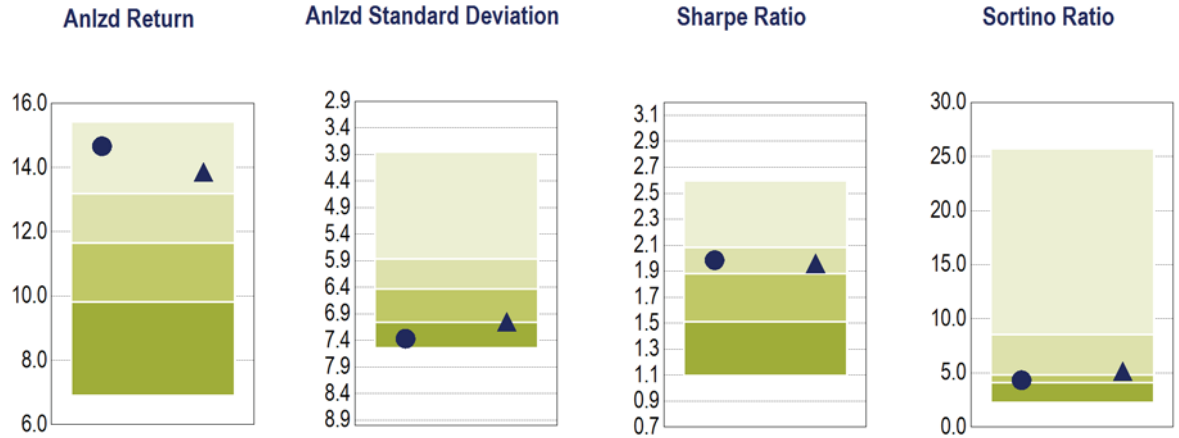
Cash In - The balance as of the business day prior to the monthly pension run payment, comprised of month-to-date contributions and excess cash held to fund manager(s) or as a tactical allocation.

Cash Out - The monthly pension run payment.

Total Fund Risk Statistics vs. Peer Universe

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

1 Year



	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
● Total Fund				
Value	14.7	7.4	2.0	4.3
%tile	12	91	37	69
▲ Interim SAA Policy				
Value	13.9	7.1	2.0	5.1
%tile	18	78	39	43
Universe				
5th %tile	15.4	3.9	2.6	25.7
25th %tile	13.2	5.9	2.1	8.6
Median	11.7	6.4	1.9	4.9
75th %tile	9.8	7.0	1.5	4.1
95th %tile	6.9	7.5	1.1	2.3

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 not 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.

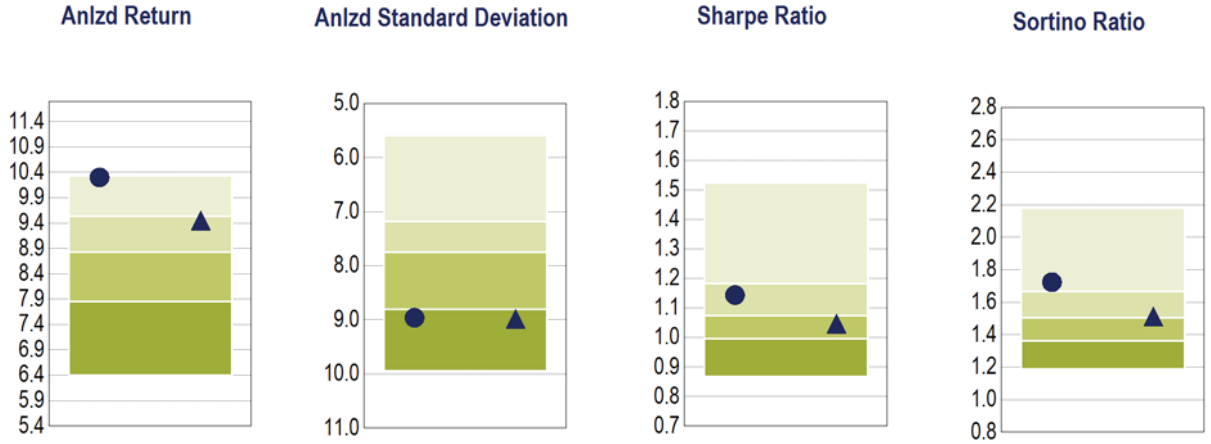
The InvestorForce Public Funds > $1 Billion Universe contains 56 observations for the one-year period ending March 31, 2014, with total assets of $512.8 billion.

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



	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
● Total Fund				
Value	10.3	9.0	1.1	1.7
%tile	6	81	30	20
▲ Interim SAA Policy				
Value	9.5	9.0	1.0	1.5
%tile	28	81	58	49
Universe				
5th %tile	10.3	5.6	1.5	2.2
25th %tile	9.5	7.2	1.2	1.7
Median	8.8	7.7	1.1	1.5
75th %tile	7.9	8.8	1.0	1.4
95th %tile	6.4	9.9	0.9	1.2

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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.

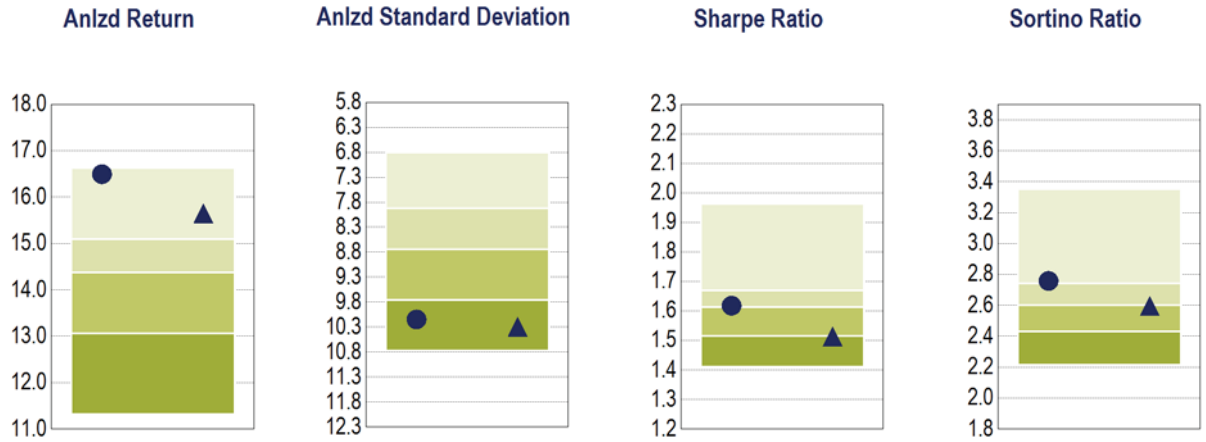
The InvestorForce Public Funds > $1 Billion Universe contains 56 observations for the three-year period ending March 31, 2014, with total assets of $512.8 billion.

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)

5 Year



	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
● Total Fund				
Value	16.5	10.1	1.6	2.8
%tile	6	83	48	25
▲ Interim SAA Policy				
Value	15.7	10.3	1.5	2.6
%tile	17	84	77	53
Universe				
5th %tile	16.6	6.8	2.0	3.3
25th %tile	15.1	7.9	1.7	2.7
Median	14.4	8.7	1.6	2.6
75th %tile	13.1	9.7	1.5	2.4
95th %tile	11.3	10.8	1.4	2.2

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 not 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.

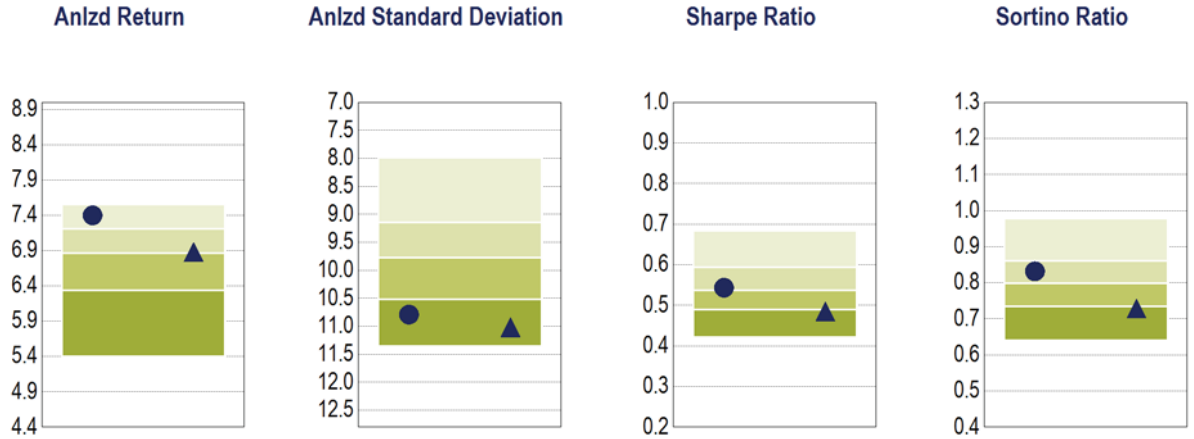
The InvestorForce Public Funds > $1 Billion Universe contains 56 observations for the five-year period ending March 31, 2014, with total assets of $512.8 billion.

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)

10 Year



	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
● Total Fund				
Value	7.4	10.8	0.5	0.8
%tile	11	84	49	38
▲ Interim SAA Policy				
Value	6.9	11.0	0.5	0.7
%tile	50	89	77	77
Universe				
5th %tile	7.5	8.0	0.7	1.0
25th %tile	7.2	9.1	0.6	0.9
Median	6.9	9.8	0.5	0.8
75th %tile	6.3	10.5	0.5	0.7
95th %tile	5.4	11.3	0.4	0.6

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 not 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.

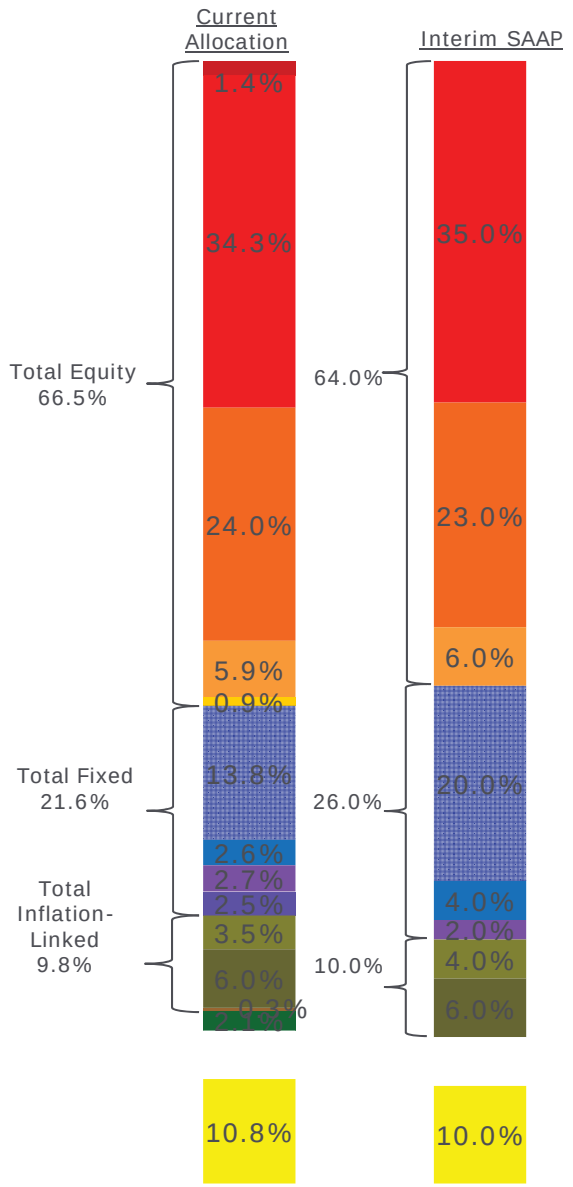
The InvestorForce Public Funds > $1 Billion Universe contains 53 observations for the ten-year period ending March 31, 2014, with total assets of $512.8 billion.

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, 2014 and reflects the deduction of investment manager fees, unless otherwise noted.

SAA Policy Compliance



	Current Mkt Value	Current Allocation	Interim SAAP	Difference	Policy Range	Within Range
Total Domestic and International Equity[1]	**$20,149,786,746**	**59.8%**	**59.0%**	**0.8%**		
Domestic Equity[3]	**$11,563,664,969**	**34.3%**	**35.0%**	**-0.7%**	**26% - 38%**	**Yes**
U.S. Large Cap[2]	*$8,426,785,387*	*25.0%*	*25.0%*	*0.0%*		
U.S. Mid Cap	*$1,562,975,541*	*4.6%*	*5.0%*	*-0.4%*		
U.S. Small Cap	*$1,573,904,041*	*4.7%*	*5.0%*	*-0.3%*		
International Equity[3]	**$8,099,076,991**	**24.0%**	**23.0%**	**1.0%**	**16% - 28%**	**Yes**
Developed Large Cap[2]	*$4,935,470,654*	*14.6%*	*14.0%*	*0.6%*		
Developed Small Cap	*$1,290,418,965*	*3.8%*	*3.0%*	*0.8%*		
Emerging Markets	*$1,873,187,373*	*5.6%*	*6.0%*	*-0.4%*		
Private Equity[4]	**$1,971,690,807**	**5.9%**	**6.0%**	**-0.1%**	**5% - 9%**	**Yes**
Opportunistic Equity[4,6]	**$289,397,630**	**0.9%**	**0.0%**	**0.9%**	**0% - 3%**	**Yes**
Total Equity	**$22,410,875,183**	**66.5%**	**64.0%**	**2.5%**	**53% - 70%**	**Yes**
U.S. Fixed Income	**$4,658,662,454**	**13.8%**	**20.0%**	**-6.2%**	**8% - 28%**	**Yes**
Core[2]	*$3,430,525,494*	*10.2%*	*15.0%*	*-4.8%*		
High Yield	*$1,228,136,960*	*3.6%*	*5.0%*	*-1.4%*		
Emerging Market Debt	**$880,235,877**	**2.6%**	**4.0%**	**-1.4%**		
Private Debt[4]	**$914,859,250**	**2.7%**	**2.0%**	**0.7%**		
Opportunistic Debt[4,6]	**$835,678,506**	**2.5%**	**0.0%**	**2.5%**	**0% - 10%**	**Yes**
Total Fixed Income	**$7,289,436,087**	**21.6%**	**26.0%**	**-4.4%**	**15% - 35%**	**Yes**
Commodities[2]	**$1,168,169,375**	**3.5%**	**4.0%**	**-0.5%**	**1% - 7%**	**Yes**
Real Estate[2,4]	**$2,038,460,914**	**6.0%**	**6.0%**	**0.0%**	**6% - 10%**	**Yes**
Infrastructure	**$0**	**0.0%**	**0.0%**	**0.0%**	**0% - 3%**	**Yes**
Farmland and Timber[4]	**$95,259,926**	**0.3%**	**0.0%**	**0.3%**	**0% - 3%**	**Yes**
Opportunistic Inflation-Linked[6]	**$0**	**0.0%**	**0.0%**	**0.0%**	**0% - 3%**	**Yes**
Total Inflation-Linked	**$3,301,890,215**	**9.8%**	**10.0%**	**-0.2%**	**8% - 16%**	**Yes**
Cash[5]	**$693,672,800**	**2.1%**	**0.0%**	**2.1%**		
Total	**$33,695,874,285**	**100.0%**	**100.0%**	**0.0%**		
Global Tactical Asset Allocation (GTAA)[2]	**$3,632,165,447**	**10.8%**	**10.0%**	**0.8%**	**5% - 15%**	**Yes**

[1]Total Domestic and International Equity includes Equity Risk Factor Portfolio with assets of $487.0 million.

[2]GTAA allocation distributed into U.S. Large Cap Equity, Int'l Developed Large Cap Equity, Core Fixed Income, Commodities and Real Estate.

[3]Domestic and International Equity market values include residual values remaining in terminated manager accounts.

[4]Values shown for private markets portfolios include cash flows that occurred during 1Q2014.

[5]Cash includes money for the upcoming monthly pension distribution. Value shown also includes assets in liquidating GTAA account.

