



ARIZONA STATE RETIREMENT SYSTEM

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*Paul Matson
Director*

NOTICE AND AGENDA OF PUBLIC MEETING AND POSSIBLE EXECUTIVE SESSION OF THE ARIZONA STATE RETIREMENT SYSTEM INVESTMENT COMMITTEE

3300 North Central Avenue
14th Floor Conference Room
Phoenix, Arizona 85012

June 20, 2016
2:30 p.m.

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Arizona State Retirement System (ASRS) Investment Committee (IC) and to the general public that the IC will hold a public meeting June 20, 2016 beginning at 2:30 p.m., in the 14th Floor Conference Room of the ASRS office, 3300 North Central Avenue, Phoenix, Arizona. As indicated in the following agenda, the IC may vote to go into executive session, which will not be open to the public, to discuss certain matters. IC Trustees may attend either in person or by telephone conference call.

Pursuant to A.R.S. § 38-431.03(A)(3), the IC may vote to go into executive session, which will not be open to the public, for the purpose of obtaining legal advice on any item on the agenda.

This is a regularly scheduled meeting of the IC; however, due to possible attendance by other ASRS Board Trustees, this meeting may technically become a meeting of the Board or one of its Committees. Actions taken will be consistent with IC governance procedures. Actions requiring Board authority will be presented to the full Board for final decision.

The Chair may take public comment during any agenda item. If any member of the public wishes to speak to a particular agenda item, they should complete a Request to Speak form indicating the item and provide it to the Committee Administrator.

This meeting will be teleconferenced to the ASRS office in Tucson, 4400 E. Broadway Blvd., Suite 200, Tucson, AZ 85711. The conference call to Tucson will be disconnected after 15 minutes if there are no attendees in the Tucson audience.

The Agenda for the meeting is as follows:

1. Call to Order; Roll Call (estimated time 4 min.) Mr. Tom Connelly
Chair, Investment Committee

2. Approval of Minutes of the February 22, 2016 and April 25, 2016 IC Meeting (Action item; estimated time 1 min.) Mr. Tom Connelly

3. Presentation, Discussion, and Appropriate Action Regarding the ASRS House Views and General Discussion (Informational and discussion item; estimated time 20 min.)
..... Mr. Karl Polen
Chief Investment Officer, ASRS
..... Ms. Kerry White
Assistant Chief Investment Officer for Reporting, Compliance & Administration, ASRS
..... Mr. Al Alaimo
Sr. Portfolio Manager of Fixed Income, Cash, and Liquid Alternatives, ASRS
..... Mr. Eric Glass
Sr. Portfolio Manager of Private Markets, ASRS
..... Mr. Cole Smith
Portfolio Manager of Equities, ASRS
..... Mr. John Kwon
Portfolio Manager of Equities, ASRS
..... Mr. Micheal Copeland
Assistant Portfolio Manager of Real Estate, ASRS
..... Ms. Lupita Breland
Sr. Portfolio Analyst, ASRS
..... Mr. John Doran
Assistant Portfolio Manager of Cash and Liquid Alternatives, ASRS

Objective:

The Committee and ASRS team will discuss House Views and other matters of interest.

The IC may vote to discuss the following matter in executive session pursuant to A.R.S. §§ 38-431.03(A)(2) and 38-718(P) to consider specific manager data that is deemed proprietary information.

4. Presentation, Discussion, and Appropriate Action Regarding the Portfolio Position and Performance (Informational and discussion item; estimated time 15 min.) Mr. Paul Matson
Director, ASRS
..... Mr. Karl Polen
..... Mr. Al Alaimo
..... Mr. Eric Glass
..... Ms. Kerry White

Objective:

The Committee will discuss portfolio positioning, current tactical views and investment performance.

The IC may vote to discuss the following matter in executive session pursuant to A.R.S. §§ 38-431.03(A)(2) and 38-718(P) to consider specific manager data that is deemed proprietary information.

5. Presentation, Discussion, and Appropriate Action Regarding Investment Compliance Review and Risk Management Reporting (Informational and discussion item; estimated time 20 min.)
..... Ms. Lupita Breland
..... Mr. Micheal Copeland
..... Mr. Dan Gillespie
Vice President and Unit Head, State Street
..... Mr. Gadi Kaufmann
Managing Director and CEO, RCLCO
..... Mr. Kien Trinh
Assistant Vice President, Risk Services, State Street Analytics

Objective:

The compliance working group will present the compliance framework for public and private markets investments. State Street will present the results of their compliance monitoring for public markets portfolios. RCLCO will present the results of their compliance monitoring on the real estate separate accounts. State Street will present the latest version of the Risk Report.

6. Presentation, Discussion, and Appropriate Action Regarding IMD Activities and Asset Class Committee Reports (Informational and discussion item; estimated time 10 min.).....
.....Mr. Karl Polen
..... Mr. Paul Matson

Objective:

The CIO will present recent activities and work plans for IMD. The chairs of the asset class committees will report on any activity since the last IC meeting.

The IC may vote to discuss the following matter in executive session pursuant to A.R.S. §§ 38-431.03(A)(2) and 38-718(P) to consider specific manager data that is deemed proprietary information.

7. Presentation, Discussion, and Appropriate Action Regarding Independent Reporting, Monitoring and Oversight of the ASRS Investment Program – Includes Total Fund and Investment Performance Report Q1-16 (Informational and discussion item; estimated time 30 min.).....
..... Mr. Allan Martin
Partner, NEPC
..... Mr. Dan LeBeau
Consultant, NEPC

Objective:

NEPC will report on first quarter 2016 investment results and their monitoring of the ASRS investment program.

The IC may vote to discuss the following matter in executive session pursuant to A.R.S. §§ 38-431.03(A)(2) and 38-718(P) to consider specific manager data that is deemed proprietary information.

8. Presentation, Discussion, and Appropriate Action Regarding Working Group Reports (Informational and discussion item; estimated time 15 min.).....Mr. John Doran
.....Mr. Micheal Copeland

Objective:

Members of the multi asset class working group will present to the committee the results of their analysis of the multi asset class and any changes to the program as a result of that work.

The IC may vote to discuss the following matter in executive session pursuant to A.R.S. §§ 38-431.03(A)(2) and 38-718(P) to consider specific manager data that is deemed proprietary information.

9. Presentation, Discussion, and Appropriate Action Regarding the Real Estate Consultant (Action item; estimated time 20 min.) Mr. Eric Glass
.....Mr. Micheal Copeland

Objective:

In accordance with state procurement law, the ASRS has conducted a Request for Proposal for its real estate consulting requirements. The private markets team will recommend firms for its real estate consulting requirements. The committee will decide whether to approve the recommendation.

The IC may vote to discuss the following matter in executive session pursuant to A.R.S. §§ 38-431.03(A)(2) and 38-718(P) to consider specific manager data that is deemed proprietary information.

10. Presentation, Discussion, and Appropriate Action Regarding the Fixed Income Asset Class Presentation (Informational and discussion item; estimated time 45 min.)..... Mr. Al Alaimo

Objective:

Mr. Alaimo will update the committee on the fixed income asset class.

11. Request for Future Agenda Items (Informational and discussion item; estimated time 5 min.)
..... Mr. Tom Connelly
..... Mr. Karl Polen

12. Call to the Public..... Mr. Tom Connelly

Those wishing to address the IC are required to complete a Request to Speak form before the meeting indicating their desire to speak. Request to Speak forms are available at the sign-in desk and should be given to the IC Administrator. IC Trustees may not discuss items that are not specifically identified on the agenda. Therefore, pursuant to A.R.S. § 38-431.01(H), action taken as a result of public comment will be limited to directing staff to study the matter, responding to any criticism or scheduling the matter for further consideration and decision at a later date.

13. The next ASRS IC Meeting is scheduled for Monday, August 22, 2016 at 2:30 p.m., at 3300 N. Central Avenue, 14th Floor Conference room, Phoenix, Arizona.

14. Adjournment of the ASRS IC Meeting

A copy of the agenda background material provided to IC Trustees (with the exception of material relating to possible executive sessions) is available for public inspection at the ASRS offices located at 3300 North Central Avenue, 14th Floor, Phoenix, Arizona, and 4400 E. East Broadway Boulevard, Suite 200, Tucson, Arizona 85711. The agenda is subject to revision up to 24 hours prior to meeting. These materials are also available on the ASRS website (<https://www.azasrs.gov/web/BoardCommittees.do>) approximately 48 hours prior to the meeting

Persons with a disability may request a reasonable accommodation such as a sign language interpreter or alternate formats of this document by contacting Tracy Darmer, ADA Coordinator at (602) 240-5378 in Phoenix, at (520) 239-3100, ext. 5378 in Tucson or 1-800-621-3778, ext. 5378 outside metro Phoenix or Tucson. Requests should be made as early as possible to allow time to arrange the accommodations

Dated June 8, 2016

ARIZONA STATE RETIREMENT SYSTEM

SIGNED COPY ON FILE

Gloria Montiel
Committee Administrator

SIGNED COPY ON FILE

Karl Polen
Chief Investment Officer

Agenda Item #2



ARIZONA STATE RETIREMENT SYSTEM

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*Paul Matson
Director*

MINUTES OF THE PUBLIC MEETING OF THE ARIZONA STATE RETIREMENT SYSTEM INVESTMENT COMMITTEE

HELD ON
Monday, February 22, 2016
2:30 p.m.

The Arizona State Retirement System (ASRS) Investment Committee (IC) met at 3300 N. Central Avenue, 14th Floor, Phoenix, AZ 85012. The meeting was also teleconferenced to the ASRS office at 4400 E. Broadway Boulevard, Suite 200, Tucson, Arizona 85711.

Mr. Tom Connelly, Chair, called the meeting to order at 2:37 p.m.

1. Call to Order; Roll Call; Opening Remarks

Present: Mr. Tom Connelly, Chair
Prof. Dennis Hoffman
Mr. Robert Wadsworth

Absent: Mr. Lorenzo Romero

A quorum was present for the purpose of conducting business.

2. Approval of Minutes of the October 26, 2015 Investment Committee Meeting Minutes

Motion: Mr. Robert Wadsworth moved to approve the minutes of the November 30, 2015 public meeting. Prof. Dennis Hoffman seconded the motion.

By a vote of 3 in favor, 0 opposed, 0 abstention, and 1 excused, the motion was approved.

3. Presentation, Discussion, and Appropriate Action Regarding ASRS Investment Program Updates

Mr. Gary Dokes, Chief Investment Officer (CIO), introduced himself and turned the meeting over to IMD Portfolio Managers (PM) to discuss their perspectives on the market, House Views and provide an update on their respective asset classes.

Mr. Underwood, Sr. Portfolio Manager of Public Equities, provided an update on Public Equities; Mr. Al Alaimo, Fixed Income Portfolio Manager, provided an update on Fixed Income, and Mr. Eric Glass, Private Markets Portfolio Manager, provided an update on Private Equity and Commodities.