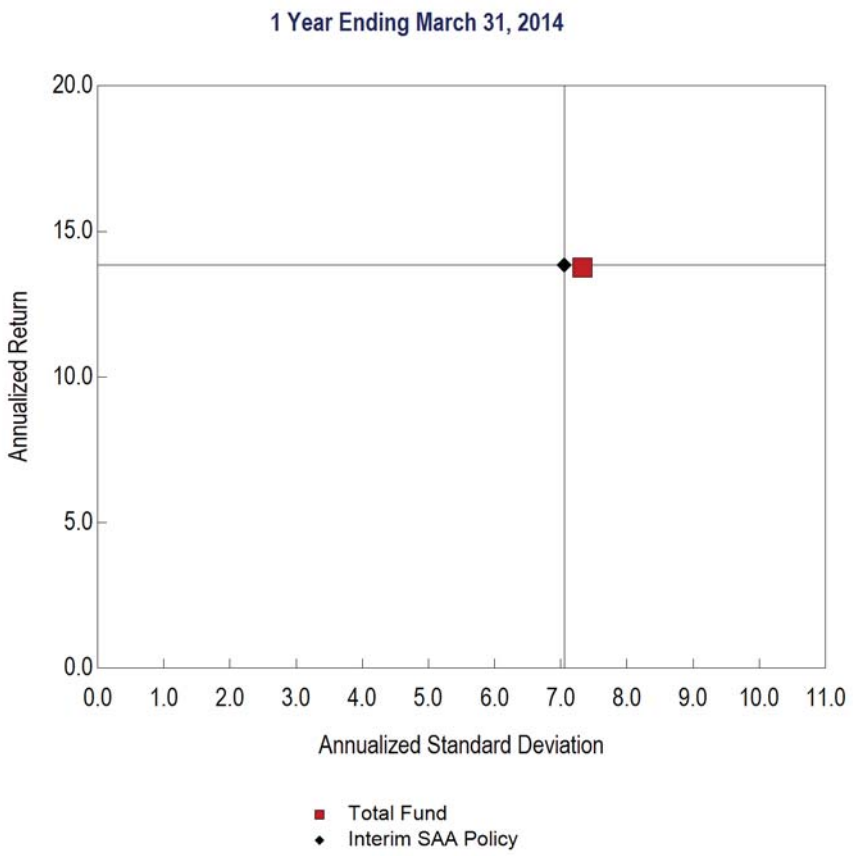
[6]Aggregate Opportunistic asset classes not to exceed 10%.

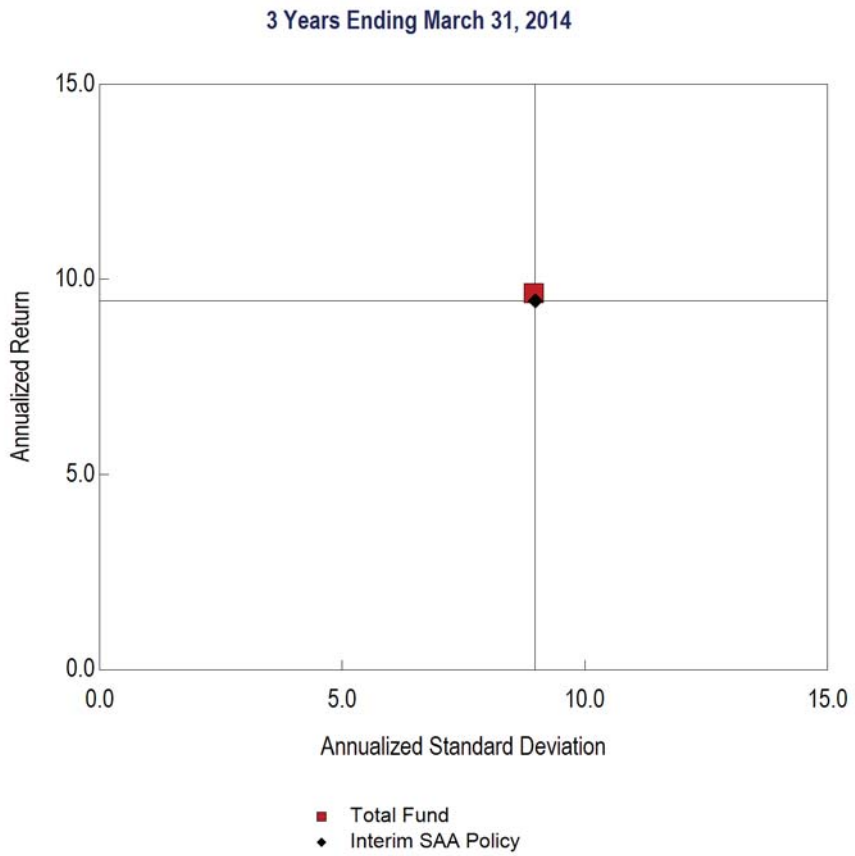
Note: Interim SAA Policy includes proration of 1% Private Equity, 1% Private Debt and 2% Real Estate, which are unfunded.

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.

Total Fund Analysis





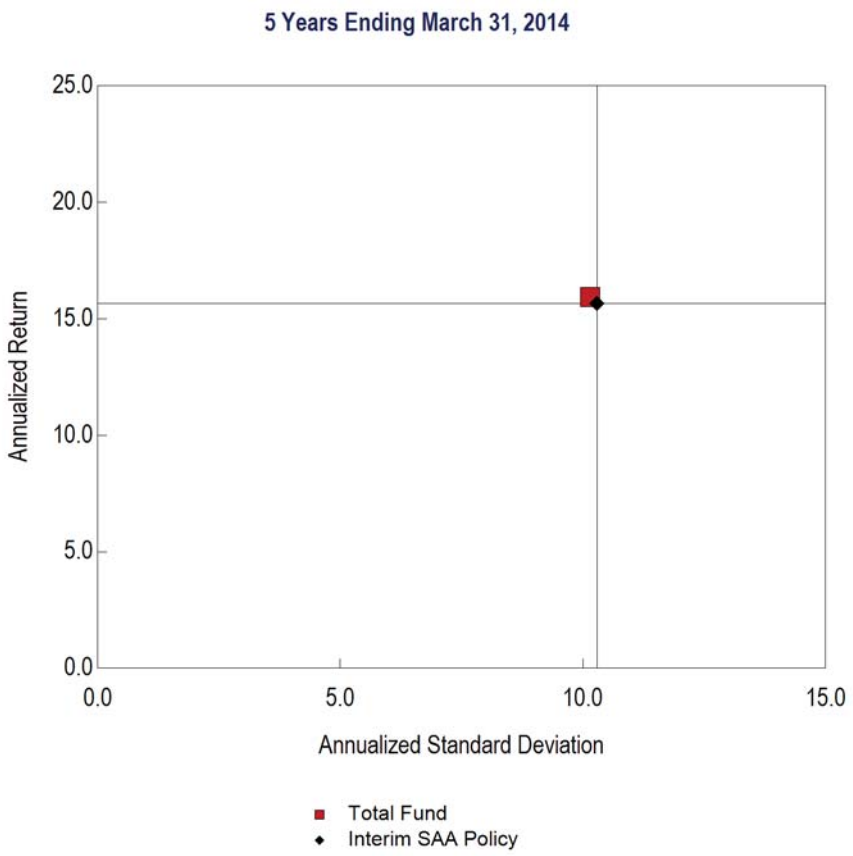
1 Year Ending March 31, 2014

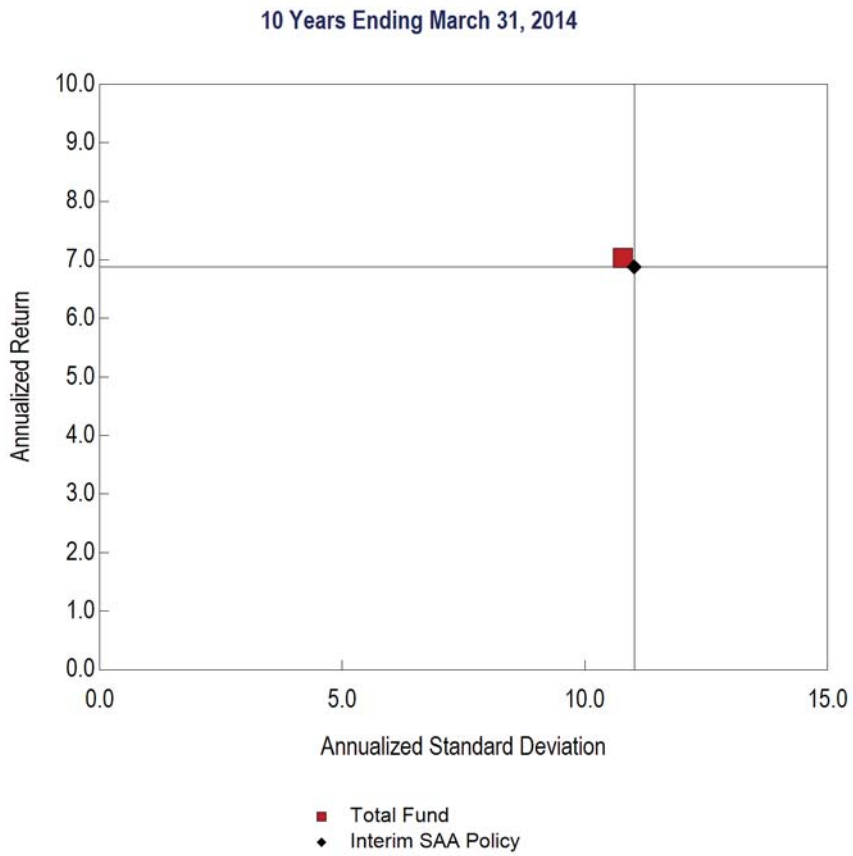
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	13.8%	7.3%	1.9	4.0
Interim SAA Policy	13.9%	7.1%	2.0	5.1

3 Years Ending March 31, 2014

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	9.6%	8.9%	1.1	1.6
Interim SAA Policy	9.5%	9.0%	1.0	1.5

Total Fund Analysis





5 Years Ending March 31, 2014

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	15.9%	10.1%	1.6	2.7
Interim SAA Policy	15.7%	10.3%	1.5	2.6

10 Years Ending March 31, 2014

	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio
Total Fund	7.0%	10.8%	0.5	0.8
Interim SAA Policy	6.9%	11.0%	0.5	0.7

Asset Class Performance Summary - Public Markets

	Market Value ($)	% of Portfolio	3 Mo (%)	Rank	9 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Since
Total Fund	**33,695,874,285**	**100**	**2.3**	**--**	**13.9**	**--**	**13.8**	**--**	**9.6**	**--**	**15.9**	**--**	**7.0**	**--**	**10.0**	**Jul-75**
Interim SAA Policy			*2.4*	--	*13.8*	--	*13.9*	--	*9.5*	--	*15.7*	--	*6.9*	--	*9.8*	*Jul-75*
Over/Under			-0.1		0.1		-0.1		0.1		0.2		0.1		0.2	
Actual Benchmark			*2.5*	--	*14.4*	--	*14.8*	--	*9.7*	--	*15.2*	--	*6.9*	--	--	*Jul-75*
Total Domestic and International Equity[1]	**18,049,361,124**	**53.6**	**1.5**	**--**	**17.9**	**--**	**18.5**	**--**	**11.2**	**--**	**20.0**	**--**	**7.5**	**--**	**6.9**	**Jan-98**
ASRS Custom Total Equity Benchmark			*1.4*	--	*18.3*	--	*18.8*	--	*11.5*	--	*20.3*	--	*7.6*	--	*6.2*	*Jan-98*
Over/Under			0.1		-0.4		-0.3		-0.3		-0.3		-0.1		0.7	
Total Domestic Equity	**10,458,781,171**	**31.0**	**1.8**	**48**	**19.0**	**63**	**22.1**	**62**	**14.3**	**42**	**22.5**	**49**	**8.3**	**60**	**11.4**	**Jul-75**
ASRS Custom Domestic Equity Benchmark			*1.9*	*45*	*19.4*	*60*	*22.7*	*57*	*14.7*	*36*	*22.4*	*50*	*8.0*	*67*	*11.4*	*Jul-75*
Over/Under			-0.1		-0.4		-0.6		-0.4		0.1		0.3		0.0	
eA All US Equity Net Median			*1.7*		*20.2*		*23.5*		*13.8*		*22.4*		*8.7*		*12.6*	*Jul-75*
Total International Equity	**7,103,535,168**	**21.1**	**1.0**	**34**	**16.3**	**55**	**12.9**	**67**	**5.2**	**70**	**15.2**	**75**	**6.3**	**86**	**6.5**	**Apr-87**
ASRS Custom Int'l Equity Benchmark			*0.8*	*40*	*16.8*	*52*	*13.4*	*65*	*5.4*	*61*	*16.5*	*56*	*7.5*	*66*	*6.2*	*Apr-87*
Over/Under			0.2		-0.5		-0.5		-0.2		-1.3		-1.2		0.3	
eA All ACWI ex-US Equity Net Median			*0.4*		*16.8*		*14.6*		*6.1*		*16.8*		*8.0*		*7.9*	*Apr-87*
Total Public Markets Fixed Income	**4,373,957,134**	**13.0**	**1.9**	**46**	**3.4**	**38**	**-0.3**	**83**	**4.3**	**48**	**6.1**	**49**	**4.9**	**38**	**8.5**	**Jul-75**
ASRS Custom Fixed Income Benchmark			*2.2*	*35*	*3.5*	*38*	*0.4*	*56*	*4.3*	*48*	*5.2*	*58*	*4.6*	*45*	--	*Jul-75*
Over/Under			-0.3		-0.1		-0.7		0.0		0.9		0.3		--	
eA All US Fixed Inc Net Median			*1.8*		*2.6*		*0.5*		*4.1*		*5.9*		*4.5*		*8.3*	*Jul-75*
Total Inflation-Linked Assets	**845,433,279**	**2.5**	**5.1**	**--**	**8.1**	**--**	**-1.3**	**--**	**-5.2**	**--**	**--**	**--**	**--**	**--**	**1.6**	**Feb-10**
ASRS Custom Inflation-Linked Benchmark			*7.0*	--	*8.1*	--	*-2.1*	--	*-6.9*	--	*1.4*	--	*2.8*	--	*0.0*	*Feb-10*
Over/Under			-1.9		0.0		0.8		1.7						1.6	
Total GTAA	**3,632,165,447**	**10.8**	**2.1**	**15**	**15.3**	**3**	**14.6**	**4**	**10.6**	**2**	**17.7**	**2**	**8.1**	**41**	**8.2**	**Jan-04**
ASRS Custom GTAA Benchmark			*1.8*	*19*	*13.5*	*12*	*13.6*	*11*	*9.7*	*6*	*15.4*	*12*	*6.5*	*64*	*6.6*	*Jan-04*
Over/Under			0.3		1.8		1.0		0.9		2.3		1.6		1.6	
eA Global TAA Net Median			*1.2*		*8.1*		*5.4*		*4.9*		*10.3*		*7.5*		*7.7*	*Jan-04*

[1]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 Alliance Universe.

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

Asset Class Performance Summary - Private Markets

	Market Value ($)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	Inception (%)	IRR (%)	Since
Total Fund	**33,695,874,285**	**100**	**2.3**	**13.8**	**9.6**	**10.0**	**--**	**Jul-75**
Interim SAA Policy			*2.4*	*13.9*	*9.5*	*9.8*	--	*Jul-75*
Over/Under			-0.1	-0.1	0.1	0.2	--	
Actual Benchmark			*2.5*	*14.8*	*9.7*	--	--	*Jul-75*
Total Private Equity	**1,962,038,935**	**5.8**	**5.2**	**15.0**	**15.4**	**3.9**	**12.9**	**Oct-07**
Russell 2000 1 QTR Lagged			*8.7*	*38.8*	*15.7*	*7.5*	*17.3*	*Oct-07*
Over/Under			-3.5	-23.8	-0.3	-3.6	-4.4	
Total Opportunistic Equity[1]	**279,127,091**	**0.8**	**27.9**	**43.5**	**--**	**25.1**	**40.7**	**Apr-11**
Total Private Debt	**853,164,094**	**2.5**	**4.1**	**17.8**	**--**	**17.3**	**17.2**	**Jul-12**
S&P/LSTA Leveraged Loan Index + 250 bps 1 QTR Lagged			*2.3*	*7.8*	*--*	*9.3*	*8.4*	*Jul-12*
Over/Under			1.8	10.0		8.0	8.8	
Total Opportunistic Debt[1]	**884,564,294**	**2.6**	**1.8**	**8.4**	**8.5**	**8.7**	**12.1**	**Jan-08**
Total Real Estate	**1,874,277,985**	**5.6**	**3.8**	**13.2**	**13.2**	**3.4**	**5.6**	**Oct-05**
NCREIF ODCE 1 QTR Lagged			*2.9*	*12.9*	*12.5*	*4.8*	*4.8*	*Oct-05*
Over/Under			0.9	0.3	0.7	-1.4	0.8	
Total Farmland and Timber	**80,323,879**	**0.2**	**3.9**	**--**	**--**	**-46.6**	**1.1**	**Jul-13**
CPI ex-Food and Energy + 350 bps 1 QTR Lagged			*1.3*	*--*	*--*	*2.6*	*1.2*	*Jul-13*
Over/Under			2.6			-49.2	-0.1	

[1]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 Credit Suisse Fund Group.

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.