Mr. Kien Trinh, State Street Investment Analytics, presented the State Street Risk Report. He discussed the monthly reallocation summary, month-end risk profile and total plan overview exposure.

4. Presentation, Discussion, and Appropriate Action Regarding Independent Reporting, Monitoring and Oversight of the ASRS Investment Program – Includes Total Fund and Investment Performance Report Q4-15

Mr. Allan Martin, NEPC Consultant, provided the Committee with a brief overview of NEPC's oversight of the ASRS Investment Program.

Performance results: (as of December 30, 2015)

- 7.5% (20-year annualized net return) vs. 8% (actuarial assumed interest rate)

	Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception 06/30/75
Total Fund	2.7%	1.83%	8.3%	7.8%	6.1%	9.7%
Interim SAA Policy*	1.6%	-0.4%	6.7%	6.9%	5.6%	9.4%
Excess Return	1.1%	1.7%	1.6%	0.9%	0.5%	0.3%

**Interim SAA Policy: 21% S&P 500/3% S&P 400/3% S&P 600/18% MSCI EAFE/2% MSCI EAFE Small Cap/5% MSCI Emerging Markets/8% Russell 2000 (lagged one quarter)/15% Barclays Capital Aggregate/4% Barclays Capital High Yield/6% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/8% NCREIF ODCE (lagged one quarter)/2% Bloomberg Commodity Index/5% Multi Asset Class Custom Index*

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

5. Presentation, Discussion, and Appropriate Action Regarding the Public Equity Portfolio Trade Analysis

Mr. Underwood, provided the Committee with a brief description of the trade cost analysis conducted by Elkins-McSherry. He noted such reports benefit the ASRS Investment Management Division (IMD) by serving as a managing tool designed to provide a full analysis of trading cost for both internal and externally managed public equity portfolios. He then turned the meeting over to John Papa, Client Service Representative with Elkins-McSherry.

Mr. Papa addressed the Committee with a comprehensive analysis of total transaction costs, commissions, fees and market impact, noting execution costs are scored relative to institutional universes that are maintained and continually updated in the Elkins-McSherry database.

6. Request for Future Agenda Items

There were no requests for future agenda items.

7. Call to the Public

No members of the public requested to speak.

8. Adjournment

The meeting adjourned at 4:35 p.m.



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Paul Matson
Director

MINUTES OF THE PUBLIC MEETING OF THE ARIZONA STATE RETIREMENT SYSTEM INVESTMENT COMMITTEE

HELD ON
Monday, April 25, 2016
2:30 p.m.

The Arizona State Retirement System (ASRS) Investment Committee (IC) met at 3300 N. Central Avenue, 14th Floor, Phoenix, AZ 85012. The meeting was also teleconferenced to the ASRS office at 4400 E. Broadway Boulevard, Suite 200, Tucson, Arizona 85711.

Mr. Tom Connelly, IC Chair, called the meeting to order at 2:33 p.m.

1. Call to Order; Roll Call; Opening Remarks

Present: Mr. Tom Connelly, Chair
Prof. Dennis Hoffman

Absent: Mr. Lorenzo Romero
Mr. Robert Wadsworth

A quorum was not present for the purpose of conducting business. Committee Trustees opted to continue the meeting as a general discussion.

2. Approval of Minutes of the February 26, 2016 Investment Committee Meeting Minutes

Mr. Connelly advised the Committee the meeting minutes of the February 20, 2016 IC will be reviewed and approved at the next IC meeting scheduled for June 20, 2016.

3. Presentation, Discussion, and Appropriate Action Regarding the ASRS Investment Management Division's (IMD) Reorganization and Work Processes

Mr. Karl Polen introduced himself to the Committee as the new Chief Investment Officer for the Arizona State Retirement System. He explained the changes within the Investment Management Division (IMD) with respect to the structure of the new organization chart and noted the vacancies within the department, which he hopes to have filled within the months to come. He noted the development and structure of the Investment Strategy, Asset Class and Tactical Positioning Committee meetings, and explained the meetings consist of the Executive Director, Chief Investment Officer, Assistant Chief Investment Officer and the appropriate portfolio managers. All meetings are also structured to ensure compliance with Strategic Investment Policy (SIP) 006.

4. Presentation, Discussion, and Appropriate Action Regarding the ASRS House Views and General Discussion

Mr. Polen briefly introduced the topic to the Committee and turned the meeting over to portfolio managers, each whom provided their viewpoint on the market with respect to their relevant asset classes:

- Mr. Cole Smith, Assistance Portfolio Manager, provided his perspective on U.S. equities
- Mr. John Kwon, Assistant Portfolio Manager, provided his perspective on non U.S. equities
- Mr. Micheal Copeland, Assistant Portfolio Manager of Real Estate, provided his perspective on real estate
- Mr. Eric Glass, Sr. Portfolio Manager of Privates Market, provided his perspective on private equities and commodities

5. Presentation, Discussion, and Appropriate Action Regarding Portfolio Position, Performance, and Risk Report

Mr. Kien Trinh, State Street Investment Analytics, presented the State Street Risk Report. He discussed the monthly reallocation summary, month-end risk profile and total plan overview exposure.

6. Presentation, Discussion, and Appropriate Action Regarding Asset Class Committee Reports

Mr. Polen began the discussion by providing a brief overview of the ongoing activities in the Private Markets Committee meetings. He noted IMD held a Private Markets Committee meeting on April 22, and the next Public Markets Committee meeting is scheduled for May 2, 2016. The next Private Markets meeting is scheduled for June of 2016, at which time the Committee will review a mid-year update to the placing plans for private equity and real estate.

7. Presentation, Discussion, and Appropriate Action Regarding Independent Reporting, Monitoring and Oversight of the ASRS Investment Program

Mr. Dan LeBeau, NEPC Consultant, provided the Committee with a brief overview of NEPC's reporting, monitoring and oversight of the ASRS Investment Program. He reviewed the ongoing activities within IMD and confirmed all investment activities and tactical positioning of the fund are in compliance with the Strategic Asset Allocation Policy and consistent with IMD House Views.

Mr. Hoffman inquired to what extent NEPC is involved with Private Market and Public Market meetings. Mr. LeBeau stated NEPC makes every attempt to be present at each meeting and reviews meeting materials to ensure all new investments are in compliance with SIP006.

8. Presentation, Discussion, and Appropriate Action Regarding Working Group Reports

Ms. Lupita Breland, Sr. Portfolio Analyst, John Doran, Assistant Portfolio Manager of Cash and Liquid Alternatives, Mr. Kwon and Mr. Smith, all members of the Cash Management Working Group, presented an overview of the working group's goals, as well as the current and futures initiatives for the optimization methods of cash management and assetization aimed at minimizing transaction costs and performance drag.

9. Presentation, Discussion, and Appropriate Action Regarding Public Equities Asset Class Presentation

Mr. Smith and Mr. Kwon, provided the Committee with a summary of the Public Equities Asset Class, which included ongoing activities within their respective asset class, asset allocation and performance.

10. Presentation, Discussion, and Appropriate Action Regarding Private Equities Asset Class Presentation

Mr. Glass provided a summary of the Private Equity Program. He noted details relating to introduction of the program, performance and portfolio composition. He further discussed the underwriting process of the program, which is based on three contributing factors: Strategy, Track Record and Organization Dynamics.

11. Request for Future Agenda Items

There were no requests for future agenda items.

12. Call to the Public

No members of the public requested to speak.

13. Adjournment

The meeting adjourned at 5:09 p.m.

Respectfully submitted,

ARIZONA STATE RETIREMENT SYSTEM

Gloria Montiel Date
Investment Committee Administrator

Karl Polen Date
Chief Investment Officer

Agenda Item #3

ARIZONA STATE RETIREMENT SYSTEM INVESTMENT MANAGEMENT HOUSE VIEWS

(Notable changes from the previous month are highlighted in **RED**)

JUNE 2016

U.S. EQUITIES

Primary Market Metrics & Indicators:

1. Fundamentals: **NEUTRAL**

- Economic data still shows moderate growth in 2016.
- Households wage growth continues to strengthen although the recent employment picture has deteriorated, the housing market has momentum, and credit creation has picked up. The recent rebound in energy prices is a dampener, particularly for lower income households.
- Corporations have exhibited waning credit demand, production growth has slowed, and the dollar has strengthened over the last month. Looking forward, the peak drag on capital spending from energy companies has passed while foreign growth has upside potential.
- Inflation remains generally subdued and below the Fed's target. The market is discounting a continuation of low inflation levels while pressures to the upside exist at the margin.
- While a 25bps rate hike is priced in by the Fed, the recent jobs report will likely delay the timing. The negative December market reaction exemplifies the short-term sensitivity to be aware of.

2. Valuations: **NEUTRAL**

- The large cap P/E ratio of 19 is at the top of its 5 and 10 year ranges. The mid cap P/E ratio of 21 is marginally above the average of its 5 and 10 year ranges. The small cap P/E ratio of 24 is at the average of its 5 and 10 year ranges.
- On a relative value basis, the S&P PE ratio is on the low end compared to the EAFE PE ratio versus history. On a relative value basis, the S&P PE ratio is at the midpoint compared to the Emerging Markets PE ratio versus history.

3. Sentiment: **NEUTRAL**

- With the exception of dips in Q3 2015 and Q1 2016, the market has been flat since the beginning of 2015; reflecting mixed macro data globally, downward revisions to corporate growth estimates, apprehension over the timing of a rate hike, and volatile foreign exchange markets.
- Fund flows reflect a modest appetite for U.S. equities on an absolute basis, but have been outpaced by demand for U.S. fixed income products.

- After a very strong run since the middle of 2014, the U.S. dollar fell from the beginning of the year through April. After rebounding during May, the dollar again showed weakness at the start of June which has given some lift to equities.

Commentary:

We remain cautious about U.S. equities and remain close to the benchmark weight. Domestically, we are slightly overweight to mid and small caps reflecting the relative richness of large caps. The U.S. equity bull market has enjoyed a long run and flattening of both profit margin expansion and revenue growth reflect being in the late stage of the business cycle. An accommodative Fed has been sensitive to this and compared to the rest of the world, the U.S. has exhibited stability if not momentum for its economic prospects. Prospectively, we expect to see mixed results in the stimulative efforts globally but should the picture change, we will adapt accordingly.