Public Market Asset Class Analysis

3 Years Ending March 31, 2014

	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Rank	Info Ratio	Rank	Sharpe Ratio	Rank	Beta	Rank	Anlzd Alpha
Total Fund	9.6%	22	8.9%	81	1.1%	48	0.2	57	1.1	53	1.0	26	0.3%
Interim SAA Policy	9.5%	28	9.0%	81	--	--	--	--	1.0	58	--	--	--
Total Domestic and International Equity	11.2%	--	13.9%	--	0.6%	--	-0.4	--	0.8	--	1.0	--	-0.2%
ASRS Custom Total Equity Benchmark	11.5%	--	14.0%	--	--	--	--	--	0.8	--	--	--	--
Total Domestic Equity	14.3%	42	13.4%	32	0.5%	1	-0.7	82	1.1	33	1.0	39	-0.5%
ASRS Custom Domestic Equity Benchmark	14.7%	36	13.3%	29	--	--	--	--	1.1	27	--	--	--
Total International Equity	5.2%	70	16.4%	40	0.8%	1	-0.3	86	0.3	66	1.0	48	-0.1%
ASRS Custom Int'l Equity Benchmark	5.4%	61	16.8%	52	--	--	--	--	0.3	64	--	--	--
Total Public Markets Fixed Income	4.3%	48	3.6%	66	0.5%	1	0.1	44	1.2	79	1.1	86	-0.3%
ASRS Custom Public Markets Fixed Income Benchmark	4.3%	48	3.3%	62	--	--	--	--	1.3	71	--	--	--
Total Inflation-Linked Assets	-5.2%	--	14.6%	--	2.3%	--	0.7	--	-0.4	--	1.0	--	1.5%
ASRS Custom Inflation-Linked Benchmark	-6.9%	--	15.1%	--	--	--	--	--	-0.5	--	--	--	--
Total GTAA	10.6%	2	9.6%	72	1.8%	6	0.5	2	1.1	22	1.0	76	0.7%
ASRS Custom GTAA Benchmark	9.7%	6	9.3%	63	--	--	--	--	1.0	24	--	--	--

Note: Performance is reported net of fees.

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 Alliance Universe.

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

Public Market Asset Class Analysis

5 Years Ending March 31, 2014

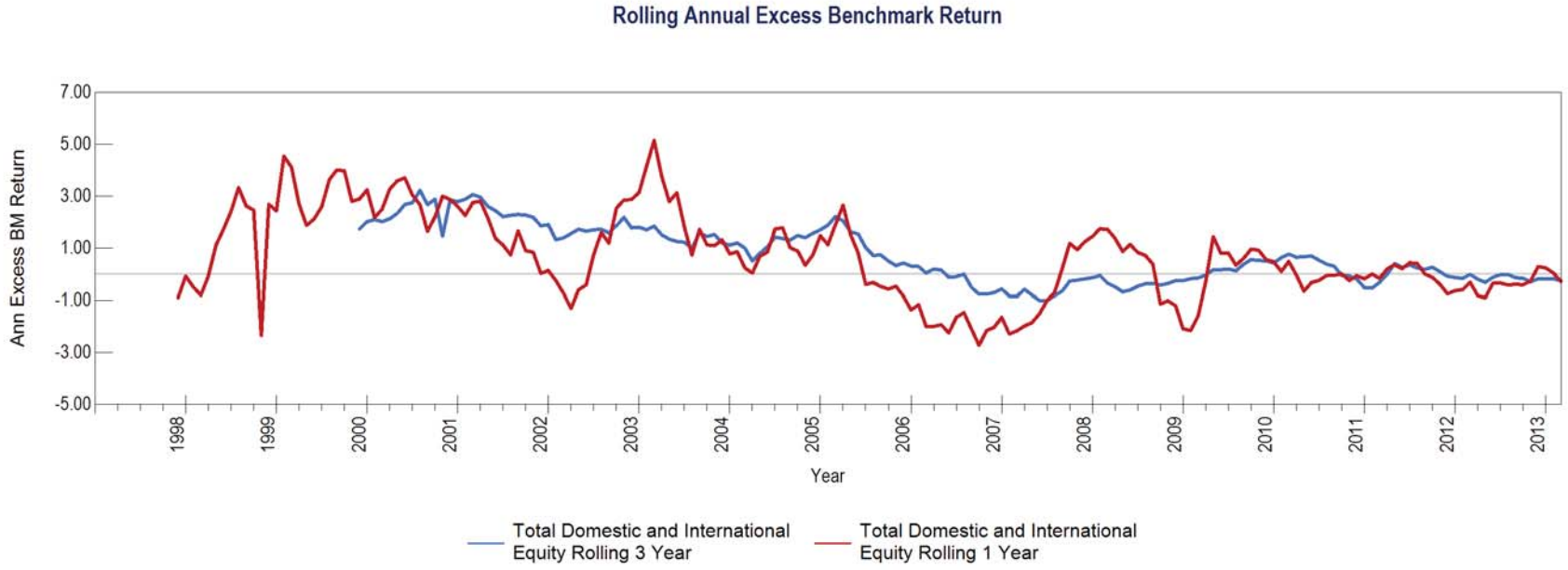
	Anlzd Ret	Rank	Anlzd Std Dev	Rank	Tracking Error	Rank	Info Ratio	Rank	Sharpe Ratio	Rank	Beta	Rank	Anlzd Alpha
Total Fund	15.9%	12	10.1%	83	1.1%	20	0.3	60	1.6	66	1.0	40	0.6%
Interim SAA Policy	15.7%	17	10.3%	84	--	--	--	--	1.5	77	--	--	--
Total Domestic and International Equity	20.0%	--	15.3%	--	0.9%	--	-0.4	--	1.3	--	1.0	--	0.1%
ASRS Custom Total Equity Benchmark	20.3%	--	15.6%	--	--	--	--	--	1.3	--	--	--	--
Total Domestic Equity	22.5%	49	14.9%	33	0.5%	1	0.2	36	1.5	27	1.0	42	0.0%
ASRS Custom Domestic Equity Benchmark	22.4%	50	14.8%	31	--	--	--	--	1.5	26	--	--	--
Total International Equity	15.2%	75	17.9%	39	1.5%	1	-0.9	99	0.8	71	1.0	48	-0.6%
ASRS Custom Int'l Equity Benchmark	16.5%	56	18.7%	57	--	--	--	--	0.9	60	--	--	--
Total Public Markets Fixed Income	6.1%	49	3.4%	57	0.9%	1	1.1	31	1.8	65	1.0	87	0.8%
ASRS Custom Public Markets Fixed Income Benchmark	5.2%	58	3.1%	52	--	--	--	--	1.6	74	--	--	--
Total Inflation-Linked Assets	--	--	--	--	--	--	--	--	--	--	--	--	--
ASRS Custom Inflation-Linked Benchmark	1.4%	--	12.8%	--	--	--	--	--	0.1	--	--	--	--
Total GTAA	17.7%	2	10.7%	79	2.0%	9	1.2	1	1.6	9	1.0	80	2.2%
ASRS Custom GTAA Benchmark	15.4%	12	10.5%	76	--	--	--	--	1.5	42	--	--	--

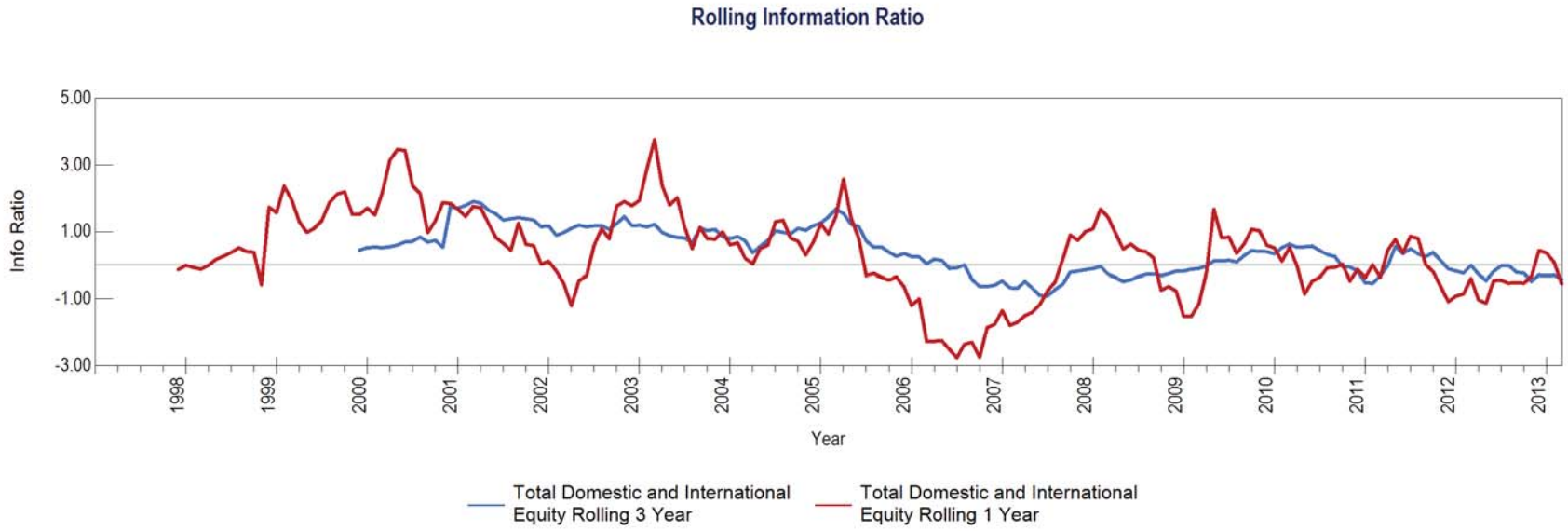
Note: Performance is reported net of fees.

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 Alliance Universe.

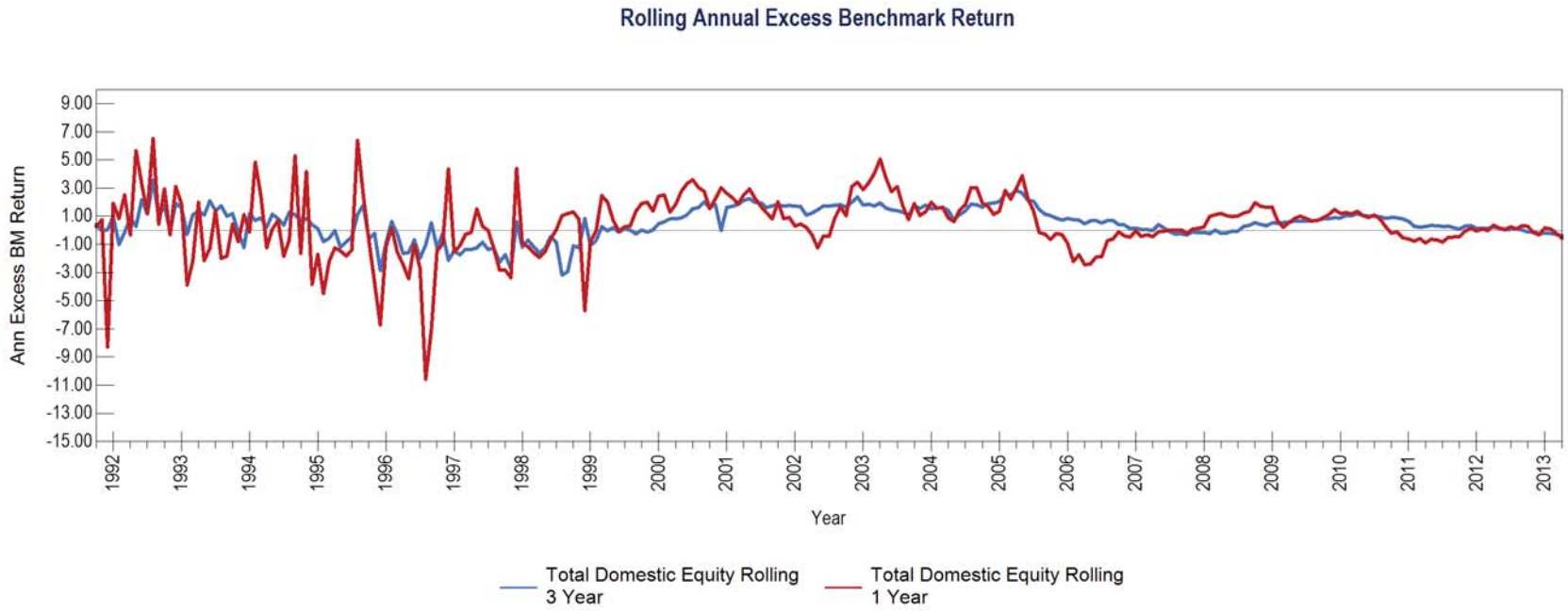
Composition of Interim SAA Policy and ASRS Custom Benchmarks can be found in the appendix.

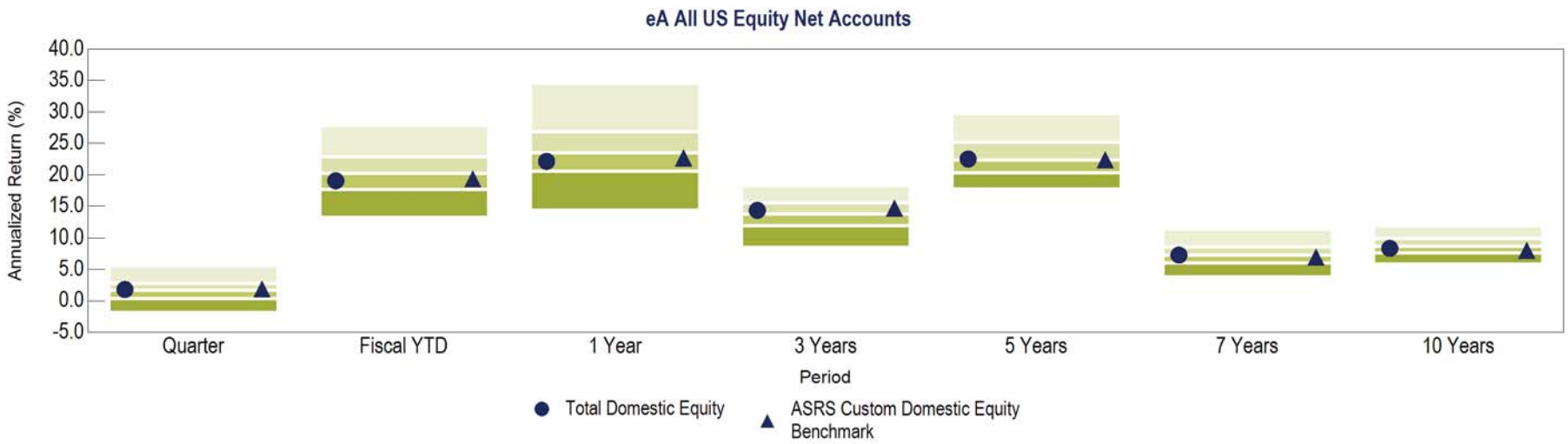
Asset Class Analysis - Total Domestic and International Equity