CURRENT PORTFOLIO POSTURE: EQUAL WEIGHT vs. SAA target

NON – U.S. EQUITIES

Primary Market Metrics & Indicators:

1. Fundamentals: **NEUTRAL (Developed), NEGATIVE (Emerging)**

- Central bank policies have been accommodative in Eurozone and Japan, albeit with mixed results as Europe has shown signs of life at the margin while Japan’s experiment with negative interest rates has failed to create traction.
 - ◇ The ECB appears to be in wait and see mode as it assesses the effects of its latest policy measures. The recent GDP forecast was revised up, but still remains below 1.7%, and inflation remains at 0%. Further policy action is likely if there isn’t a pick-up in either.
 - ◇ Japan postponed the VAT increase for the second time but the Yen continues to strengthen and appears increasingly in need of coordinated fiscal stimulus.
 - ◇ The UK’s growth remains strong relative to the Eurozone but with the headwinds of a strong currency, Brexit uncertainty overhang, and exporters losing share.
- China continues to be a source of uncertainty as it attempts to maintain its 6.5% target growth rate. Incremental efforts to stimulate the economy have been less effective than in the past and reverted to construction related efforts which have stoked bad debt fears.

2. Valuations: **POSITIVE (Developed), POSITIVE (Emerging)**

- In looking at an equal-weighted mix of PE, P/book, dividend yield, P/sales, and EV/EBITDA, EAFE and Emerging Markets are both attractively valued relative to the S&P 500.
 - ◇ Within EAFE, Japan is trading cheaper than the UK and the Eurozone.
- On a relative value basis, the Emerging Markets PE ratio is on the low end compared to the EAFE PE ratio versus history.

3. Sentiment: **NEUTRAL (Developed), NEGATIVE (Emerging)**
- The prospect of Brexit has added a political element to markets.
 - Flows have tended away from Japan, Europe and China year-to-date reflecting relative uncertainty compared to the U.S.
 - China continues to be polarizing as it struggles to navigate toward the One Belt One Road plan. Several other emerging market economies hinge upon China, while India continues to attract positive attention while it has been embroiled in controversy.

Commentary:

We reallocated \$750M to EAFE in April with a tilt toward Europe and away from Japan reflecting our position that Europe will continue to be more effective in turning its economy around. In aggregate, we are in line with the Non-US equity benchmark weight. Draghi stepped up the pace of its bond buying program and continues to implement negative rates while exhibiting patience to see results. Japan's inability to drive growth from coordinated fiscal and monetary policy portends a bigger need for action with fewer options over time.

We remain underweight emerging markets on the premise that while they may be attractive from a valuation standpoint, China's ability to manufacture growth has been waning and creates uncertainty about their ability to manage its glidepath towards reasonable debt levels.

We are closely watching the momentum of Europe's growth and the quality of growth in emerging markets.

CURRENT PORTFOLIO POSTURE: OVER WEIGHT (Developed) and UNDERWEIGHT (Emerging) vs. SAA target

FIXED INCOME

Primary Markets Metrics & Indicators:

1. Fundamentals: **NEUTRAL**
- Global fundamentals are mixed. While the economy in the U.S. is generally improving, many international economies that influence U.S. fixed income markets are struggling to grow (Japan, Europe), facing a slowdown (China), or experiencing recessionary conditions (some emerging market countries). Following a selloff in risky assets earlier this year as well as in 2015, a number of factors have led to a rally in the past **few months** in equities, high yield bonds, investment-grade bonds and other areas of the credit markets. These factors include moderating expectations for interest rate increases by the Fed; more expansionary monetary policy in Europe and Japan; a rally in oil prices; and moderating fears of major currency devaluation in China. However, we are concerned that the recent rally in risk assets may reverse as the year progresses. Global growth may sputter and China risk issues may resurface.

- We believe that long-term U.S. interest rates may remain relatively low by historical standards for a number of reasons. These include slowing growth and disinflationary (or deflationary) pressures in many regions of the world including Europe and China, accommodative monetary policies in other countries and very low **or negative** competing long-term interest rates in other developed markets.

2. Valuations: **NEUTRAL**

- Valuations as measured by credit spreads in both the investment-grade and high yield bond markets may seem attractive relative to the tighter levels experienced in recent years; however, the wider spreads may primarily reflect deteriorating credit quality. Over the coming years, we expect both a rise in corporate defaults and an increase in the number of bond issuers that are likely to lose their investment-grade ratings. Initially, this deterioration in credit quality will be led by sectors that have been adversely affected by the severe decline in global commodity prices including energy, energy services, metals and mining. However, as we **are likely** in the later stages of credit cycle (that began with an upturn in 2009), credit ratings **will likely** decline and defaults **will likely** increase in other sectors as well. We believe this may lead **to a spike in defaults (probably in 2017) and further spread widening before the market bottoms. This should create attractive opportunities for our distressed debt managers in the Opportunistic Debt asset class.** With this view, we are underweight High Yield vs. the SAA target.
- Private debt offers the most attractive opportunity in the fixed income markets with double-digit yields readily available for investors willing to accept illiquidity. We believe the market opportunity has recently improved due to a number of factors including the piecemeal sale of GE Capital, a leading provider of capital to the middle market; a reduced capacity to lend by business development companies; the enforcement of leveraged lending guidelines by banking regulators which further restricts the ability of banks to provide leveraged loans and underwrite high yield bonds; and a materially less receptive new issuance market for high yield bonds and tradable leveraged loans. In 2015 **and 2016**, we expanded our commitments to take advantage of the attractive opportunities in the private debt asset class.
- The Interest Rate Sensitive fixed income markets are likely to generate low returns due to low overall yields as Treasury rates remain at low levels. That being said, Interest Rate Sensitive fixed income remains a safe haven in times of market turbulence and tends to perform well when risky assets such as equities sell-off. While we are slightly underweight Interest Rate Sensitive fixed income vs. the interim SAA target, we have more interest rate duration in our portfolio than the benchmark due to an allocation made in August 2015 to the Treasuries (Long Duration) asset class. This allocation has performed well when risky assets have sold off.

3. Sentiment: **NEUTRAL**

- Sentiment has declined in the credit markets due to a combination of weakening fundamentals and diminished trading liquidity **but remains favorable for U.S. Treasuries.** U.S. Treasuries continue to be an attractive safe haven for investors looking to reduce risk

particularly as interest rates in other safe haven countries such as Germany and Japan are extremely low or even negative depending on the maturity.

Commentary:

IMD views of the fixed income markets are bifurcated: we are positive on the return opportunities in the private markets (i.e. Private Debt) and less sanguine on the public markets (i.e. Interest Rate Sensitive fixed income and High Yield bonds).

CURRENT PORTFOLIO POSTURE: OVER WEIGHT vs. SAA target

REAL ESTATE

Primary Market Metrics & Indicators:

1. Fundamentals: POSITIVE

- Property markets are generally moving out of a recovery phase to a mature phase. Excess inventory from the last cycle is largely absorbed and greater discipline in new supply delivery places property markets generally in reasonable supply/demand balance. The only property types that we consider to still be in a recovery phase are for-sale residential, suburban office and certain niche industrial property types.
- Local conditions vary greatly with tight supply and rapidly accelerating rents in certain markets and a more normal recovery in other markets.
- Our review of property market fundamentals leads us to emphasize apartments, industrial properties, medical office buildings, senior housing, self-storage, and student housing in our current investing efforts for demographic and macro policy reasons. We have entered in to separate account partnerships to pursue these opportunities.
- The resolution of pre-global financial crisis CMBS structures continues to work its way through the system presenting opportunities in mezzanine and senior equity. We have retained managers well-positioned to pursue such opportunities.

2. Valuations: NEUTRAL

- Values have recovered from the global financial crisis with stable properties in coastal markets priced at record values.
- YTD in 2016 there has been a contraction in the pace of CMBS lending and an increase in the pricing of the underlying loans.
- Recent increases in treasury rates do not appear to have affected commercial real estate valuations. Many observers believe that ~100bps of rate increase was already discounted into cap rates.
- At the end of April, REITs were trading at an average dividend yield of 3.9% (211bp above 10y treasury) and a 1% discount to NAV. The dividend yield spread is above the historical average of 127 while the historical difference to NAV is a 3% premium.

3. Sentiment: NEUTRAL

- About 80% of real estate executives believe we will see a recessionary cycle in property sometime in the next several years.
- Nevertheless, fund raising has been robust. The pace of U.S. focused real estate fund raising is around \$100 billion per year with dry powder of around \$200 billion. Additionally, there is evidence of high interest in U.S. property from foreign investors.
- Consequently, there remains strong demand for good quality property and we have yet to see any softness in pricing as a result of recessionary or other concerns.

Commentary:

ASRS has become more cautious in property underwriting and requires its managers to consider a moderate recession in the next few years in property level underwriting. We continue to focus on niche property types and markets which receive less institutional focus. In new transactions, we will generally avoid construction risk except in the strongest locations with supply constraints and robust tenant demand. The 2016 implementation plan calls for about \$300 million in new commitments to complete the separate account and net zero new investments in commingled product.

CURRENT PORTFOLIO POSTURE: UNDERWEIGHT vs. SAA target (in program funding/build-out phase)

PRIVATE EQUITY

Primary Market Metrics & Indicators:

1. Fundamentals: POSITIVE

- The U.S. economy has moderated and inflation remains muted but the unemployment rate continues to fall.
 - ◇ Oil prices have settled in the \$40 price range which has resulted in rig lay downs and reduced service costs, which has tempered production growth in the medium term. Debt markets have locked up and equity transactions will take time to sort out. We expect industry consolidation at the margin favoring low cost producers with less leverage and more hedged production.
 - ◇ Healthcare is being reshaped to implement the requirements of “Obamacare.”
 - ◇ The U.S. continues to be a global leader in technology innovation.
- Europe continues to struggle in recovering from the financial crisis with the ECB maintaining its stimulus efforts by buying €80B per month. Its problems are exacerbated by a unified currency without unified fiscal policy and it is expected to experience a very slow recovery.
- Emerging markets have slowed while the largest emerging markets are transitioning to focus on domestic consumption.

2. Valuations: **NEUTRAL**

- Current U.S. median purchase price multiples are 8.5x, down from 8.9x a year ago.
- The leveraged loan and high yield debt markets tightened up in 2015. Single B high yield spreads have widened to ~800bps.
- The U.S. median Debt/EBITDA ratio of 6.2x is up a bit from 5.8x in 2014.

3. Sentiment: **NEUTRAL**

- Globally, \$551B (1,062 funds) closed in 2015 compared to \$589B (1,394 funds) in 2014.
- Dry powder of nearly \$1.3T globally has ticked up from \$1.2T for 2014.
- The global number of buyout deals was 3,556 in 2015 compared to 3,796 for all of 2014. The aggregate value of deals was \$411B in 2015 compared to \$348B for all of 2014.
- There were 1,620 exits representing \$405B in 2015. There were 1,734 exits representing \$460B in 2014.
- The IPO market in 2015 has softened to a level of \$30B in 2015 versus \$67B in 2014.