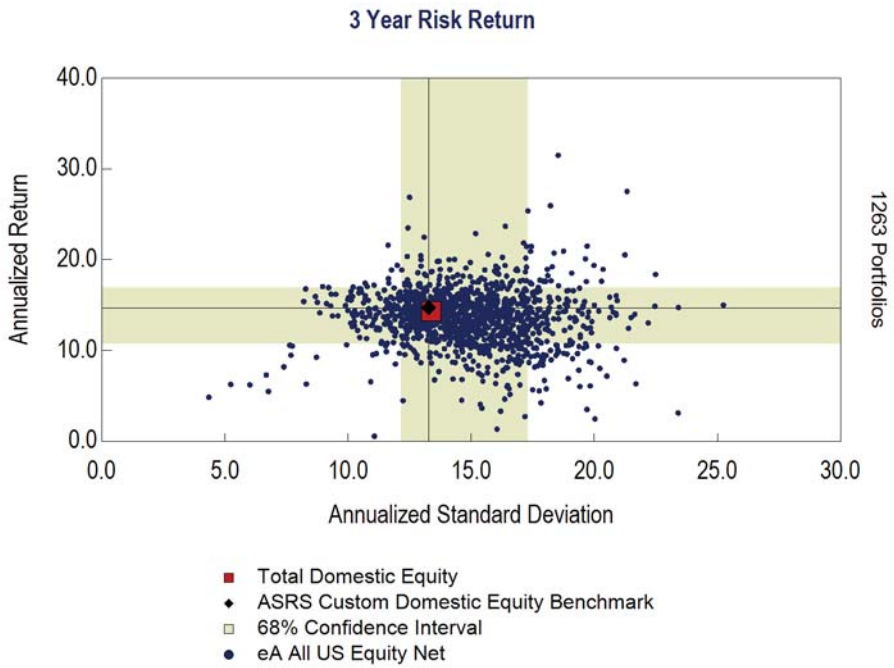


Asset Class Analysis - Total Domestic Equity





Asset Class Analysis - Total Domestic Equity



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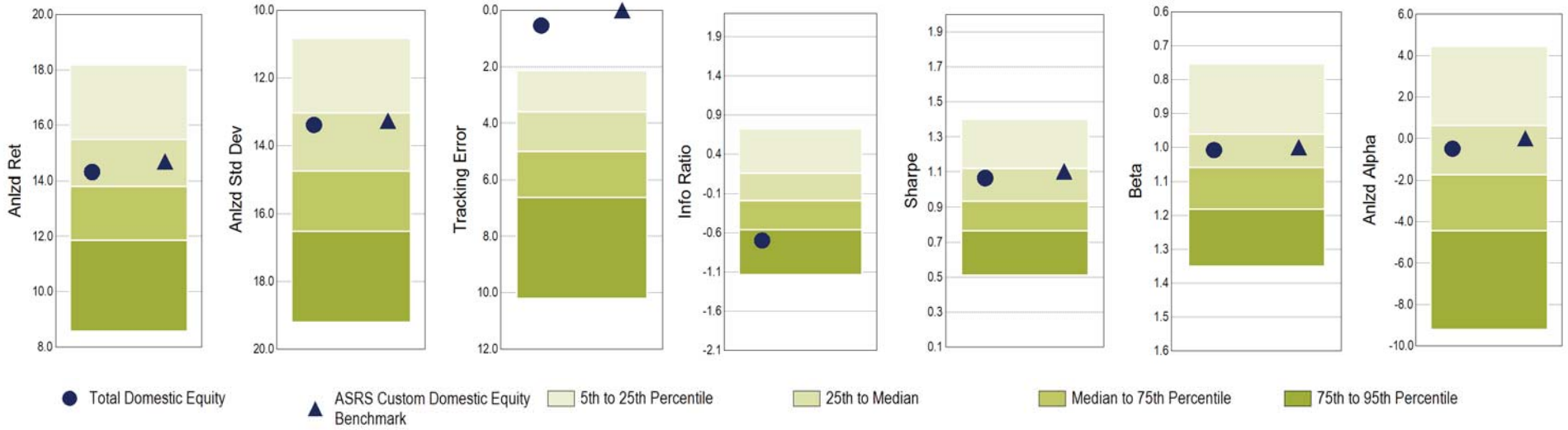
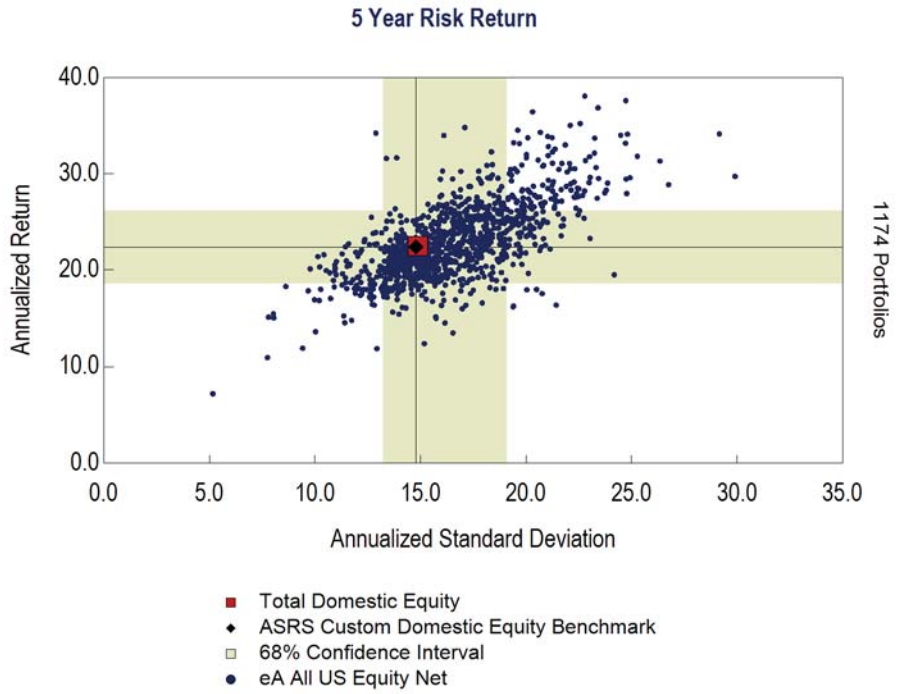
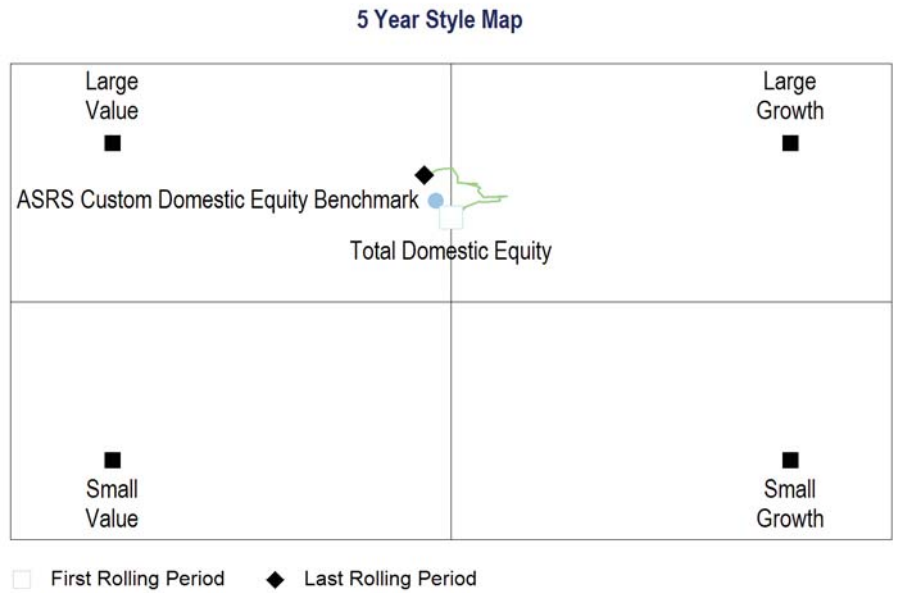


Asset Class Analysis - Total Domestic Equity





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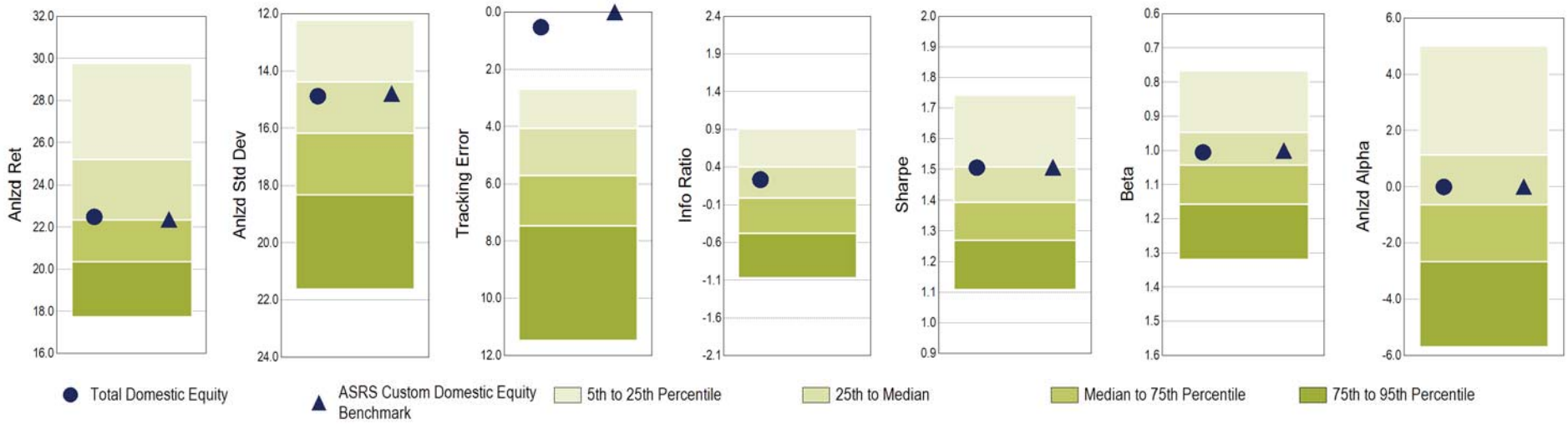
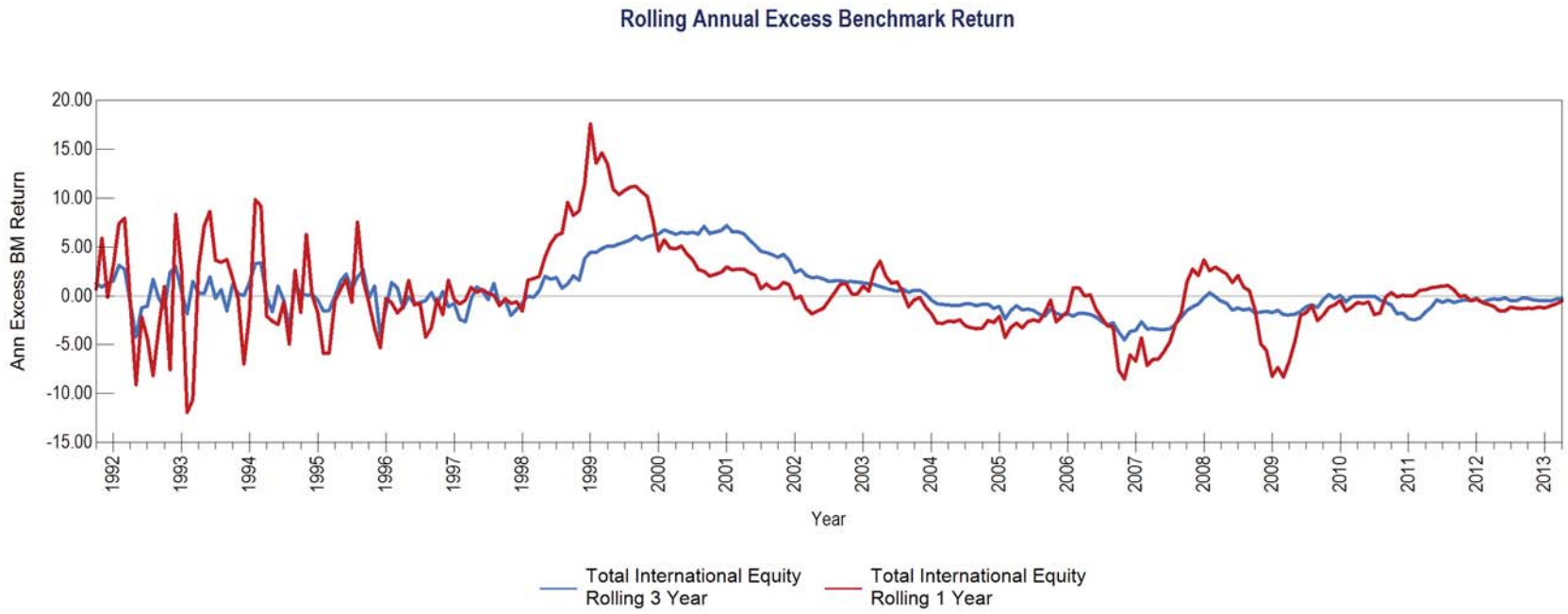
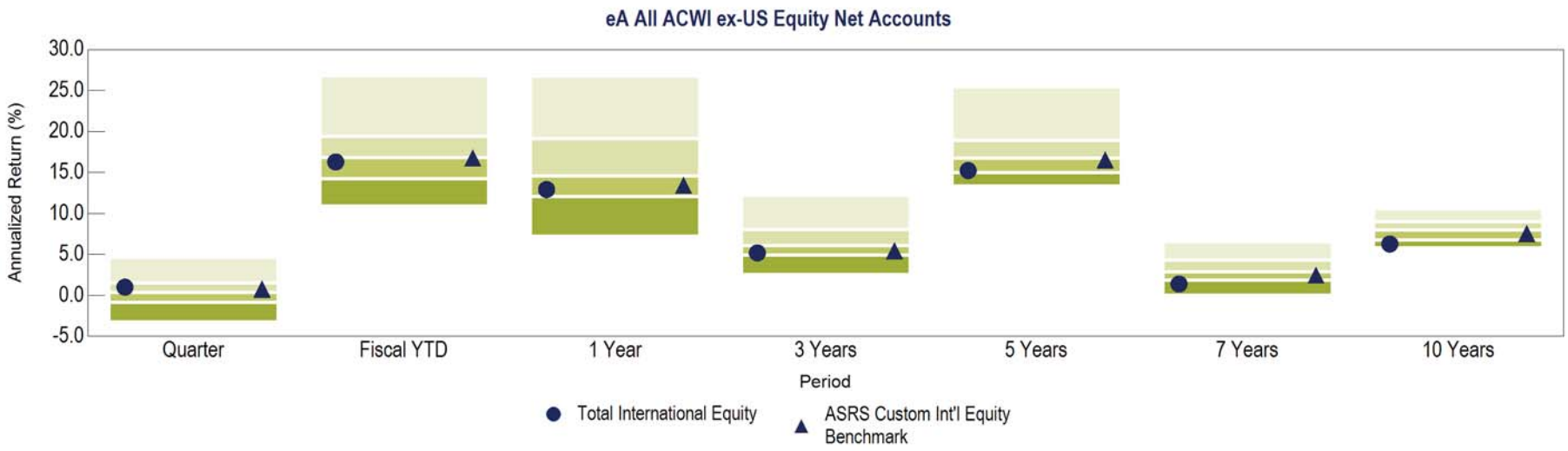
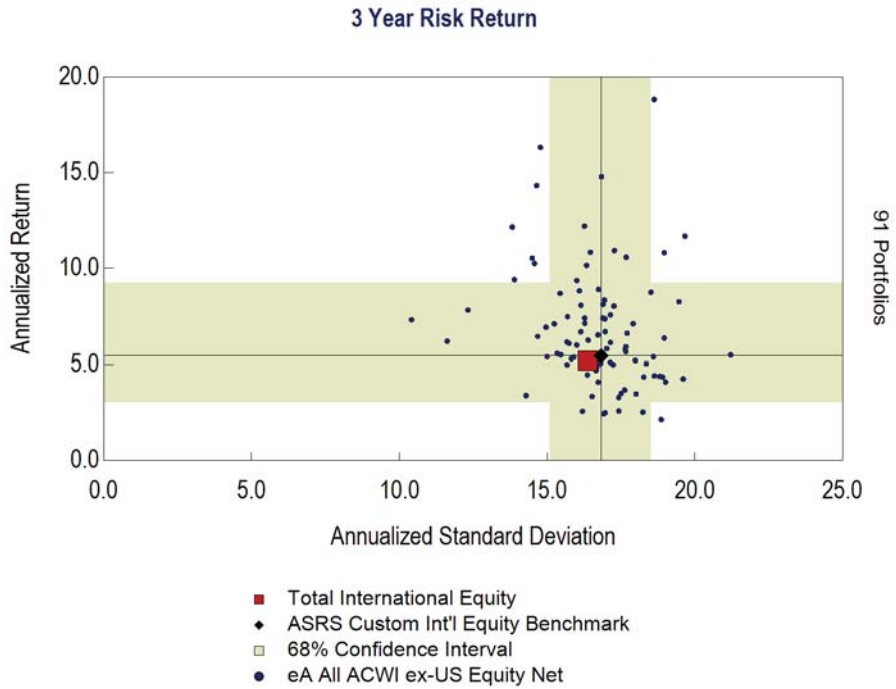


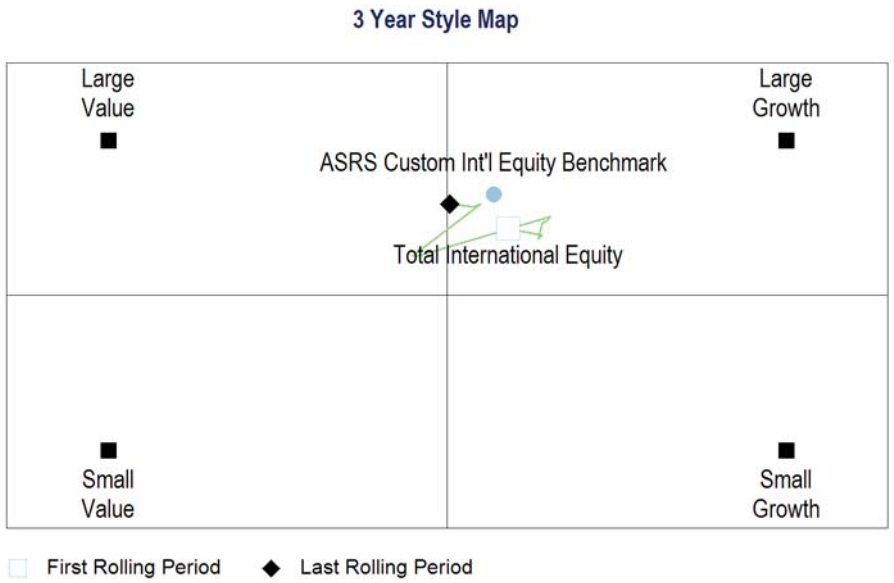
Asset Class Analysis - Total International Equity





Asset Class Analysis - Total International Equity





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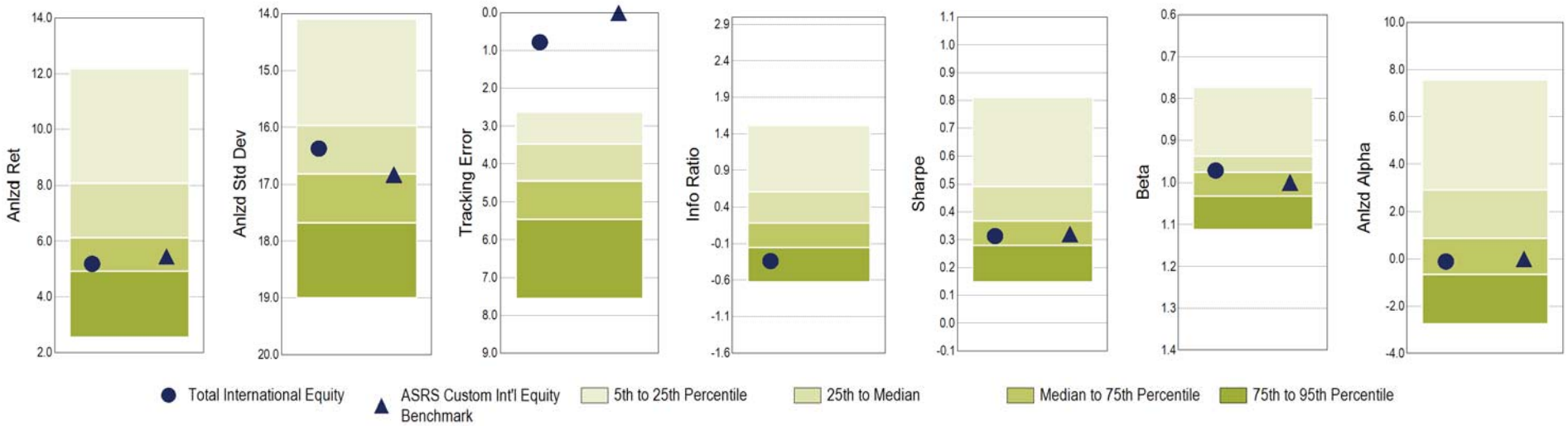
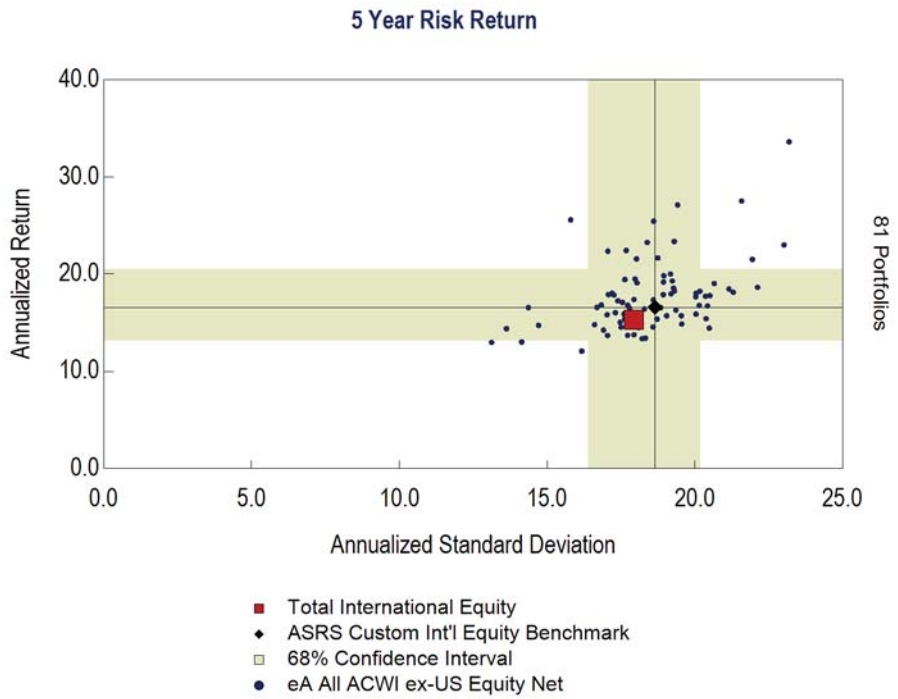
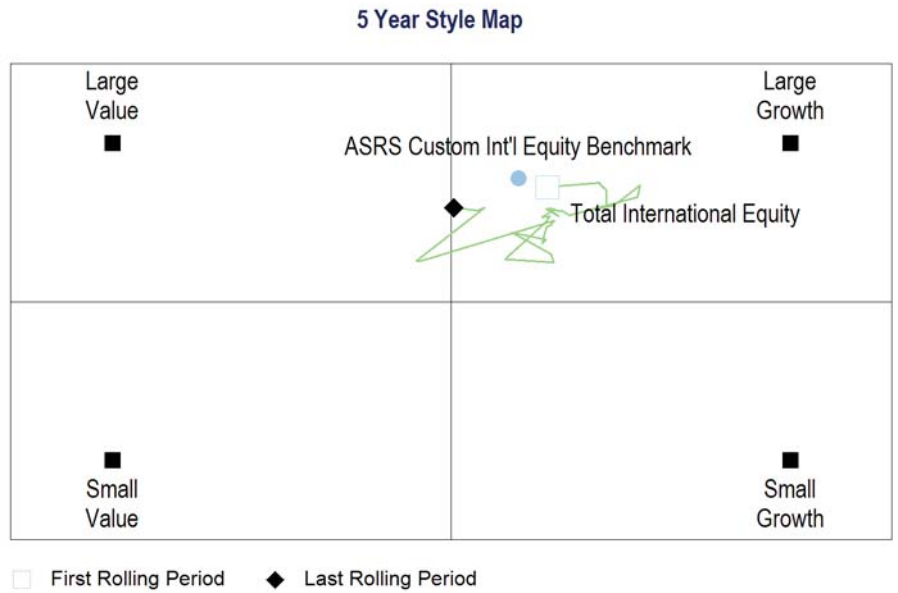


Asset Class Analysis - Total International Equity





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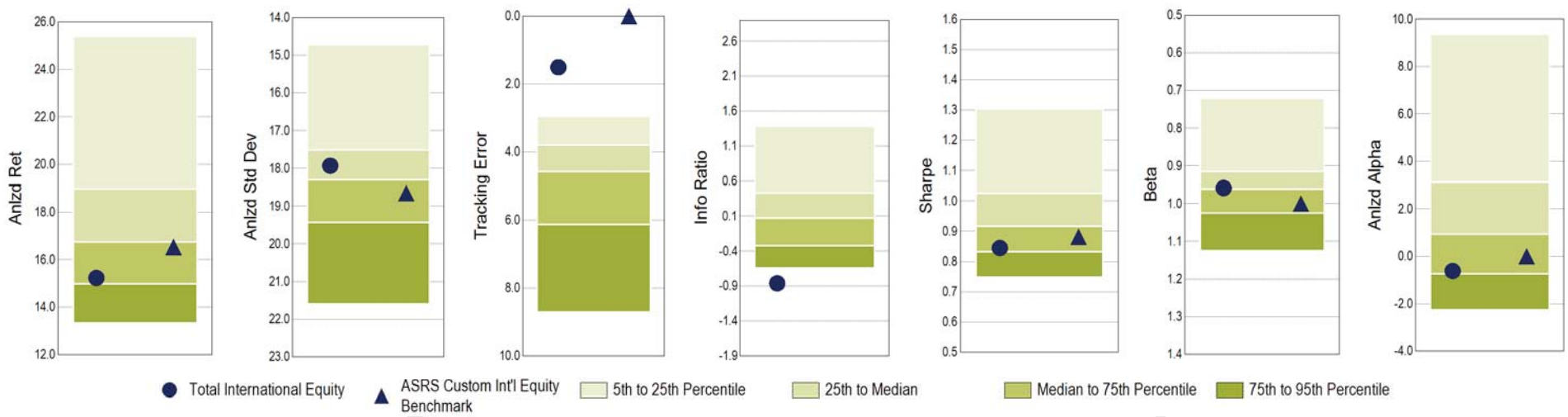
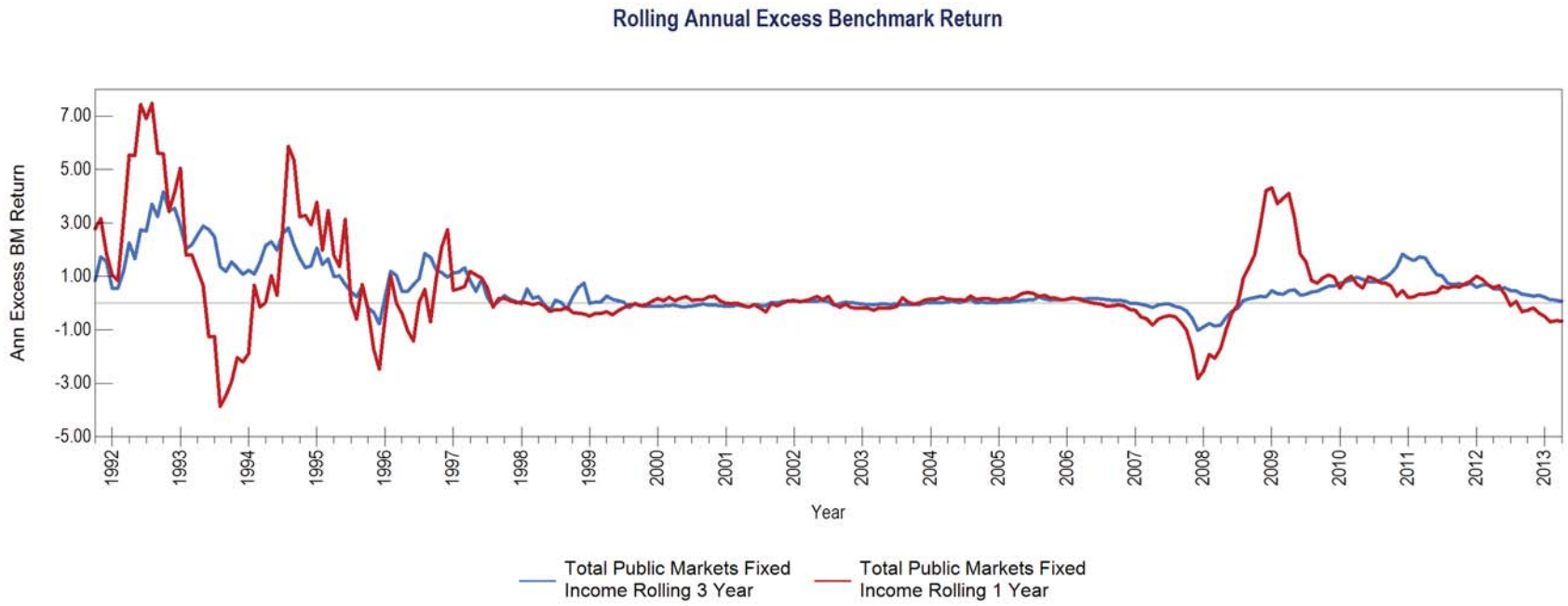
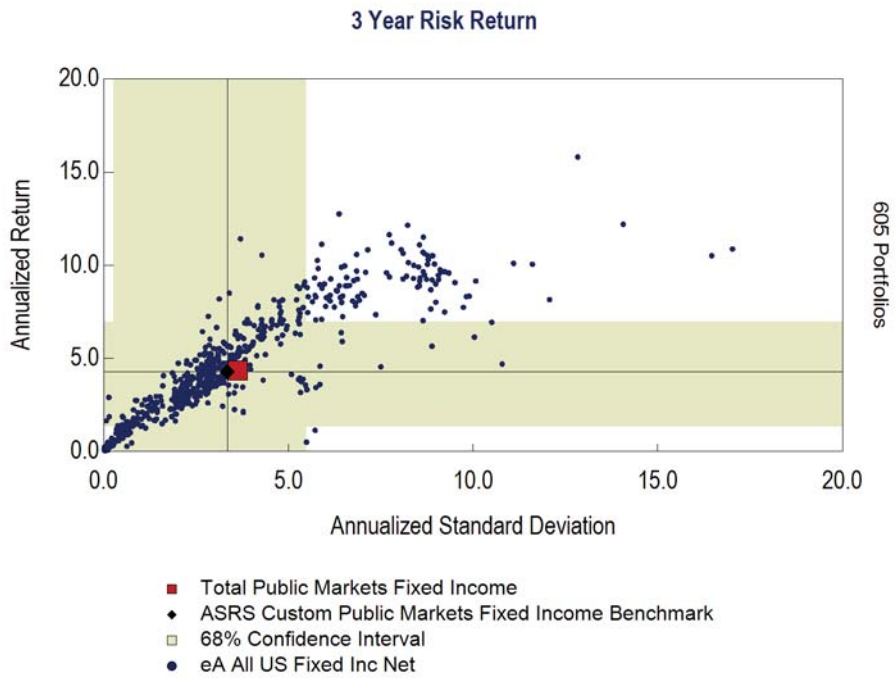
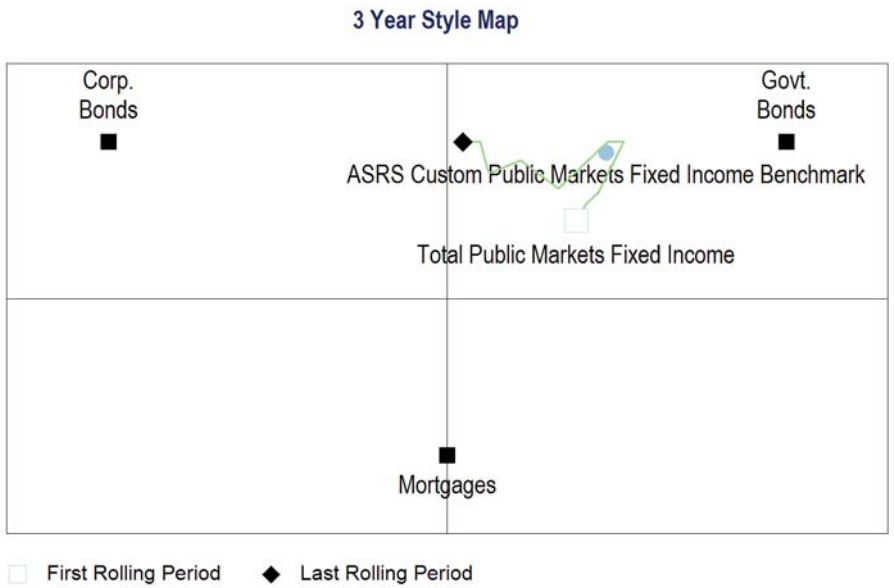


Asset Class Analysis - Total Public Markets Fixed Income



Asset Class Analysis - Total Public Markets Fixed Income





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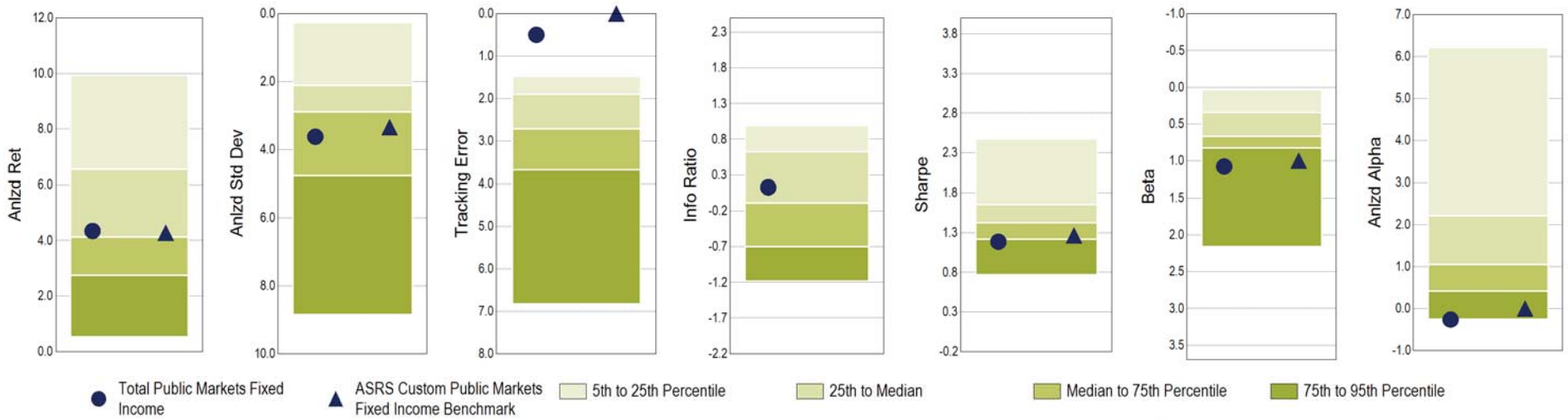
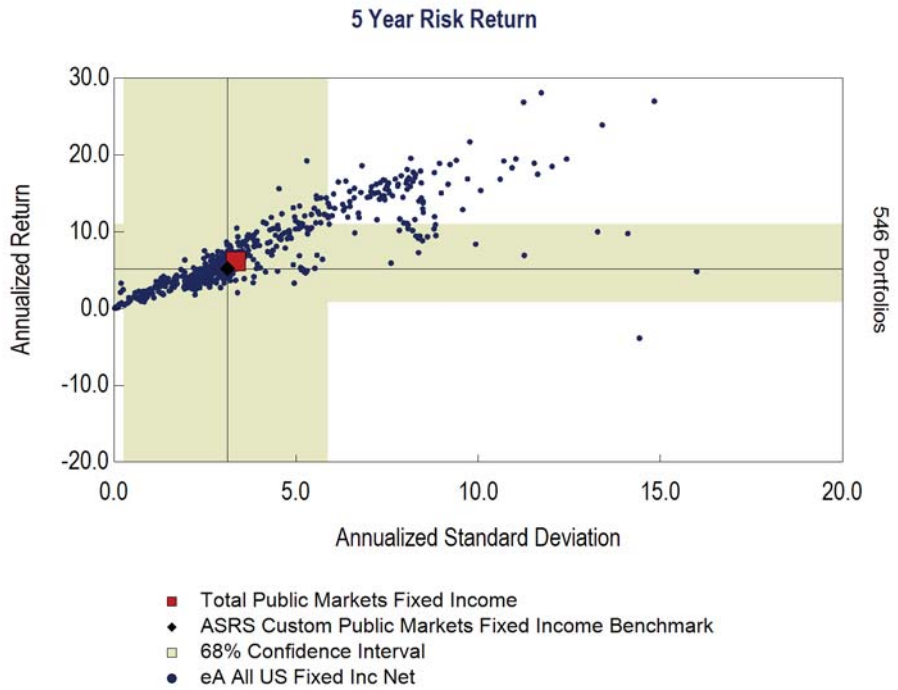
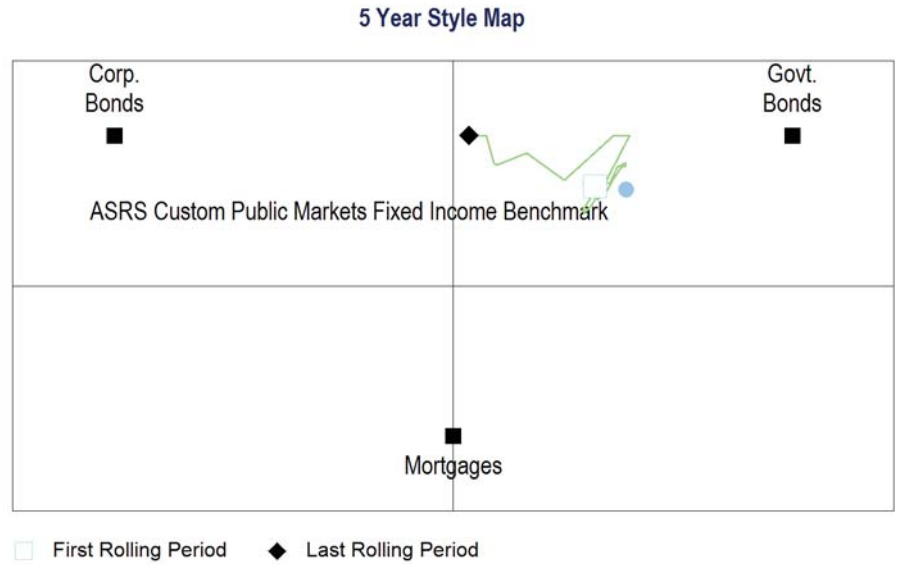