Commentary:

Areas of emphasis are U.S. middle market buyout with focus on managers with strong operational capability. Vertical strategies in healthcare and technology are under consideration. IMD will reduce emphasis on large buyout strategies though larger managers with specialized deal flow remain of interest and continue to monitor Europe for a favorable reentry point and look for opportunities to capitalize upon distress.

ASRS 2016 private equity pacing plan calls for \$700 million in new commitments to achieve the 8% strategic allocation target.

CURRENT PORTFOLIO POSTURE: EQUAL WEIGHT vs. SAA target

COMMODITIES

Primary Market Metrics & Indicators:

1. Fundamentals: **NEUTRAL**

- The U.S. dollar has weakened year-to-date but remains strong on a relative basis. Questions remain about China's economy while Europe continues to struggle.
- Most commodity sectors appear well supplied, particularly for the current global growth environment.
- Corn and wheat stockpiles have recently hit multi-year highs while world food prices continue to slide. The decision by Saudi Arabia to freeze its production level has given the market optimism and **points the arrow toward coming into balance**. Metals are mixed as precious metals have strengthened while industrial metals still exhibit weak demand.

2. Valuations: **NEGATIVE**

- The Bloomberg Commodities Index is up 12% year-to-date as the dollar has weakened which is unlikely to persist over a longer time period given the impetus for global central banks to ease.
- Our bottoms-up model forecasts a small decline of ~2% while our top down model predicts a 1% increase over the next quarter.

3. Sentiment: **NEUTRAL**

- Moderate growth, weak inflation, and a strong supply environment kept investor enthusiasm for commodities muted until recently as energy and precious metals have rallied.
- While China reverted to stimulating its economy via construction activity, the sustainability is not likely to persist.
- Saudi Arabia has agreed to freeze output at current levels although an OPEC consensus is elusive. Domestically the rig layoffs have curtailed production. Nearing the \$50 range the shale plays may begin to bring production back online.

Commentary:

We remain underweight commodities based on the fundamental basis that global growth remains modest and inflation is muted. At the commodity specific level, energy markets have run up in anticipation of the market balancing although levels are approaching a point where shale plays may reactivate and Iran is ramping its production. Ags have benefitted from poor weather in South America and a warm start to the growing season in the U.S. Precious metals have rallied on dollar weakness while base metals still have a weak picture. Should growth and inflation exhibit more traction we will revisit our position.

CURRENT PORTFOLIO POSTURE: UNDERWEIGHT vs. SAA target

OPPORTUNISTIC INVESTMENTS

IMD continues to monitor and assess co-investment flow from real estate, private equity and debt managers for select opportunistic investments with favorable capital market dynamics. Opportunistic investments are tactical in nature AND are outside ASRS SAAP benchmarks or absolute return oriented.

CURRENT PORTFOLIO POSTURE: Approx. 4.8% of ASRS TOTAL MARKET VALUE

GLOSSARY

Commentary: Provides verbiage on 1) the current asset class market environment and possible changes to this environment and 2) ASRS asset class portfolio positioning relative to ASRS SAA policy, its rationale for positioning and anticipated changes which may occur in such positioning.

Current Portfolio Posture: Indicates ASRS asset class position relative to its asset allocation policy weight. “Overweight” indicates an asset class weight is greater than its policy target, “Neutral” indicates an equal weight and “Underweight” indicates a lesser weight than its policy target.

Investment House Views: Synthesizes IMD’s current and forward-looking investment perspectives and tactical positioning in asset classes and investment strategies in which the ASRS invests.

Primary Market Metrics and Indicators: Broadly-defined metrics (Fundamentals, Valuations, and Sentiments) applied universally to ASRS asset classes and used collectively to evaluate existing market conditions. Indicators (“Positive,” “Neutral” and “Negative”) reflect IMD’s existing views of these metrics and, in addition to other factors, generally determine the basis for the existing (and possible future changes) to ASRS aggregate portfolio position relative to or within ASRS SAA policy targets.

Agenda Item #4

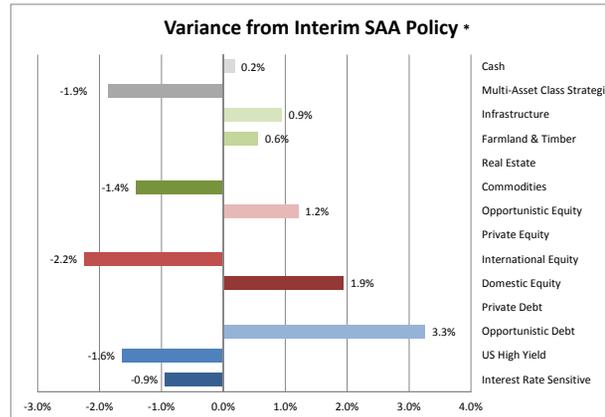
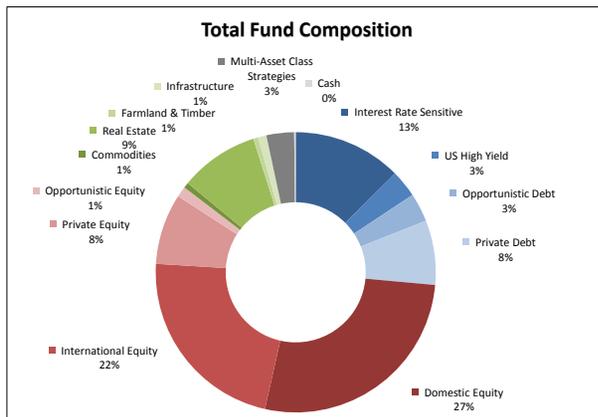
Investment Report

Arizona State Retirement System

June 20, 2016

Portfolio Positioning

Total Fund Positioning May 31, 2016



All Private Markets asset classes' market values are reported on a quarter-lag basis and adjusted to include the current quarter's cash flow.

Asset Allocation

Pension (Plan, System, HBS Assets)		ASRS Market Value Report				Tuesday, May 31, 2016			
Account Manager	Account Manager Style	Fixed Income		Equity		Inflation Linked	Multi-Asset	Total	Pct of Fund
		Active	Enh/Passive	Active	Enh/Passive				
State Street B&T: Boston	Tactical Cash (non-assetized)							0	0.00%
	Operating Cash (non-assetized)		10,637,295					10,637,295	0.03%
	Cash Total							\$10,756,256	0.03%
									0.00%
Blackrock: San Francisco	Treasuries (Long Duration)		383,285,368					383,285,368	1.15%
	Treasuries (Long Duration) Total							\$383,285,368	1.15%
									0.00%
Operating Cash (assetized)	US Treasuries		124,456,355					124,456,355	0.37%
ASRS: Phoenix	Enhanced Passive F2		1,878,655,560					1,878,655,560	5.63%
Blackrock: San Francisco	Passive (US Debt Index)		1,598,851,129					1,598,851,129	4.79%
	Core Fixed Income Total							\$3,601,963,045	10.80%
	Interest Rate Sensitive							\$3,985,248,413	11.94%
									11.00%
Columbia: Minneapolis	Active	708,895,771						708,895,771	2.12%
JP Morgan: Indianapolis	Active	362,038,935						362,038,935	1.09%
	High Yield Fixed Income Total							\$1,070,948,473	3.21%
									4.00%
	Opportunistic Debt	1,076,649,725						\$1,076,649,725	3.23%
									0.00%
	Private Debt Total	2,641,141,748						\$2,641,141,748	7.92%
									10.00%
	Fixed Income Total							\$8,773,988,360	26.30%
									25.00%
LSV: Chicago	Active (Value)			564,944,557				564,944,557	1.69%
ASRS: Phoenix	Passive E2			4,483,347,626				4,483,347,626	13.44%
ASRS: Phoenix	Enhanced Passive E7			567,644,107				567,644,107	1.70%
Operating Cash (assetized)	S&P 500			215,724,349				215,724,349	0.65%
ASRS: Phoenix	Enhanced Passive E8			543,950,552				543,950,552	1.63%
	Large Cap Equity Total							\$6,375,611,624	19.11%
									20.00%
Wellington: Boston	Active (Core)			283,375,065				283,375,065	0.85%
ASRS: Phoenix	Passive E3 (Growth)			402,721,152				402,721,152	1.21%
Operating Cash (assetized)	Russell 2000			37,336,907				37,336,907	0.11%
ASRS: Phoenix	Passive E4 (Value)			373,767,983				373,767,983	1.12%
	Mid Cap Equity Total							\$1,097,201,107	3.29%
									3.00%
TimesSquare: New York	Active (Growth)			358,449,236				358,449,236	1.07%
Operating Cash (assetized)	Russell 2000			37,336,907				37,336,907	0.11%
DFA: Santa Monica	Active (Value)			277,228,950				277,228,950	0.83%
ASRS: Phoenix	Passive E6			327,082,904				327,082,904	0.98%
	Small Cap Equity Total							\$1,000,097,998	3.00%
									3.00%
	U.S. Equity Total							\$8,472,910,729	25.39%
									26.00%
Brandes: San Diego	Active (Value)			560,548,800				560,548,800	1.68%
American Century	Active (EAFE)			550,205,620				550,205,620	1.65%
Trinity Street	Active (EAFE)			325,037,872				325,037,872	0.97%
Thompson Siegel Walmsley	Active (EAFE)			295,419,682				295,419,682	0.89%
Int'l Transition					4,842,077			4,842,077	0.01%
Blackrock: San Francisco	Passive (EAFE)				3,974,702,191			3,974,702,191	11.91%
	Large Cap Developed Non-US Equity Total							\$5,711,262,484	17.12%
									17.00%
AQR: Greenwich	Active (EAFE SC)			99,349,745				99,349,745	0.30%
DFA: Santa Monica	Active (EAFE SC)			104,530,631				104,530,631	0.31%
Franklin Templeton: San Mateo	Active (EAFE SC)			221,445,920				221,445,920	0.66%
Blackrock: San Francisco	Passive (EAFE SC)				259,439,533			259,439,533	0.78%
	Small Cap Developed Non-US Equity Total							\$684,768,283	2.05%
									2.00%
	Small Cap Developed Policy								2.00%

Asset Allocation (Continued)

Pension (Plan, System, HBS Assets)		ASRS Market Value Report					Tuesday, May 31, 2016		
Account Manager	Account Manager Style	Fixed Income		Equity		Inflation Linked	Multi-Asset	Total	Pct of Fund
		Active	Enh/Passive	Active	Enh/Passive	Active	Active		
William Blair: Chicago	Active (EM)			350,939,423				350,939,423	1.05%
Eaton Vance: Boston	Active (EM)			255,135,420				255,135,420	0.76%
LSV: Chicago	Active (EM)			109,672,032				109,672,032	0.33%
Blackrock: San Francisco	Passive (EM)				306,100,857			306,100,857	0.92%
	Emerging Markets Equity Total							\$1,021,847,732	3.06%
	Emerging Markets Policy								5.00%
	Non-US Equity Total							\$7,417,878,498	22.23%
	Non-US Equity Policy Range: 14% - 34%								24.00%
ASRS: Phoenix	Risk Factor Portfolio				578,758,380			578,758,380	1.73%
	Public Equity Total							\$16,469,547,606	49.36%
	Private Equity Total			2,725,561,527				\$2,725,561,527	8.17%
	Private Equity Policy Range: 6% - 10%								8.00%
	Opportunistic Equity			324,050,179				\$324,050,179	0.97%
	Opportunistic Equity Policy:								0.00%
	Equity Total							\$19,519,159,312	58.50%
	Total Equity Policy Range: 48% - 65%								58.00%
Gresham: New York	Commodities Total					224,244,845		224,244,845	0.67%
	Commodities Policy Range: 0% - 4%								2.00%
	Real Estate Total					3,284,339,897		\$3,284,339,897	9.84%
	Real Estate Policy Range: 8% - 12%								10.00%
	Infrastructure Total					325,444,191		\$325,444,191	0.98%
	Infrastructure Policy Range: 0% - 3%								0.00%
	Farmland & Timber Total					188,017,561		\$188,017,561	0.56%
	Farmland & Timber Policy Range: 0% - 3%								0.00%
	Inflation Linked Total							\$4,022,046,494	12.05%
	Inflation Linked Policy Range: 10% - 16%								12.00%
Bridgewater	Multi-Asset Class Strategies						1,039,005,367	1,039,005,367	3.11%
	Multi-Asset Class Policy Range: 0% - 12%								5.00%
	TOTAL Amounts	\$4,788,739,947	\$3,996,004,669	\$7,406,403,356	\$12,112,755,956	\$4,022,046,494	\$1,039,005,367	\$33,364,955,789	Total Fund
	TOTAL Percent	14.35%	11.98%	22.20%	36.30%	12.05%	3.11%		

Asset Allocation Summary

Pension (Plan, System, HBS Assets) ASRS Market Value Report Tuesday, May 31, 2016

Asset Class	Actual Portfolio	SAAP Target (Range)	Interim SAA* Adj Policy	Actual - Interim SAA** % diff	Actual - Interim SAA** \$ diff	Policy Band check Actual - Adj Policy
Tactical Cash	0.00%	0% (0-3%)	0.00%	0.00%		
Cash	0.03%	0.00%	0.00%	0.03%	10,756,256	
Interest Rate Sensitive	11.94%	11%	12.58%	-0.63%		
High Yield	3.21%	4%	4.56%	-1.35%		
Opportunistic Debt	3.23%	0%	0.00%	3.23%	\$1,076,649,725	
Private Debt	7.92%	10% (8-12%)	7.92% (6-10%)	0.00%		
Total Fixed Income	26.30%	25% (18-35%)	25.05% (18-35%)	1.25%	\$417,102,708	OK
Large Cap	19.11%	20%	18.38%	0.73%	\$241,912,970	
Mid Cap	3.29%	3%	2.77%	0.51%	\$171,742,657	
Small Cap	3.00%	3%	3.00%	0.00%	-\$850,676	
US Equity	25.39%	26% (16-36%)	24.16% (14-34%)	1.24%	\$412,804,951	OK
Developed Large Cap	17.12%	17%	17.05%	0.07%	\$24,094,851	
Developed Small Cap	2.05%	2%	2.00%	0.05%	\$17,469,167	
Emerging Markets	3.06%	5%	5.00%	-1.94%	-\$646,400,058	
Non-US Equity	22.23%	24% (14-34%)	24.05% (14-34%)	-1.81%	-\$604,836,039	OK
Risk Factors	1.73%	0%	1.73%	0.00%		
Private Equity	8.17%	8% (6-10%)	8.17%	0.00%	\$0	OK
Opportunistic Equity	0.97%	0%	0.00%	0.97%	\$324,050,179	
Total Equity	58.50%	58% (48-65%)	58.11% (48-65%)	0.40%	\$132,019,090	OK
Commodities	0.67%	2% (0-4%)	2.00%	-1.33%	-\$444,097,384	OK
Real Estate	9.84%	10% (8-12%)	9.84%	0.00%	\$0	OK
Infrastructure	0.98%	0% (0-3%)	0.00%	0.98%	\$325,444,191	OK
Farmland & Timber	0.56%	0% (0-3%)	0.00%	0.56%	\$188,017,561	OK
Opportunistic I/L	0.00%	0%	0.00%	0.00%	\$0	
Total Inflation Linked	12.05%	12% (10-16%)	11.85% (10-14%)	0.21%	\$69,364,368	OK
Multi-Asset Strategies***	3.11%	5% (0-12%)	5% (0-12%)	-1.89%	-\$629,242,422	OK
Total	100.00%	100%	100.00%	0.00%	\$0	

Internally Managed Portfolios:	
\$8,577,169,885	26%

*Interim SAA includes a proration of unfunded Private Equity, Private Debt, and Real Estate
**Private Equity is prorated to domestic equity; Real Estate is prorated to equity, commodities, and fixed income; Private Debt is prorated to Interest Rate Sensitive and High Yield

Opportunistic definitions:
An investment in a category that is not included in the ASRS Asset Allocation policy and represents an investment opportunity that is tactical in nature.
Opportunistic investments have a 0% target (0%-10% range), regardless of asset class.

Total Opportunistic		
Opportunistic Debt	\$1,076,649,725	3.2%
Opportunistic Equity	\$324,050,179	1.0%
Opportunistic I/L	\$0	0.0%
	\$1,400,699,904	4.2%

Total Public Equity Returns as of April 30, 2016

Arizona State Retirement System

Total Domestic and International Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Domestic and International Equity	16,941,257,961	50.09	1.55	8.39	-2.18	-3.78	6.70	6.82	5.26	6.34	Jan-98
ASRS Custom Total Equity Benchmark			1.43	8.51	-2.74	-4.58	6.59	6.86	5.48	5.71	Jan-98
Over/Under			0.12	-0.12	0.56	0.80	0.11	-0.04	-0.22	0.63	
Equity Risk Factor Portfolio	568,470,283	1.68	0.08	6.90	1.87	2.21	--	--	--	11.09	Jun-13
ASRS Custom Total Equity Benchmark			1.43	8.51	-2.74	-4.58	6.59	6.86	5.48	6.57	Jun-13
Over/Under (vs. Net)			-1.35	-1.61	4.61	6.79				4.52	
Total Domestic and Int'l Equity ex-Equity Risk Factor Portfolio	16,372,787,677	48.41	1.60	8.44	-2.30	-3.96	6.58	6.75	5.23	6.32	Jan-98
ASRS Custom Total Equity Benchmark			1.43	8.51	-2.74	-4.58	6.59	6.86	5.48	5.71	Jan-98
Over/Under			0.17	-0.07	0.44	0.62	-0.01	-0.11	-0.25	0.61	

1. Total Domestic and International Equity market value includes \$772,987,554 remaining in terminated manager and transition accounts.

2. Performance of ASRS Total Domestic and International 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. 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 is based on net of fee performance data.

Composition of ASRS Custom Total Equity Benchmark can be found in the appendix.



NEPC, LLC

April 30, 2016

Domestic Equity Returns as of April 30, 2016

Arizona State Retirement System

Domestic and Large Cap Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Domestic Equity	8,105,489,684	23.96	0.65	8.06	1.33	0.95	10.90	10.47	7.30	11.09	Jul-75
ASRS Custom Domestic Equity Benchmark			0.57	7.96	1.06	0.88	11.13	10.72	7.33	11.16	Jul-75
Over/Under			0.08	0.10	0.27	0.07	-0.23	-0.25	-0.03	-0.07	
Total Large Cap Equity	6,109,864,712	18.06	0.38	7.26	2.75	1.85	11.10	10.81	6.94	7.72	Jul-02
S&P 500			0.39	7.05	1.89	1.21	11.26	11.02	6.91	7.63	Jul-02
Over/Under			-0.01	0.21	0.86	0.64	-0.16	-0.21	0.03	0.09	
Active Large Cap Equity											
LSV	560,602,450	1.66	1.10	8.67	-3.35	-4.03	10.18	10.29	6.60	10.26	Jan-03
S&P/Citigroup 500 Value			2.11	9.71	1.54	0.28	9.56	9.90	5.35	8.48	Jan-03
Over/Under			-1.01	-1.04	-4.89	-4.31	0.62	0.39	1.25	1.78	
Enhanced/Passive Large Cap Equity											
Internally Managed E2	4,447,875,446	13.15	0.39	7.07	1.90	1.19	11.22	11.00	6.95	7.44	Apr-97
S&P 500			0.39	7.05	1.89	1.21	11.26	11.02	6.91	7.38	Apr-97
Over/Under (vs. Net)			0.00	0.02	0.01	-0.02	-0.04	-0.02	0.04	0.06	
Internally Managed E7	562,700,285	1.66	0.33	7.80	9.22	6.08	10.84	--	--	13.12	Aug-12
MSCI USA High Dividend Yield Index			0.33	7.79	9.45	6.26	10.86	12.30	8.40	13.15	Aug-12
Over/Under (vs. Net)			0.00	0.01	-0.23	-0.18	-0.02	--	--	-0.03	
Internally Managed E8	538,686,532	1.59	-0.52	6.62	10.24	8.94	11.83	--	--	14.06	Aug-12
MSCI USA Minimum Volatility Index			-0.45	6.69	10.42	9.12	11.67	13.37	8.73	13.75	Aug-12
Over/Under (vs. Net)			-0.07	-0.07	-0.18	-0.18	0.16	--	--	0.31	

1. Total Domestic Equity includes \$431 in terminated manager and transition accounts

2. In mid-December, 2005 the S&P/Citigroup style indices replaced the S&P/Barra style indices. Returns are a blend of S&P/Barra indices prior to mid-December 2005 and S&P/Citigroup indices going forward.

Note: Performance is reported net of fees.