Asset Class Analysis - Total Public Markets Fixed Income





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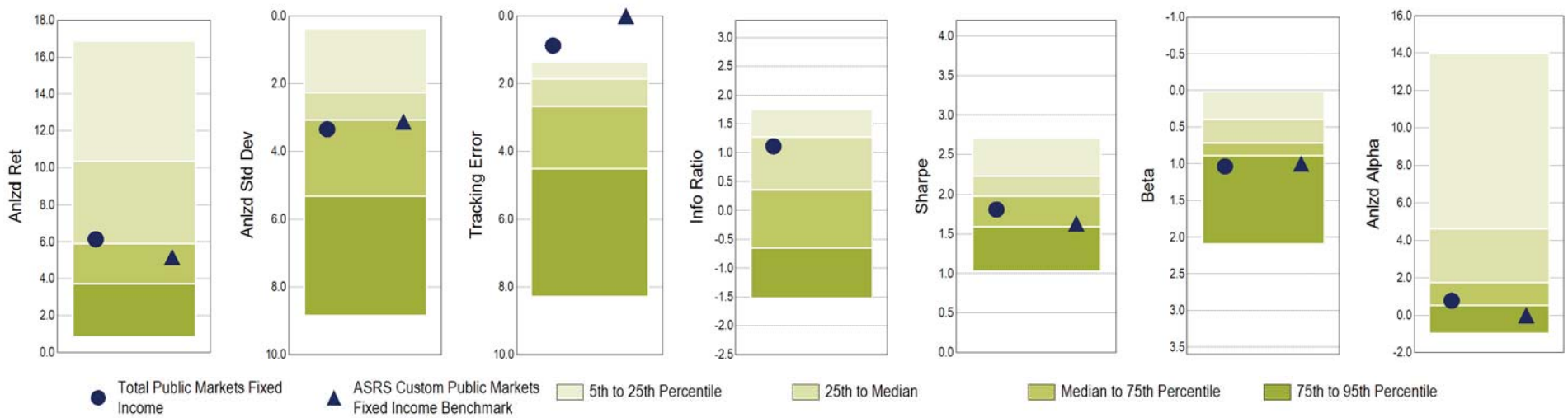
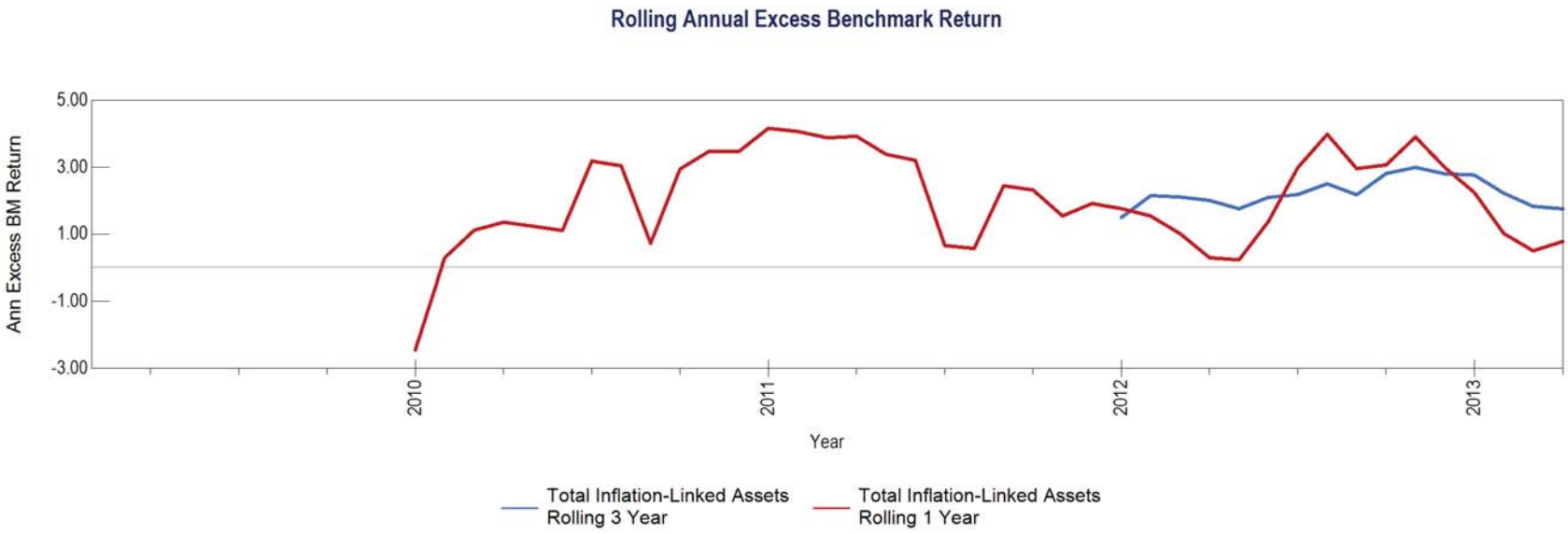
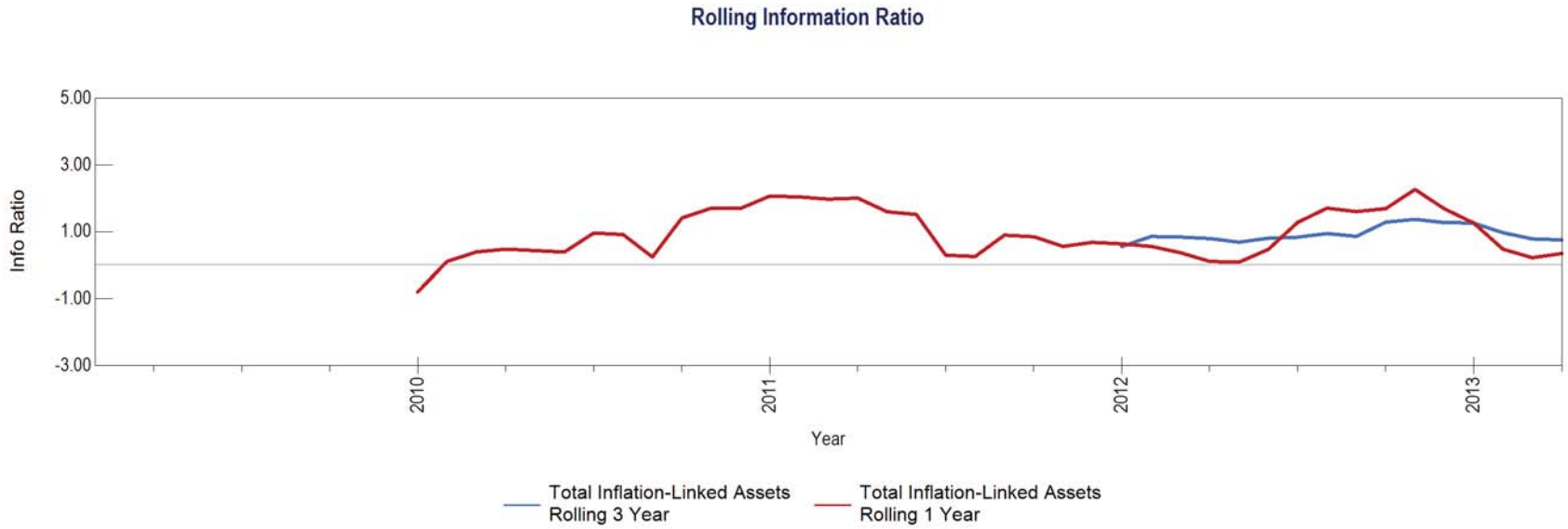
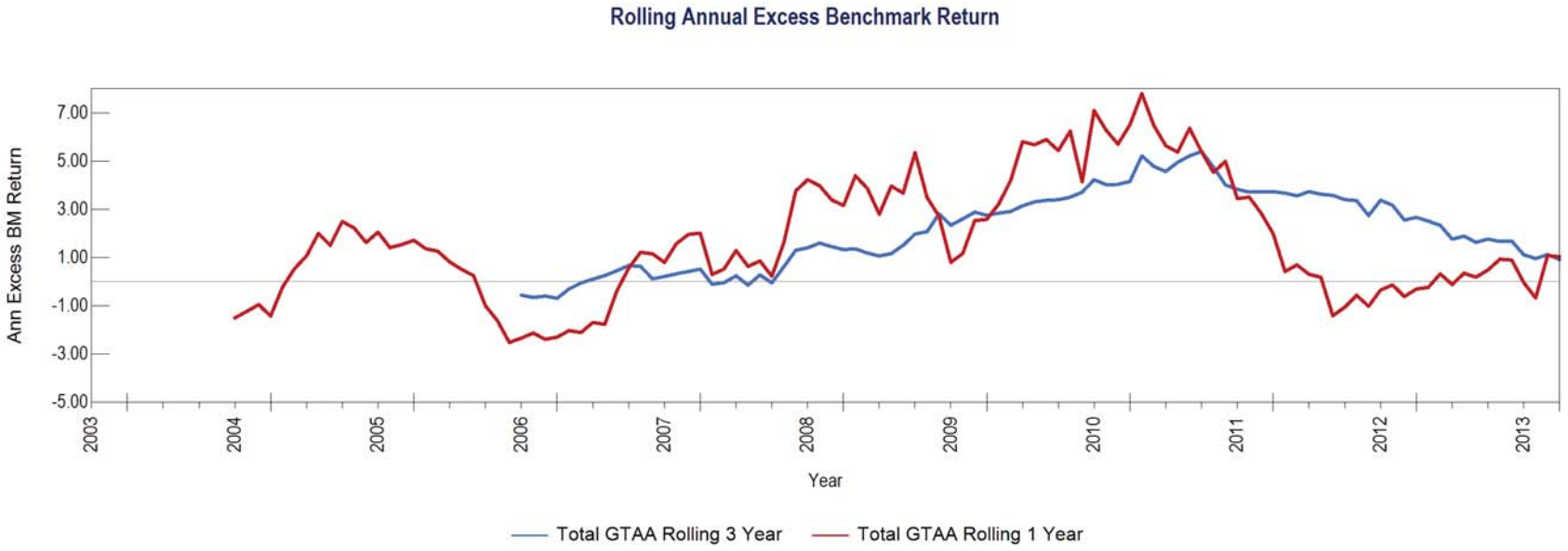


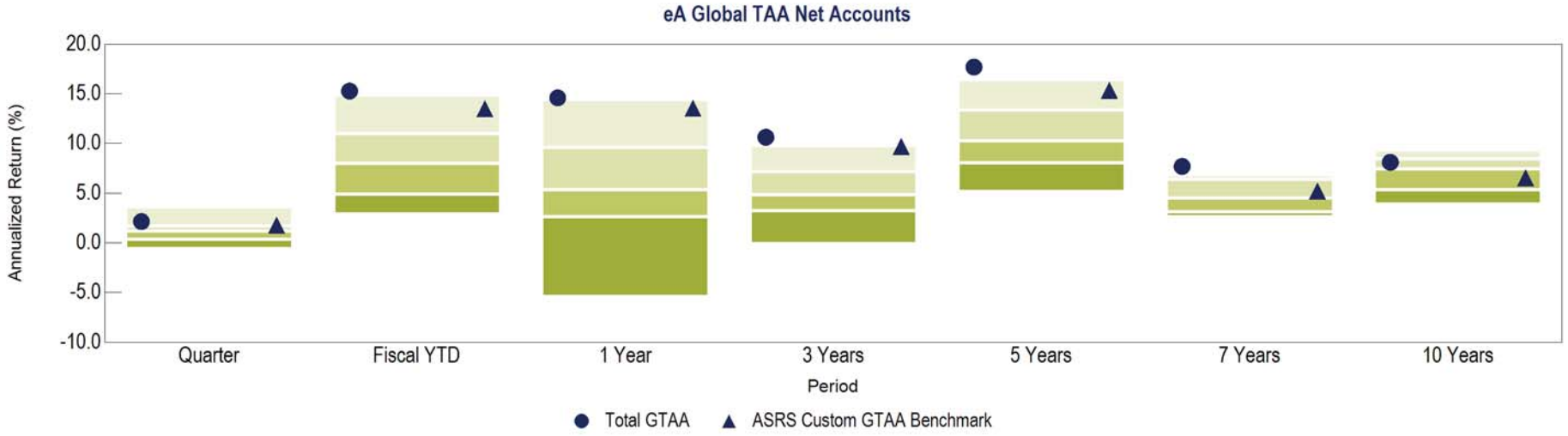
Asset Class Analysis - Total Inflation-Linked Assets