Domestic Equity Returns as of April 30, 2016

Arizona State Retirement System

Mid Cap Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Mid Cap Equity	1,043,381,404	3.08	1.16	11.05	-1.79	-1.29	9.99	9.12	7.70	9.73	Jul-02
S&P 400 MidCap			1.22	11.39	-1.37	-0.94	9.67	9.20	7.76	9.74	Jul-02
Over/Under			-0.06	-0.34	-0.42	-0.35	0.32	-0.08	-0.06	-0.01	
Active Mid Cap Equity											
Wellington	275,241,334	0.81	1.01	10.45	-2.32	-1.73	11.53	9.65	8.42	10.70	Jul-02
S&P 400 MidCap			1.22	11.39	-1.37	-0.94	9.67	9.20	7.76	9.74	Jul-02
Over/Under			-0.21	-0.94	-0.95	-0.79	1.86	0.45	0.66	0.96	
Passive Mid Cap Equity											
Internally Managed E3	396,862,135	1.17	0.72	8.38	-2.47	-0.83	9.39	8.83	8.86	8.24	Dec-00
S&P/Citigroup 400 Growth			0.68	8.25	-2.39	-0.77	9.38	8.70	8.34	7.74	Dec-00
Over/Under (vs. Net)			0.04	0.13	-0.08	-0.06	0.01	0.13	0.52	0.50	
Internally Managed E4	371,277,935	1.10	1.73	14.52	-0.73	-1.54	9.71	9.53	7.36	9.81	Jul-02
S&P/Citigroup 400 Value			1.72	14.55	-0.62	-1.45	9.79	9.62	7.10	9.64	Jul-02
Over/Under (vs. Net)			0.01	-0.03	-0.11	-0.09	-0.08	-0.09	0.26	0.17	

1. In mid-December, 2005 the S&P/Citigroup style indices replaced the S&P/Barra style indices. Returns are a blend of S&P/Barra indices prior to mid-December 2005 and S&P/Citigroup indices going forward.

Note: Performance is reported net of fees.



NEPC, LLC

April 30, 2016

Domestic Equity Returns as of April 30, 2016

Arizona State Retirement System

Small Cap Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Small Cap Equity	952,243,136	2.82	1.62	10.30	-5.92	-3.65	9.29	9.19	7.24	9.79	Jul-02
ASRS Custom Small Cap Equity Blended Benchmark			<u>1.17</u>	<u>10.69</u>	<u>-2.25</u>	<u>0.26</u>	<u>10.91</u>	<u>10.10</u>	<u>7.31</u>	<u>9.49</u>	Jul-02
Over/Under			0.45	-0.39	-3.67	-3.91	-1.62	-0.91	-0.07	0.30	
Active Small/Mid Cap Equity											
TimesSquare	350,867,647	1.04	2.65	8.78	-9.34	-5.95	8.80	9.86	9.14	10.80	Apr-05
Times Square Blended Benchmark			<u>1.00</u>	<u>7.97</u>	<u>-12.69</u>	<u>-8.27</u>	<u>8.55</u>	<u>7.69</u>	<u>6.80</u>	<u>8.41</u>	Apr-05
Over/Under			1.65	0.81	3.35	2.32	0.25	2.17	2.34	2.39	
Active Small Cap Equity											
DFA - US Small Cap	275,260,487	0.81	1.26	12.30	-5.45	-4.88	8.52	8.16	6.28	11.15	Sep-98
DFA Blended Benchmark			<u>2.08</u>	<u>14.08</u>	<u>-0.56</u>	<u>0.72</u>	<u>10.52</u>	<u>10.34</u>	<u>6.89</u>	<u>10.49</u>	Sep-98
Over/Under			-0.82	-1.78	-4.89	-5.60	-2.00	-2.18	-0.61	0.66	
Passive Small Cap Equity											
Internally Managed E6	326,115,002	0.96	0.83	10.29	-2.42	0.12	10.82	9.99	--	7.52	Feb-07
S&P 600 SmallCap			<u>1.17</u>	<u>10.69</u>	<u>-2.25</u>	<u>0.26</u>	<u>10.91</u>	<u>10.10</u>	<u>7.12</u>	<u>7.24</u>	Feb-07
Over/Under (vs. Net)			-0.34	-0.40	-0.17	-0.14	-0.09	-0.11		0.28	

Note: Performance is reported net of fees.

Composition of ASRS Custom Small Cap Equity Blended Benchmark, Times Square Blended Benchmark and DFA Blended Benchmark can be found in the appendix.



April 30, 2016

International Equity Returns as of April 30, 2016

Arizona State Retirement System

International and International Developed Markets Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total International Equity	8,267,297,993	24.44	2.48	8.59	-6.68	-9.66	0.67	0.69	1.70	5.77	Apr-87
ASRS Custom Int'l Equity Benchmark			2.35	9.10	-6.80	-10.29	0.63	0.74	2.39	5.47	Apr-87
Over/Under			0.13	-0.51	0.12	0.63	0.04	-0.05	-0.69	0.30	
Total International Developed Markets Equity	6,427,725,125	19.00	2.70	7.86	-5.26	-7.43	2.40	2.31	2.73	6.14	Apr-87
ASRS Custom Int'l Developed Markets Equity Benchmark			2.83	7.89	-5.40	-8.23	2.24	2.38	3.28	5.78	Apr-87
Over/Under			-0.13	-0.03	0.14	0.80	0.16	-0.07	-0.55	0.36	
Active Large Cap International Equity											
Brandes	569,331,416	1.68	2.74	7.27	-5.47	-7.36	4.29	3.08	2.15	8.39	Oct-98
Brandes Custom Benchmark			2.90	7.58	-6.19	-9.32	1.55	1.94	2.87	5.55	Oct-98
Over/Under			-0.16	-0.31	0.72	1.96	2.74	1.14	-0.72	2.84	
American Century	547,771,639	1.62	1.57	5.10	-6.00	-7.03	--	--	--	-3.56	Jul-14
MSCI EAFE			2.90	7.58	-6.19	-9.32	1.48	1.69	1.61	-5.67	Jul-14
Over/Under			-1.33	-2.48	0.19	2.29	--	--	--	2.11	
Trinity Street	327,195,364	0.97	3.20	9.70	-3.45	-4.99	--	--	--	-3.79	Jul-14
MSCI EAFE			2.90	7.58	-6.19	-9.32	1.48	1.69	1.61	-5.67	Jul-14
Over/Under			0.30	2.12	2.74	4.33	--	--	--	1.88	
TS&W International	297,798,995	0.88	2.27	8.07	-4.45	-7.52	--	--	--	-3.69	Jul-14
MSCI EAFE			2.90	7.58	-6.19	-9.32	1.48	1.69	1.61	-5.67	Jul-14
Over/Under			-0.63	0.49	1.74	1.80	--	--	--	1.98	

1. Total International Equity market value includes \$772,987,122 in terminated manager and transition accounts.

2. Total International Developed Markets Equity market value includes \$185,557 in terminated manager accounts.

3. American Century, Trinity Street and TS&W were funded in mid-June 2014. Inception date for performance reporting purposes is July 1, 2014.

Note: Performance is reported net of fees.

Composition of ASRS Custom Int'l Equity Benchmark, ASRS Custom Int'l Developed Markets Equity Benchmark, and Brandes Custom Benchmark can be found in the appendix.



NEPC, LLC

April 30, 2016

International Equity Returns as of April 30, 2016

Arizona State Retirement System

International and International Developed Markets Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Passive Large Cap International Equity											
BlackRock EAFE Equity Index	4,003,347,771	11.84	2.98	7.79	-5.99	-9.04	1.74	1.98	--	7.11	Jul-09
MSCI EAFE			2.90	7.58	-6.19	-9.32	1.55	1.94	1.98	7.09	Jul-09
Over/Under			0.08	0.21	0.20	0.28	0.19	0.04		0.02	
Active Small Cap International Equity											
DFA - International Small Cap	105,977,464	0.31	4.35	12.71	-3.64	-4.07	4.57	2.67	2.83	5.01	Sep-05
MSCI EAFE Small Cap			2.30	10.37	1.17	0.94	6.90	5.16	3.51	5.84	Sep-05
Over/Under			2.05	2.34	-4.81	-5.01	-2.33	-2.49	-0.68	-0.83	
Franklin Templeton	218,888,936	0.65	0.83	9.51	-3.96	-3.21	4.74	5.34	--	6.41	Apr-11
MSCI EAFE Small Cap			2.30	10.37	1.17	0.94	6.90	5.16	3.51	6.15	Apr-11
Over/Under			-1.47	-0.86	-5.13	-4.15	-2.16	0.18		0.26	
AQR Capital	98,285,691	0.29	0.81	7.77	1.28	1.89	--	--	--	9.06	Jun-13
MSCI EAFE Small Cap			2.30	10.37	1.17	0.94	6.90	5.16	3.51	7.95	Jun-13
Over/Under			-1.49	-2.60	0.11	0.95				1.11	
Passive Small Cap International Equity											
BlackRock EAFE Small Cap Equity Index	258,939,767	0.77	2.34	10.49	1.29	1.04	6.97	5.05	--	10.64	Jun-10
MSCI EAFE Small Cap			2.30	10.37	1.17	0.94	6.90	5.16	3.51	10.72	Jun-10
Over/Under			0.04	0.12	0.12	0.10	0.07	-0.11		-0.08	

Note: Performance is reported net of fees.



April 30, 2016

International Equity Returns as of April 30, 2016

Arizona State Retirement System

International Emerging Markets Equity Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total International Emerging Markets Equity	1,066,773,829	3.15	1.08	13.11	-12.35	-17.77	-4.41	-3.88	--	-1.76	Oct-10
<i>MSCI Emerging Markets</i>			<u>0.54</u>	<u>13.66</u>	<u>-12.16</u>	<u>-17.87</u>	<u>-4.49</u>	<u>-4.43</u>	<u>2.61</u>	<u>-1.85</u>	<u>Oct-10</u>
Over/Under			0.54	-0.55	-0.19	0.10	0.08	0.55	--	0.09	
Active Emerging Markets Equity											
Eaton Vance	279,833,965	0.83	2.48	15.69	-7.93	-12.92	-3.90	-3.66	--	-1.47	Dec-10
<i>MSCI Emerging Markets</i>			<u>0.54</u>	<u>13.66</u>	<u>-12.16</u>	<u>-17.87</u>	<u>-4.49</u>	<u>-4.43</u>	<u>2.61</u>	<u>-1.94</u>	<u>Dec-10</u>
Over/Under			1.94	2.03	4.23	4.95	0.59	0.77	--	0.47	
LSV Emerging Market	115,237,808	0.34	0.81	14.62	-15.52	-22.46	-6.15	-5.00	--	-2.12	Dec-10
<i>MSCI Emerging Markets</i>			<u>0.54</u>	<u>13.66</u>	<u>-12.16</u>	<u>-17.87</u>	<u>-4.49</u>	<u>-4.43</u>	<u>2.61</u>	<u>-1.94</u>	<u>Dec-10</u>
Over/Under			0.27	0.96	-3.36	-4.59	-1.66	-0.57	--	-0.18	
William Blair	353,911,459	1.05	0.58	10.30	-14.19	-18.58	-3.08	-1.46	--	-0.46	Nov-10
<i>MSCI Emerging Markets</i>			<u>0.54</u>	<u>13.66</u>	<u>-12.16</u>	<u>-17.87</u>	<u>-4.49</u>	<u>-4.43</u>	<u>2.61</u>	<u>-2.39</u>	<u>Nov-10</u>
Over/Under			0.04	-3.36	-2.03	-0.71	1.41	2.97	--	1.93	
Passive Emerging Markets Equity											
BlackRock Emerging Markets Equity Index	317,790,596	0.94	0.51	13.56	-12.31	-18.06	-4.76	-4.81	--	-2.22	Oct-10
<i>MSCI Emerging Markets</i>			<u>0.54</u>	<u>13.66</u>	<u>-12.16</u>	<u>-17.87</u>	<u>-4.49</u>	<u>-4.43</u>	<u>2.61</u>	<u>-1.85</u>	<u>Oct-10</u>
Over/Under			-0.03	-0.10	-0.15	-0.19	-0.27	-0.38	--	-0.37	

Note: Performance is reported net of fees.



April 30, 2016

Fixed Income and Commodity Returns as of April 30, 2016

Arizona State Retirement System

Fixed Income and Interest Rate Sensitive Fixed Income Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Public Markets Fixed Income	4,944,833,200	14.62	0.80	3.00	3.78	2.50	1.27	3.51	5.14	8.25	Jul-75
ASRS Custom Public Markets Fixed Income Benchmark			1.34	3.93	3.06	1.73	0.75	2.99	4.68	--	Jul-75
Over/Under			-0.54	-0.93	0.72	0.77	0.52	0.52	0.46		
Total Interest Rate Sensitive Fixed Income	3,878,154,654	11.47	0.28	2.02	4.48	3.13	2.55	3.78	5.17	8.25	Jul-75
Barclays Aggregate			0.38	2.02	4.10	2.72	2.29	3.60	4.95	--	Jul-75
Over/Under			-0.10	0.00	0.38	0.41	0.26	0.18	0.22		
Long Duration Fixed Income											
BlackRock Long Gov't Bond Index	380,346,620	1.12	-0.45	2.57	--	--	--	--	--	7.84	Sep-15
Barclays U.S. Treasury Long TR USD			-0.50	2.46	11.52	5.54	4.58	9.15	8.13	7.76	Sep-15
Over/Under			0.05	0.11						0.08	
Enhanced Passive Core Fixed Income											
BlackRock US Debt Index	1,599,299,306	4.73	0.40	2.01	4.20	2.76	--	--	--	3.74	May-14
Barclays Aggregate			0.38	2.02	4.10	2.72	2.29	3.60	4.95	3.59	May-14
Over/Under			0.02	-0.01	0.10	0.04				0.15	
Internally Managed F2	1,898,508,727	5.61	0.33	1.94	4.23	2.98	2.61	3.86	5.21	5.44	Oct-00
Barclays Aggregate			0.38	2.02	4.10	2.72	2.29	3.60	4.95	5.28	Oct-00
Over/Under (vs. Net)			-0.05	-0.08	0.13	0.26	0.32	0.26	0.26	0.16	

1. Total Public Markets Fixed Income market value includes \$13,766 remaining in terminated manager accounts.
2. BlackRock Long Gov't Bond Index was funded in mid-August 2015. Inception date for performance reporting purposes is September 1, 2015.
3. BlackRock US Debt Index was funded in mid-April 2014. Inception date for performance reporting purposes is May 1, 2014.

Note: Performance is reported net of fees.

Composition of ASRS Custom Public Markets Fixed Income Benchmark can be found in the appendix.



April 30, 2016

Fixed Income and Commodity Returns as of April 30, 2016

Arizona State Retirement System

Total High Yield Fixed Income Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total High Yield Fixed Income	1,066,678,547	3.15	2.75	6.75	1.63	0.56	3.31	5.74	--	7.96	Oct-09
Barclays High Yield			3.92	9.15	0.07	-1.12	2.54	5.41	7.35	8.19	Oct-09
Over/Under			-1.17	-2.40	1.56	1.68	0.77	0.33		-0.23	
Active High Yield Fixed Income											
Columbia Management	707,475,471	2.09	2.36	6.20	2.72	1.48	3.73	6.22	--	8.44	Oct-09
Barclays High Yield			3.92	9.15	0.07	-1.12	2.54	5.41	7.35	8.19	Oct-09
Over/Under			-1.56	-2.95	2.65	2.60	1.19	0.81		0.25	
JP Morgan High Yield	359,189,311	1.06	3.51	7.84	-0.34	-1.15	--	--	--	3.85	Jul-13
Barclays High Yield			3.92	9.15	0.07	-1.12	2.54	5.41	7.35	3.87	Jul-13
Over/Under			-0.41	-1.31	-0.41	-0.03				-0.02	

1. Total High Yield Fixed Income includes \$13,765 in terminated manager and transition accounts.
 Note: Performance is reported net of fees.

Fixed Income and Commodity Returns as of April 30, 2016

Arizona State Retirement System

Inflation-Linked Assets Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Inflation-Linked Assets	223,607,319	0.66	8.02	11.03	-18.70	-20.57	-13.69	-12.24	--	-6.16	Feb-10
ASRS Custom Inflation-Linked Benchmark			<u>8.51</u>	<u>10.83</u>	<u>-16.60</u>	<u>-17.45</u>	<u>-13.76</u>	<u>-13.03</u>	<u>-2.12</u>	<u>-6.98</u>	<u>Feb-10</u>
Over/Under			-0.49	0.20	-2.10	-3.12	0.07	0.79		0.82	
Total Commodities	223,607,319	0.66	8.02	11.03	-18.70	-20.57	-13.69	-12.66	--	-6.45	Sep-10
Bloomberg Commodity Index			<u>8.51</u>	<u>10.83</u>	<u>-16.60</u>	<u>-17.45</u>	<u>-13.76</u>	<u>-13.32</u>	<u>-6.01</u>	<u>-7.15</u>	<u>Sep-10</u>
Over/Under			-0.49	0.20	-2.10	-3.12	0.07	0.66		0.70	
Gresham	223,607,319	0.66	8.02	11.03	-18.70	-20.57	-13.66	-12.43	--	-5.85	Sep-10
Bloomberg Commodity Index			<u>8.51</u>	<u>10.83</u>	<u>-16.60</u>	<u>-17.45</u>	<u>-13.76</u>	<u>-13.32</u>	<u>-6.01</u>	<u>-7.15</u>	<u>Sep-10</u>
Over/Under			-0.49	0.20	-2.10	-3.12	0.10	0.89		1.30	

Note: Performance is reported net of fees.
 Composition of ASRS Custom Inflation-Linked Benchmark can be found in the appendix.

Multi-Asset Class Returns as of April 30, 2016

Arizona State Retirement System

Multi-Asset Class Strategies Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Multi-Asset Class Strategies	1,042,417,566	3.08	-1.09	-6.09	-10.07	-11.66	2.50	4.51	5.73	6.45	Jan-04
<i>Multi-Asset Class Strategies Custom Benchmark</i>			<i>0.02</i>	<i>0.06</i>	<i>-0.95</i>	<i>-1.82</i>	<i>4.87</i>	<i>5.91</i>	<i>5.02</i>	<i>5.81</i>	<i>Jan-04</i>
Over/Under			-1.11	-6.15	-9.12	-9.84	-2.37	-1.40	0.71	0.64	
Bridgewater	1,042,417,566	3.08	-1.09	-6.09	-8.57	-9.96	3.82	5.84	6.95	7.58	Jan-04
<i>ASRS Bridgewater Custom Benchmark</i>			<i>0.02</i>	<i>0.06</i>	<i>0.10</i>	<i>0.10</i>	<i>5.44</i>	<i>6.25</i>	<i>5.19</i>	<i>5.95</i>	<i>Jan-04</i>
Over/Under			-1.11	-6.15	-8.67	-10.06	-1.62	-0.41	1.76	1.63	

Note: Performance is reported net of fees.

Composition of Multi-Asset Class Strategies Custom Benchmark and ASRS Bridgewater Custom Benchmark can be found in the appendix.

Private Markets Returns

Returns as of December 31, 2015

	Benchmark	Portfolio Return	Benchmark Return	Excess Return
Private Equity	Russell 2000	11.01	9.66	1.35
Private Real Estate	ODCE Net	8.14	7.01	1.13
Private Opportunistic Equity	Absolute Eight	23.06	8.00	15.06
Opportunistic Fixed Income	Absolute Eight	9.32	8.00	1.32
Private Debt	Lev Loan+250	10.87	3.34	7.53
Farmland	Core CPI+350	4.71	5.50	-0.79

LTD Plan

Long Term Disability (LTD)

Tuesday, May 31, 2016

Account Manager	Account Manager Style	Fixed Income	Equity	Inflation Linked	Total	Pct of Fund	Target (Range)
StateStreet B&T: Boston	Cash	\$ 2,154,838			\$2,154,838	1.08%	
BlackRock: San Francisco	Fixed Core (Passive)	\$37,309,764			\$37,309,764	18.73%	19%
BlackRock: San Francisco	Fixed High Yield (Passive)	\$15,079,506			\$15,079,506	7.57%	7%
BlackRock: San Francisco	Emerging Market Debt (Passive)	\$123,529			\$123,529	0.06%	0%
						26.36%	26% (19-36%)
BlackRock: San Francisco	Russell 1000 (Passive)		\$45,013,426		\$45,013,426	22.59%	24%
BlackRock: San Francisco	Russell 2000 (Passive)		\$27,802,024		\$27,802,024	13.95%	12%
						36.55%	36% (26-46%)
BlackRock: San Francisco	EAFE (Passive)		\$31,011,509		\$31,011,509	15.57%	18%
BlackRock: San Francisco	EAFE SC (Passive)		\$4,104,436		\$4,104,436	2.06%	2%
BlackRock: San Francisco	Emerging Markets (Passive)		\$10,274,742		\$10,274,742	5.16%	5%
						22.78%	25% (15-35%)
BlackRock: San Francisco	Dow Jones UBS Commodities (Passive)			\$3,186,875	\$3,186,875	1.60%	2% (0-4%)
BlackRock: San Francisco	US Real Estate (Passive)			\$23,171,427	\$23,171,427	11.63%	11% (9-13%)
						13.23%	13% (10-16%)
	TOTAL Amounts	\$54,667,637	\$118,206,137	\$26,358,303	\$199,232,076		
	TOTAL Percent	27.44%	59.33%	13.23%			
	Actual Portfolio	27.44%	59.33%	13.23%			
	Policy	26% (19-36%)	61% (51-68%)	13% (10-16%)			

**Confidential
Meeting
Materials
Removed**

Agenda Item #5

Investment Compliance Reporting

Arizona State Retirement System

Investment Committee

June 20, 2016

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 - Pre-Trade Compliance System
 - Public Markets Portfolios Independent Investment Compliance Program
 - Total Fund Monthly Statutory Investment Compliance
 - Private Markets Investment Compliance

- **State Street Global Services Investment Compliance Review**

- **RCLCO - Real Estate Separate Account Investment Compliance Review**

- **Meketa Investment Group - Commingled Funds & Non-Real Estate Separate Accounts Investment Compliance Review**

Compliance Reporting Overview

Pre-Trade Compliance System.