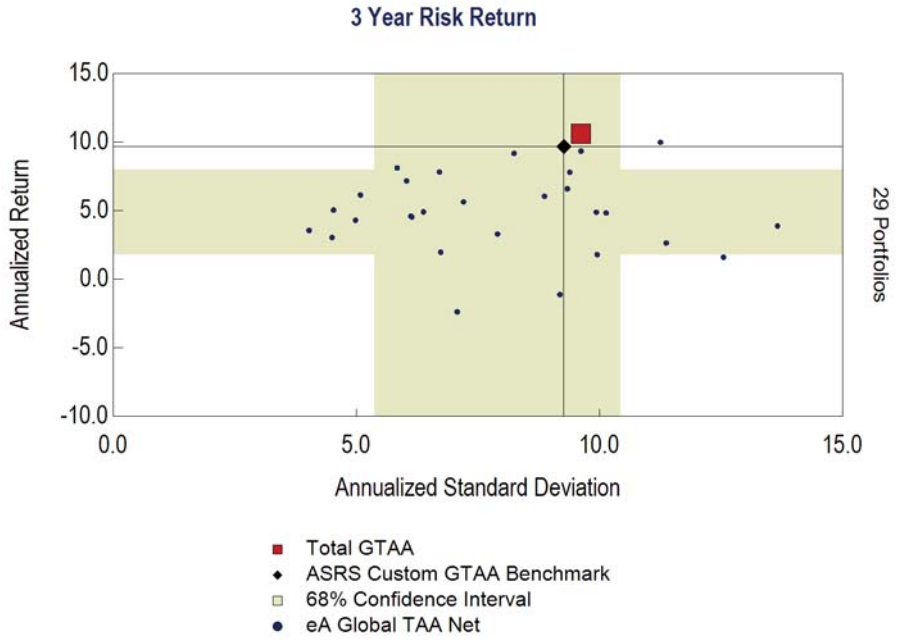


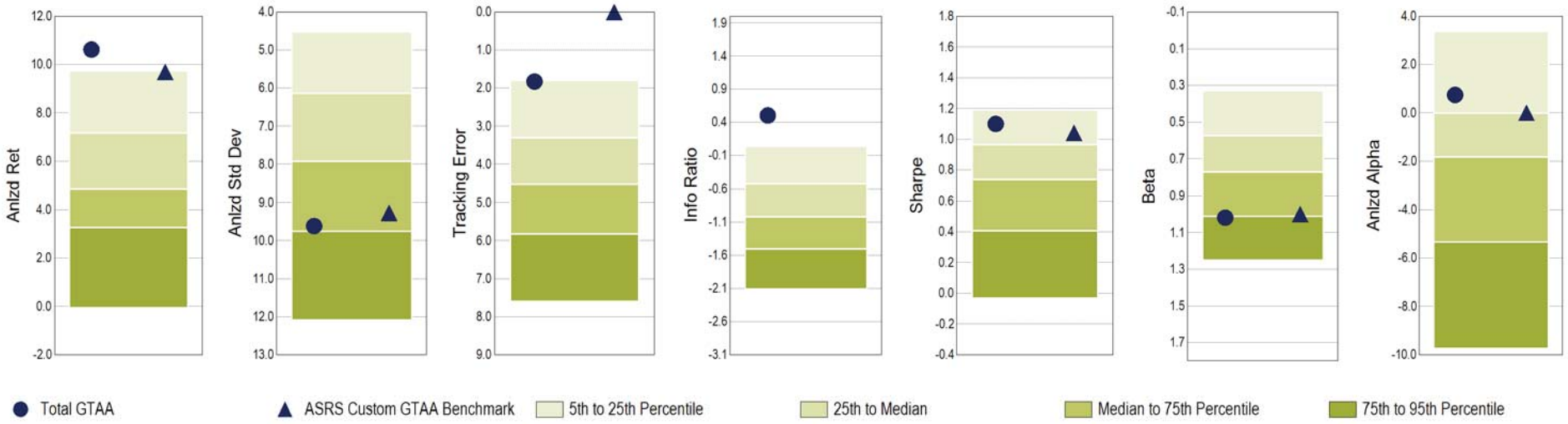
Asset Class Analysis - Total GTAA



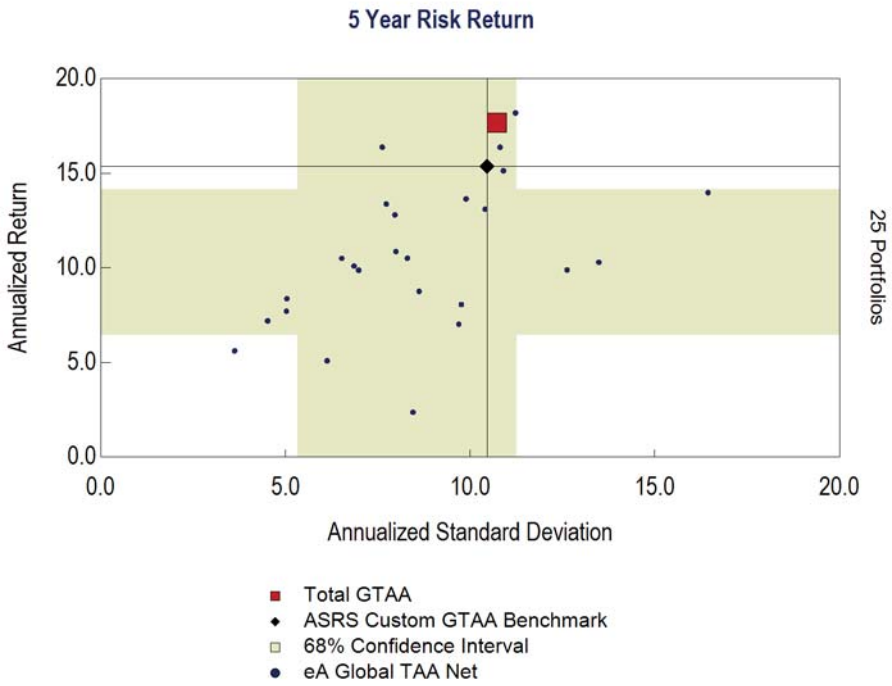


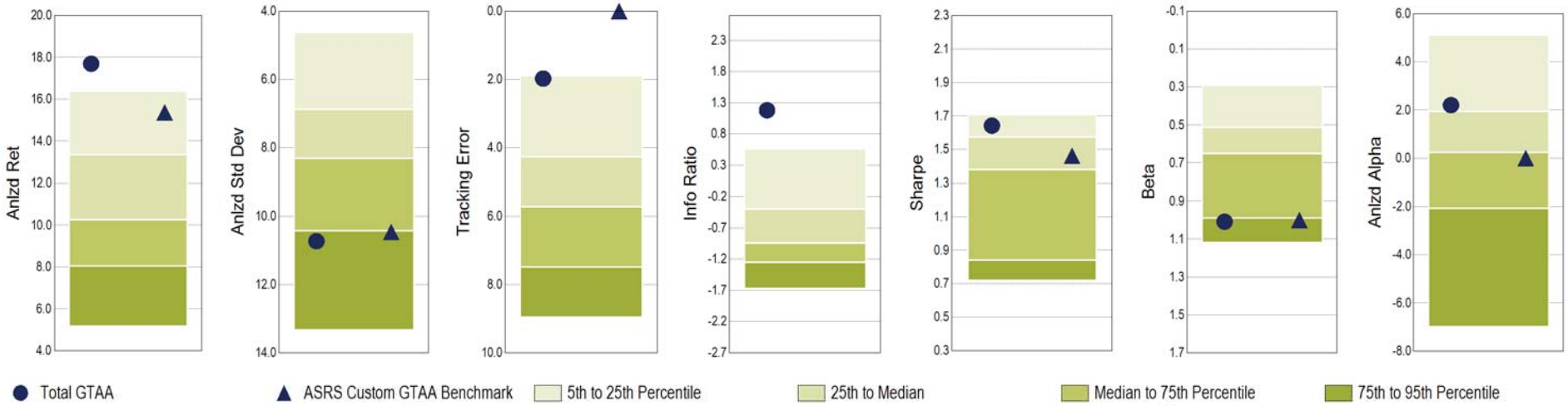
Asset Class Analysis - Total GTAA





Asset Class Analysis - Total GTAA





Asset Class Committee Monitoring

- **Eight Asset Class Committee meetings have been held since the last time we provided an update on the ASRS Asset Class Committee Meetings.**

- **February 21, 2014 – Private Markets Committee**
  - Review of Private Markets Program Staff Report
  - General Discussion on Future Agenda Items and Deal Flow
  - Private Equity Manager Recommendation ($75 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%)
    - The ASRS has invested with this manager in a prior fund and has also approved co-investment with this manager and is in the process of finalizing the legal documents to begin co-investing.
    - Due diligence process was followed in accordance with SIP006 – 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 7%)
    - The ASRS has 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.

Asset Class Committee Monitoring

- **February 21, 2014 – Private Markets Committee (continued)**
  - Niche and Tactical Real Estate Discussion
    - The Committee previously approved a $350 million program of niche and tactical real estate investments and authorized RCLCO, the Plan's real estate advisor, to develop a detailed plan for implementation and a preliminary pipeline.
    - The Committee authorized the ASRS private markets team and RCLCO to proceed with implementation of the niche and tactical real estate program over what is estimated to be a two year period.
      - There is no requirement to invest the entire $350 million.
      - Investments will be approved in a two-step process by the PRIVMC, first as a preliminary presentation and second, if further work is authorized, as a final, more detailed presentation.
      - Several specific investment criteria were established, subject to modifications, including expected return targets, minimum size of investments, location of investments (all U.S.), use of leverage (65% max), the structure of the investments and additional partners.
      - A financial reporting and monitoring process will be established.
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 8%)
  - Residential Land Discussion
    - The 2014 real estate pacing and implementation plan included a recommendation from RCLCO for the ASRS to consider investments in residential land as an opportunistic equity investment.
      - The recommendation was not approved, but the Committee authorized RCLCO to perform additional work on the topic to provide a more detailed explanation of the market opportunity.
    - The Committee authorized the ASRS private markets team and RCLCO to proceed with implementation of the residential land strategy to invest $100 million.
      - There is no requirement to invest the entire $100 million. Program is designed to return all capital within three years.
      - Investments will be approved in a two-step process by the PRIVMC, first as a preliminary presentation and second, if further work is authorized, as a final, more detailed presentation.
      - Several specific investment criteria were established, subject to modifications, including expected return targets, minimum size of investments, location of investments (all U.S.) and geographic diversification, use of leverage (50% max for any one property; 30% max at the portfolio level), the structure of the investments and additional partners.
      - A financial reporting and monitoring process will be established.
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Opportunistic Equity is 0% with a range of 0-3%)

Asset Class Committee Monitoring

- **March 24, 2014 – Private Markets Committee**
  - Review of Private Markets Program Staff Report
  - General Discussion on Future Agenda Items and Deal Flow
  - Private Equity Manager Recommendation ($75 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%)
    - Due diligence process was followed in accordance with SIP006 – 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 7%)
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.

- **March 27, 2014 – Public Markets Committee**
  - Review of Public Equity Program Staff Report
  - Non-U.S. Developed Markets Large Cap Equity Re-Structure and Manager Recommendation ($1.0 billion)
    - Staff recommended the termination of three non-U.S. developed markets large cap equity managers and to transition those assets to three new managers, with a residual amount ($5 million) allocated to the remaining active manager (Brandes).
      - New managers are growth ($525 million), concentrated core ($350 million) and value ($155 million) strategies to complement the existing value portfolio managed by Brandes ($523 million).
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Int'l Dev. Mkts Large Cap is 14%)
    - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.

Asset Class Committee Monitoring

- **April 17, 2014 – Public Markets Committee**
  - Committee approved termination of active core fixed income mandate managed by PIMCO.
    - Portfolio Manager responsible for ASRS portfolio left PIMCO during the first quarter.
    - BlackRock US Debt mandate reengaged to manage the assets going forward.
  - Committee approved termination of active high yield fixed income mandate managed by Shenkman.
    - This results in a 1.5% underweight to high yield fixed income vs. SAAP.
    - IMD currently favors opportunistic and private debt mandates over high yield fixed income.
  - Emerging Markets Discussion
    - With regard to emerging market debt, IMD expressed concerns with volatility levels in the asset class, noting that currency volatility has significantly detracted from performance and is larger than anticipated.
    - Currency volatility is a concern regardless of whether it has a positive or negative impact.
    - IMD is currently underweight emerging market debt vs. SAAP (2.7% vs. 4% SAAP target)
    - Within equities, each of the ASRS active emerging market equity managers are outperforming the benchmark since inception and volatility has stabilized; however, significant outflows from emerging market equities has negatively impacted performance.

- **April 22, 2014 – Private Markets Committee**
  - Review of Private Markets Program Staff Report
  - General Discussion on Future Agenda Items and Deal Flow
    - Update on the status of back office provider search.
    - Discussion of 'covenant light' lending and impact on ASRS private debt allocation.
    - Private Equity benchmarking was discussed but no action was taken.
    - Update on residential land strategy search.
  - Private Equity Manager Recommendation ($40 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%).
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.

Asset Class Committee Monitoring

- **May 12, 2014 – Ad Hoc Private Markets Committee**
  - Opportunistic Equity Manager Recommendation($100 million)
    - Separately managed portfolio to invest in residential land pursuant to 2/21/2014 PRIVMC meeting discussion. There is no requirement that the entire $100 million be invested.
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Opportunistic Equity is 0% with a range of 0-3%; Aggregate Opportunistic asset classes not to exceed 10%).
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.

- **May 27, 2014 – Private Markets Committee**
  - Review of Private Markets Program Staff Report
  - General Discussion on Future Agenda Items and Deal Flow
    - $600 million in commitments targeted for 2014.
  - Private Equity Manager Recommendation ($40 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%).
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.
  - Private Equity Manager Recommendation ($25 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%).
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.

Asset Class Committee Monitoring

- **May 28, 2014 – Private Markets Committee**
  - Niche and Tactical Real Estate Discussion
    - At the 2/21/2014 PRIVMC meeting, the Committee approved the pursuit of niche and tactical investments in the real estate asset class in accordance with a documented procedure that includes approval by the Committee before conducting a full due diligence review.
    - IMD presented five potential investments and the Committee authorized further due diligence on each.

General Observations

- **The Fund continues to make significant progress moving the portfolio from the Interim SAAP toward the long-term SAAP.**
  - Full implementation results in a further reduction of 2% within U.S. Equities and 2% within U.S. Core Fixed Income and an increase of 1% to Private Equity, 1% to Private Debt, and 2% to Real Estate.

- **Strong absolute and relative Total Fund performance driven largely by the Fund's exposure to global equities.**
  - The Fund's volatility ranks in the bottom quartile of its peer group over all time periods reported herein due to its overweight to equities relative to peers. However, risk-adjusted measures of performance show the Fund is generating more return per unit of risk taken than approximately half of its peers over all time periods reported and more than one third of its peers over the three-year period.
  - Continued build-out of private debt and opportunistic debt asset classes provides an opportunity to generate equity-like returns with less volatility.

- **Restructuring of non-U.S. developed markets large cap equity allocation eliminates three underperforming actively managed strategies and replaces them with three new actively managed strategies.**
  - Goal of smoothing the volatility and return profile of the Fund's allocation to non-U.S. developed markets equities as the existing managers had experienced unusually large tracking error and poor relative performance over the short to intermediate term, which negated all of the value add that had been added relative to respective benchmarks since their inception.

- **Emerging markets, both equities and debt, have significantly trailed developed markets over the past year.**
  - We continue to advise clients to gain exposure to emerging markets through both debt and equity based on our belief in the long-term growth prospects of emerging markets countries relative to developed markets.
  - Critical to recognize that higher return expectations come with higher levels of volatility.
  - Individual emerging market countries are likely to behave in a more idiosyncratic fashion going forward.
  - A top-down active manager could potentially alleviate some of the macro challenges.
  - Current valuations present a compelling entry point or potential opportunity to add to allocations.

General Observations

- **$355 million in commitments to Private Equity strategies in line with strategic plan and pacing model for the asset class.**

- **$100 million commitment to Opportunistic Equity strategy increases total commitments to Opportunistic asset classes to $1.8 billion, or approximately 5.5% of the Total Fund. Aggregate Opportunistic asset classes not to exceed 10% per the SAAP.**
  - Total $435 million in commitments to Opportunistic Equity strategies = 1.3% of the Total Fund (SAAP Target to Opportunistic Equity is 0% with a range of 0-3%).
  - Total $1.4 billion in commitments to Opportunistic Debt strategies = 4.2% of the Total Fund (SAAP Target to Opportunistic Debt is 0% with a range of 0-10%).
  - Current actual exposure to Opportunistic investments is 3.4% of the Total Fund, which is largely comprised of investments in Opportunistic Debt strategies.

- **Tactical positioning consistent with IMD House Views**

Market Environment Update and Outlook

Economic Environment

- **First quarter GDP growth was slower at 0.1% principally due to severe winter weather. Potential for second quarter rebound in growth?**
  - Retail sales (ended March) rose to 2.2% on a year-over-year growth rate basis.
  - The inventory-to-sales ratio has remained mostly flat since early 2010 and closed at 1.31% in February.
  - Corporate profits as a percent of GDP remained near secular highs at 12.7% at the end of Q4 2013.
  - The trade deficit increased in February.

- **The unemployment rate stayed flat at 6.7% in March; U-6, a broader measure of unemployment, rose to 12.7% during the first quarter.**
  - JP Morgan has stated that sustained GDP growth of 1.5% is needed for positive job creation, and closer to 3% growth is needed to decrease the unemployment rate.

- **Consumer confidence fell to 82.3 in March; the Case-Schiller Home Price Index (as of 12/31) dipped slightly to 150.39 from its highest level (150.92) since the financial crisis.**

- **Rolling 12-month CPI increased to 1.5% at the end of March; Capacity Utilization rose slightly to 79.2% in the month.**

- **Fed Funds rate remains at 0.25%, while the 10-year Treasury Yield finished March at 2.72%.**

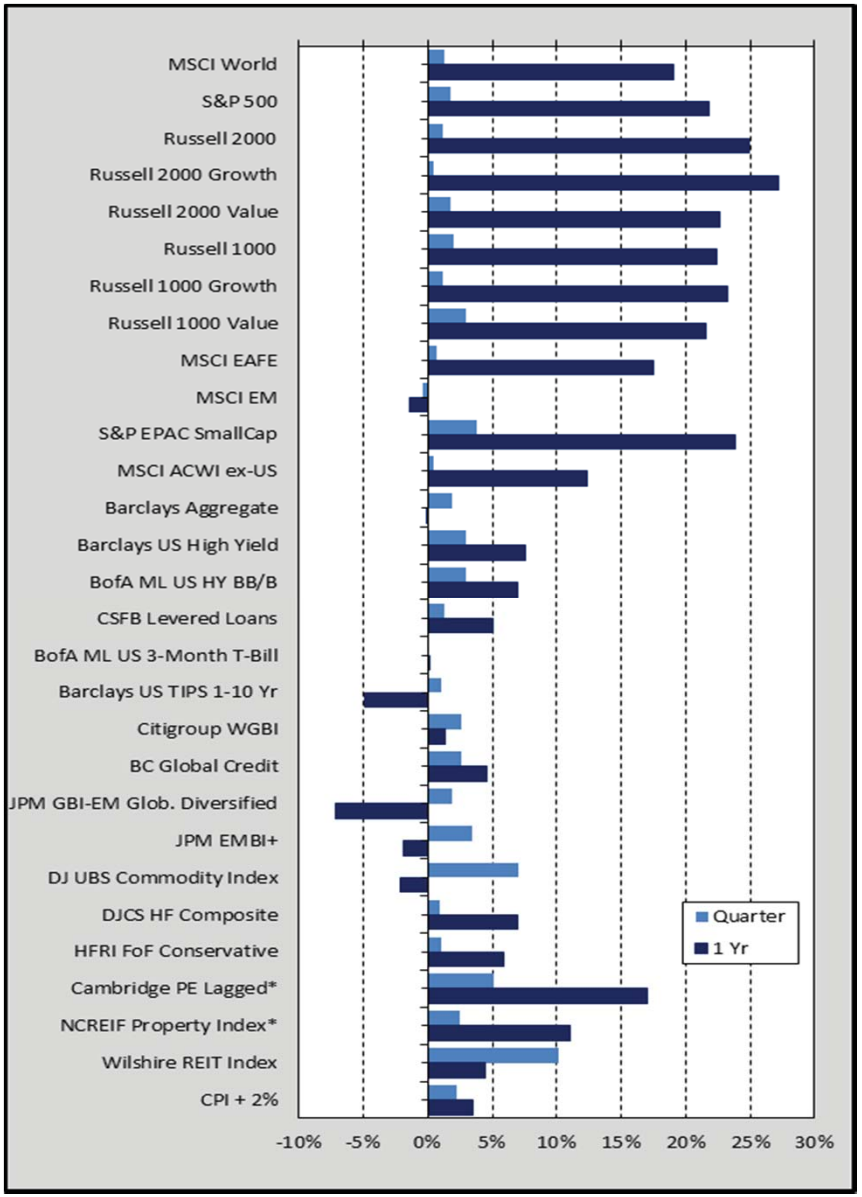
- **Fed balance sheets increased in early 2014, while European Central Bank balance sheets decreased.**
  - Large economies continue easing (Japan to the extreme), while the ECB tightens.

- **S&P valuations rose in March and remained above the 10-year and long-term averages, which are nearly equal at 16.4x, using current price/earnings ratios.**
  - Cyclically adjusted Shiller PE ratios, however, are well above the long-term average of 17.6x and above the 10-year average of 23.0x.

Market Environment – Q1 2014 Performance Summary

		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
World Equity Benchmarks						
MSCI World	World	1.3%	19.1%	10.2%	18.3%	6.8%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Domestic Equity Benchmarks						
S&P 500	Large Core	1.8%	21.9%	14.7%	21.2%	7.4%
Russell 2000	Small Core	1.1%	24.9%	13.2%	24.3%	8.5%
Russell 2000 Growth	Small Growth	0.5%	27.2%	13.6%	25.2%	8.9%
Russell 2000 Value	Small Value	1.8%	22.6%	12.7%	23.3%	8.1%
Russell 1000	Large Core	2.0%	22.4%	14.7%	21.7%	7.8%
Russell 1000 Growth	Large Growth	1.1%	23.2%	14.6%	21.7%	7.9%
Russell 1000 Value	Large Value	3.0%	21.6%	14.8%	21.8%	7.6%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
International Equity Benchmarks						
MSCI EAFE	International Developed	0.7%	17.6%	7.2%	16.0%	6.5%
MSCI EM	Emerging Equity	-0.4%	-1.4%	-2.9%	14.5%	10.1%
S&P EPAC SmallCap	Small Cap Int'l	3.8%	23.9%	9.6%	21.2%	9.4%
MSCI ACWI ex-US	World ex-US	0.5%	12.3%	4.1%	15.5%	7.1%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Domestic Fixed Income Benchmarks						
Barclays Aggregate	Core Bonds	1.8%	-0.1%	3.7%	4.8%	4.5%
Barclays US High Yield	High Yield	3.0%	7.5%	9.0%	18.2%	8.7%
BofA ML US HY BB/B	High Yield	3.0%	7.0%	8.5%	15.8%	7.9%
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%	0.1%	0.1%	0.1%	1.7%
Barclays US TIPS 1-10 Yr	Inflation	1.0%	-4.9%	2.2%	4.0%	4.0%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Global Fixed Income Benchmarks						
Citigroup WGBI	World Gov. Bonds	2.7%	1.4%	1.9%	3.8%	4.2%
BC Global Credit	Global Bonds	2.6%	4.6%	5.8%	9.9%	5.6%
JPM GBI-EM Glob. Div.	Em. Mkt. Bonds (Local)	1.9%	-7.1%	1.1%	9.8%	9.3%
JPM EMBI+	Em. Mkt. Bonds	3.5%	-1.9%	6.7%	10.9%	8.3%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Alternative Benchmarks						
DJ UBS Commodity Index	Commodity	7.0%	-2.1%	-7.4%	4.2%	0.4%
DJCS HF Composite	Hedge Fund	0.9%	7.0%	4.4%	8.7%	6.1%
HFRI FoF Conservative	Fund of Funds	1.1%	5.9%	2.7%	4.6%	2.6%
Cambridge PE Lagged*	Private Equity	5.1%	17.0%	15.5%	10.6%	15.2%
NCREIF Property Index*	Real Estate	2.5%	11.0%	11.9%	5.7%	8.4%
Wilshire REIT Index	REIT	10.1%	4.4%	10.5%	29.2%	8.2%
CPI + 2%	Inflation/Real Assets	2.3%	3.5%	3.9%	4.2%	4.6%

*As of 12/31/2013



First Quarter 2014 Market Review

Positives

- **Continued slow and steady economic growth**
  - A bit slower in the first quarter due to weather (maybe offset in Q2?)
  - Deleveraging continuing
- **Early stages of Taper generally accepted by marketplace**
  - Though priced in, "normalization" of rates appears optimistic
- **Developed world inflation is low**
  - Allows Fed continued flexibility to work through Taper
- **Emerging markets made some progress on adjustments**
  - Finally experiencing positive flows and early signs of positive performance
- **Volatility remains subdued and markets relatively stable**

Negatives

- **Potential geopolitical instability**
  - Russian invasion of Crimea has minimal economic impact
  - But tensions between Russia and West could have spillover effects
- **Benign market environment in Europe obscures challenging underlying economic conditions**
- **Inflation is low… maybe too low**
  - Global monetary stimulation has offset deflationary pressures
- **Continued slowing growth in China has global implications**
  - Could bring Chinese credit issues to forefront
- **Valuations beginning to stretch above long-term averages**
  - Developed Equity P/Es above median
  - Credit spreads approaching 2006-07 levels

Market Environment

Global Equity

- **U.S. stocks oscillated back and forth in the first quarter amid further guidance from the Federal Reserve.**
- **The S&P 500 Index rose 1.8%, while the Russell 2000 gained a modest 1.1%.**
- **International equities lagged U.S. markets, returning 0.7%, as measured by the MSCI ACWI ex-U.S. Index.**
  - Developed markets returned 0.7% as measured by the MSCI EAFE Index
  - Emerging markets returned -0.4% as measured by the MSCI Emerging Markets Index
- **Europe led non-U.S. equities as France and peripheral countries recorded robust gains. Italy and Ireland were two of the best markets for the quarter, with stocks returning roughly 14% so far this year.**
- **Despite rallying in March, emerging markets ended the quarter down 0.4% following Russia's takeover of Crimea and the continuing economic slowdown in China. Russia was the worst performing market with a -14.4% return, while Indonesia gained a hefty 21.3%.**

Private Equity

- **Private equity fund raising got off to a strong start in the first quarter with new commitments—at around $75.6 billion—keeping pace with commitments made in 2013.**
- **Asian fundraising totaled $10.8 billion in the first quarter, getting a shot in the arm as three firms raised over $1.0 billion each; Europe saw $12.0 billion of new commitments, of which 60% is to be invested in buyout and growth equity funds.**
- **Globally, buyout and growth equity commitments totaled $33.3 billion during the quarter, representing 44% of all funds raised so far this year, while energy, natural resources and infrastructure accounted for 19%.**
- **Venture capital fundraising hit $13.2 billion powered by five firms raising over $5 billion.**
- **Mezzanine funds, at $3.2 billion, accounted for only 4% of all new capital raised.**
- **Secondary funds raised only $3.1 billion in the first quarter, but we expect this number to increase to more than $20 billion as the year progresses with several large funds coming to market.**

Market Environment

Fixed Income

- **Bond markets rallied in the first quarter as investors snapped up safer, higher quality assets amid concerns around the crisis in Ukraine, an economic slowdown in China, and the unseasonably harsh winter in the U.S.**
- **The 10-year U.S. Treasury yield decreased 31 basis points to end the first quarter at 2.72%.**
- **The U.S. Credit Index gained 2.9% and the Long Duration Credit Index returned 6.3% in the first quarter. High yield bonds returned 3.0%.**
- **Investment grade credit spreads narrowed to 103 basis points, the lowest they have been since before the financial crisis. The yield spread on high yield bonds over Treasuries fell to a near record low of 3.58%.**
- **Intermediate-term Treasury Inflation-Protected Securities, or TIPS, gained 1.0% during the quarter.**
- **The Credit Suisse Leveraged Loan Index gained 1.3% during the first quarter.**
- **Local currency debt, as measured by the JP Morgan GBI-EM Index, gained 1.9%. Hard currency debt, boosted by declining Treasury yields, outperformed local currency debt during the quarter, posting returns of 3.5%.**

Market Environment

Commodities

- Commodities started the year with a bang, with the DJ-UBS Index returning 7.2% in the first quarter.
- Fears of a grain shortage following Russia's invasion of Ukraine powered returns of 8.4% in the grain sector.
- Heating oil rallied early in the quarter on the heels of unseasonably cold weather but subsequently retreated in March as temperatures returned to more normal levels, resulting in losses of 1.8% for energy.
- Precious metals declined 4% as copper prices fell amid the slowdown in China.

Real Estate

- NEPC continues to be neutral on core real estate in the U.S. and remains positive on non-core real estate, that is, value-add and opportunistic strategies, particularly in Europe.
- Within U.S. core real estate, fundamentals continue to improve with decreasing vacancy rates, increasing rents, limited new construction (outside of the apartment sector), and still attractive if narrowing income spreads relative to interest rates.
- In Europe, undervalued non-core properties and capital structure distress remain, creating more appealing prospects than in the U.S.
- Real estate debt strategies are appealing, particularly in Europe's distressed lending environment, although currency risk is a potential consideration.

Real Assets/Inflation-Linked Assets

- NEPC believes that energy, specifically in North America, represents an attractive opportunity in the up-stream and mid-stream parts of the energy value chain.
- Agriculture and metals/mining opportunities seem appealing based on long-term demographic trends despite a less certain short-term outlook.
- Timber is an area of portfolios where we would recommend underweight positions as total return targets are low with a relatively small market opportunity and managers seeking deals outside the U.S.

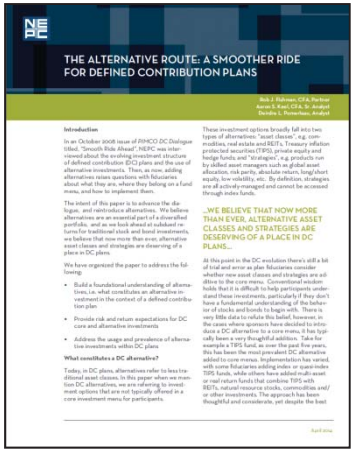
Outlook

- **Markets have generally shown resiliency so far in 2014**
  - Withstood adjustments in balance of payment challenged EM countries
  - Limited market reaction to Russia/Ukraine issues
- **U.S. taper has generally been accepted by markets**
  - Already reduced from $85 billion to $55 billion in monthly purchases
  - Rates remain low and accommodating
- **Slow and steady economic growth continues**
  - Inflation remains subdued
- **Continued low volatility may obscure underlying economic challenges**
  - European peripheral countries continue to face high unemployment
  - Many EM countries face further balance of payment adjustments
  - China faces slowing growth and potential credit issues
- **Valuations beginning to move beyond fair value**
  - While not stretched, equity P-E ratios are now above long-term averages
  - Credit spreads continue to move tighter
    - Ex: European peripheral debt
- **NEPC themes remain consistent**
  - Rebalance – remain diversified and balanced
  - Look for opportunities to be dynamic – particularly in credit
  - Allocate to emerging markets and private markets for higher returns in low return world

Highlights of First Quarter Happenings at NEPC

NEPC Research
Recent White Papers Posted

- *4Q Market Thoughts — "1997, 2007, or Something Else Altogether?"* (January 2014)
- *Moving in Different Directions: NEPC's 2014 Asset Allocation Letter* (January 2014), NEPC's Asset Allocation Committee
- *Annual Chairman's Letter* (March 2014), Richard M. Charlton, Chairman
- *Overlay Strategies: Increasing Portfolio Diversification Through Derivatives* (March 2014), Brian Roberts, CAIA, Senior Consultant
- *The Alternative Route: A Smoother Ride for Defined Contribution Plans* (April 2014), Rob J. Fishman, CFA, Partner; Aaron S. Keel, CFA, Senior Analyst; Deirdre L. Pomerleau, Analyst


THE ALTERNATIVE ROUTE: A SMOOTHER RIDE FOR DEFINED CONTRIBUTION PLANS

Rob J. Fishman, CFA, Partner
Aaron S. Keel, CFA, Sr. Analyst
Deirdre L. Pomerleau, Analyst

Introduction

In an October 2008 issue of *PIMCO DC Dialogue* titled, "Smooth Ride Ahead", NEPC was interviewed about the evolving investment structure of defined contribution (DC) plans and the use of alternative investments. Then, as now, adding alternatives raises questions with fiduciaries about what they are, where they belong on a fund menu, and how to implement them.

The intent of this paper is to advance the dialogue, and reintroduce alternatives. We believe alternatives are an essential part of a diversified portfolio, and as we look ahead at subdued returns for traditional stock and bond investments, we believe that now more than ever, alternative asset classes and strategies are deserving of a place in DC plans.

We have organized the paper to address the following:

- Build a foundational understanding of alternatives, i.e. what constitutes an alternative investment in the context of a defined contribution plan
- Provide risk and return expectations for DC core and alternative investments
- Address the usage and prevalence of alternative investments within DC plans

What constitutes a DC alternative?

Today, in DC plans, alternatives refer to less traditional asset classes. In this paper when we mention DC alternatives, we are referring to investment options that are not typically offered in a core investment menu for participants.

These investment options broadly fall into two types of alternatives: "asset classes", e.g. commodities, real estate and REITs, Treasury inflation protected securities (TIPS), private equity and hedge funds; and "strategies", e.g. products run by skilled asset managers such as global asset allocation, risk parity, absolute return, long/short equity, low volatility, etc. By definition, strategies are all actively-managed and cannot be accessed through index funds.

...WE BELIEVE THAT NOW MORE THAN EVER, ALTERNATIVE ASSET CLASSES AND STRATEGIES ARE DESERVING OF A PLACE IN DC PLANS...

At this point in the DC evolution there's still a lot of trial and error as plan fiduciaries consider whether new asset classes and strategies are suitable to the core menu. Conventional wisdom holds that it is difficult to help participants understand these investments, particularly if they don't have a fundamental understanding of the behavior of stocks and bonds to begin with. There is very little data to refute this belief, however, in the cases where sponsors have decided to introduce a DC alternative to a core menu, it has typically been a very thoughtful addition. Take for example a TIPS fund, as over the past five years, this has been the most prevalent DC alternative added to core menus. Implementation has varied, with some fiduciaries adding index or quasi-index TIPS funds, while others have added multi-asset or real return funds that combine TIPS with REITs, natural resource stocks, commodities and/or other investments. The approach has been thoughtful and considerate, yet despite the best

April 2014

Professional Staff Updates

- Tim McCusker, CFA, CAIA, FSA named Chief Investment Officer

NEPC's 19th Annual Client Conference

- May 13 and May 14, 2014
- Boston Convention Center
- Headline Speakers:
  - David M. Rubenstein, Co-Founder and Co-CEO, The Carlyle Group
  - Perry M. Traquina, CFA, Chairman and CEO, Managing Partner, Wellington Management Company

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 – Present – 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**

- *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)/15% Barclays Capital Aggregate/5% Barclays Capital High Yield/4% JP Morgan GBI-EM Global Diversified/2% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/6% NCREIF ODCE (lagged one quarter)/4% Dow Jones/UBS Commodities Index

Note: Interim SAA Policy includes a proration of 1% Private Equity, 1% Private Debt, and 2% Real Estate, which are unfunded. Private Equity was prorated to domestic equity; Real Estate was prorated to domestic equity and fixed income; Private Debt was prorated to fixed income. Recently approved Strategic Asset Allocation Policy effective July 1, 2012.

[1]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.

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 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 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% DJ UBS Commodities Index through 06/30/2012; 43% S&P 500, 25% MSCI EAFE, 28% Barclays Capital Aggregate, and 4% DJ UBS Commodities 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% DJ UBS Commodities Index through 8/31/2010; 30% Barclays Capital U.S. TIPS, 70% DJ UBS Commodities Index through 5/31/2011; 100% DJ UBS Commodities Index thereafter.

[1]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.

Reporting Methodology

- **The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC 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 fees as indicated.**

- **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 included in all respective 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.**

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