- For the internally managed portfolios, the Investment Management Division (IMD) utilizes Bloomberg's Trade Order Management System (OMS) for executing and processing trades.
- The OMS platform has built-in pre-trade compliance rules capabilities to ensure trades will not surpass the established portfolio guidelines.
- Compliance rules are based on the investment guidelines:
 - Approved Investment Strategy Papers.
 - Applicable Arizona Revised Statutes.

Compliance Reporting Overview

Public Markets Portfolios Independent Investment Compliance Program.

- State Street provides daily and monthly compliance monitoring at the individual portfolio level, for all the internal and external investment portfolios on a post-trade basis.
- Daily monitoring allows for closer insight into the managers activity.
- The investment compliance rules are based on the investment guidelines:
 - Letters of Direction & Clarification (LODs) for the externally managed portfolios.
 - Investment Strategy Papers for the internally managed portfolios.
 - Applicable Arizona Revised Statutes.

Compliance Reporting Overview

Total Fund Monthly Statutory Investment Compliance.

- State Street Compliance Group provides compliance reporting and monitoring at the Total Fund level, known as the “Monthly Statute Tests Compliance” for:
 - Five mandated Arizona Revised Statutes on investment limits, under §A.R.S. 38-718.H-L.
 1. Max 80% Equity Test (§A.R.S. 38-718.H)
 2. Max 40% Non-US Public Investments Test (§A.R.S. 38-718.I)
 3. Max 60% Internally Managed Assets Test (§A.R.S. 38-718.J)
 4. Max 5% Issuer Test (§A.R.S. 38-718.K)
 5. Max 10% Debt of Multinational Development Banks Test (§A.R.S. 38-718.L)
 - Arizona Restricted Country Test.
 - The test is setup to look at the Fund’s investment’s country of incorporation to identify companies that do business in or with countries currently designated by the United States Department of State as State Sponsors of Terrorism, pursuant to §35-392, Arizona Revised Statutes, as added by Laws 2007, Chapter 201 .
- Per statute requirements, the results are measured using market value.

Compliance Reporting Overview

Private Markets Investment Compliance

RCLCO - Real Estate Separate Accounts.

- Review and note if financial statements are prepared on a fair value basis noting whether liabilities are marked to market or not.
- Review the calculation of ASRS NAV (i.e. the waterfall calculation) and comment to the manager and ASRS if any errors are noted.
- Review the management fee calculation, including review of the NOI calculation to determine if it has been calculated correctly and if appropriate reserves have been deducted, and comment to the manager and ASRS if any errors are noted.
- Work with the manager and ASRS as necessary to address concerns and questions.
- Review audited financial statements at a high level for significant issues.
- Review valuation policies for consistency with ASRS policies, operating agreements and standards.
- Review expense policies for consistency with ASRS policies, operating agreements, and standards.

Compliance Reporting Overview

Private Markets Investment Compliance

Meketa - Commingled Funds & Non-Real Estate Separate Accounts.

- Review managers' calculations of:
 - Asset management fees
 - Partnership expenses
 - Carried interest
- Review investment valuation policy
- Ensure calculation and policy agree to investment documentation, agreements, and manager policies.
- If a deficiency is noted, the consultant will address with the sponsor and work to resolve deficiencies.
- All results are communicated to ASRS.
- A summary report will be presented to the ASRS to communicate findings on an annual basis.

State Street Global Services: Investment Compliance Review

Arizona State
Retirement
System

Arizona State Overview

For background purposes, following is a brief description of the compliance services provided for the ASRS investment portfolios:

Service Overview:

State Street works closely with the Plan to interpret investment guidelines and advise on different monitoring approaches. The compliance specialists will maintain the existing tests and add new tests as requested by the customers. Testing is for the ASRS's portfolios is provided on a daily and monthly basis in a post-trade, pre-settlement environment. This includes:

- Clarification of rules
- Set up and ongoing modification of rules
- Validation and exception research
- Reporting provided daily or monthly.
- Comments and research posted within the Compliance Dashboard (MySS.com)

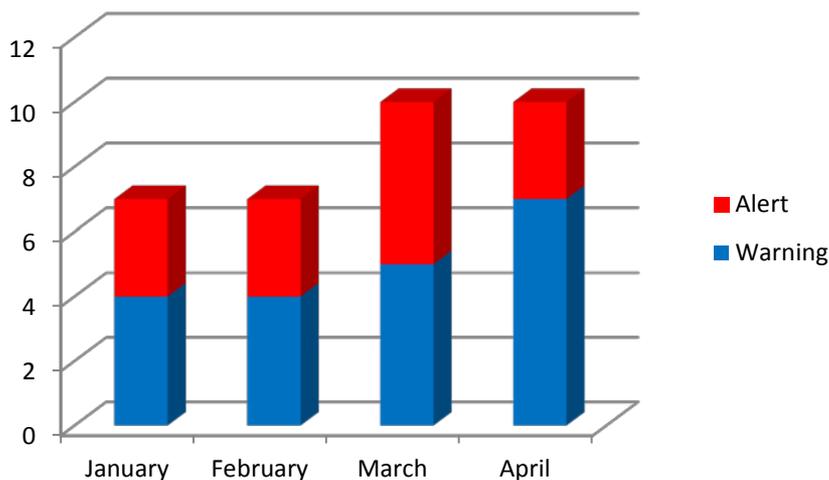
Additional Services:

To satisfy the needs of more sophisticated customers, like Arizona, State Street provides additional assistance with the below:

- Alert validation with Investment Managers
- Quarterly governance meetings

Report Card: Summary & Projects

Total Alerts & Warnings to Date 2016



Alert** : includes compliance rules which are hard limits and /or prohibition according to the Letters of Direction

Warning: includes compliance rules which have been designed as soft notification or flags (informational flag)

Additional Items

- Additional compliance testing and reporting:
 - Downgrades reporting
 - Non – Testable Rules Summary & Testing Coverage
- Explore Additional Applicable Regulatory Testing
- Report Alerts & Warnings by Asset Classes

Breakdown

- January: 3 Alerts – 3 Recurring / 4 Warnings – 4 Recurring
- February: 3 Alerts – 2 New / 4 Warnings – 4 Recurring
- March: 5 Alerts – 4 New / 5 Warnings – 5 Recurring
- April: 3 Alerts – 1 New / 7 Warnings – 7 Recurring

New Alerts**

- January: No New Alerts
- February: 2 New Alerts: A1VF (DIMENSIONAL FUND ADVISORS), A1WV (E6)
 - Allowed securities and Securities contained in Index only
 - Warrants or rights obtained through corporate actions shall be disposed of in an orderly fashion, typically within the quarter in which they were received
- March: 4 New Alert: A1RV (E7 MODEL) , A1RW (E8 MODEL) , A1VE (E2 MODEL), A1VR (E4 MODEL)
 - Allowed securities and Securities contained on Index only
- April: 1 New Alert: A1WE (DIMENSIONAL FUND ADV INTL SC)
 - Warrants or rights obtained through corporate actions shall be disposed of in an orderly fashion, typically within the quarter in which they were received

**** All alerts were researched and resolved to both State Street and Arizona's satisfaction. All alerts have valid responses/actions taken.**

Report Card: Summary & Projects (cont'd)

Arizona Statutes on Investment Limits

Max 80% equity test (Law 38-718 H) –

All Passes

January

72.45% of Market Value

70.27% of Cost

February

72.27% of Market Value

70.37% of Cost

March

73.09% of Market Value

70.19% of Cost

April

73.34% of Market Value

70.73% of Cost

Max 40% foreign investments test (Law 38-718 I) –

All Passes

January

23.16% of Market Value

27.37% of Cost

February

22.86% of Market Value

27.33% of Cost

March

23.07% of Market Value

27.19% of Cost

April

27.54% of Market Value

30.76% of Cost

Max 60% internally managed assets test (Law 38-718 J) – All Passes

January

44.49% of Market Value

37.31% of Cost

February

44.81% of Market Value

37.45% of Cost

March

44.79% of Market Value

37.42% of Cost

April

41.61% of Market Value

34.91% of Cost

Max 5% Issuer test (Law 38-718 K)

January – April Test Result: **Pass**

Max 10% Debt of Multinational Development Banks (Law 38-718 L)

January – April Test Result: **Pass**

Arizona Restricted Country List

As of January 31st, February 29th, March 31st and April 30th, 2016 the Arizona funds were not invested in countries that support terrorism.

2014 Real Estate SMA Compliance Reviews

Prepared for Arizona State Retirement System | Phoenix, Arizona | June 24, 2016

The information contained in this report is confidential, may be legally privileged, and is intended only for the use of the Arizona State Retirement System.

Compliance Review Goals and Objectives

- Ensure financial statements are prepared in accordance with ASRS Reporting Standards and partnership agreement requirements
- Determine if an appropriate valuation policy is in place
 - Ensure that ASRS valuation is properly calculated in accordance with stated policy and the waterfall mechanics of the partnership agreement
- Determine if an appropriate expense policy is in place
 - Confirm that expenses allocated to the account are appropriate and permitted under the partnership agreement
- Ensure fees are calculated correctly and in accordance with the partnership agreement

Compliance Review Process

- Review audited financial statements at a high level for significant issues.
- Review and noted if financial statements were prepared on a fair value basis.
- Review and independently verify the calculation of ASRS net asset value (NAV)
 - Also known as the waterfall calculation or hypothetical liquidation at book value (HLBV)
 - This calculation of NAV reflects the ASRS's net proceeds—after all fees and incentive payments per the terms of the partnership agreement—if all assets were sold
- Review and independently verify the management fee calculation.
- Review valuation policies for consistency with ASRS policies, operating agreements and standards.
- Review expense policies for consistency with ASRS policies, operating agreements and standards.
- Work with the manager and ASRS as necessary to address concerns and questions.
- RCLCO report summarizing each review, including appendices demonstrating the results of the above tasks.

Compliance Review Results

- RCLCO performed compliance reviews on the seven separately managed accounts (SMAs) that had at least one quarter of operations as of December, 31 2014. The results are summarized below:

Manager	Audited Financial Statements	NAV Calculation	Management Fee Calculation	Valuation Policy	Expense Policy
CIM	Compliant	Compliant	Compliant	Compliant	Compliant
Forest City	Compliant	Compliant	Compliant	Compliant	Compliant
JEN	Compliant	Compliant	Compliant	Compliant	Compliant
Pegasus	Compliant	Compliant	Compliant	Compliant	Compliant
Pierce	Compliant	Compliant	Compliant	Compliant	Compliant
USAA	Compliant	Compliant	Compliant	Compliant	Compliant
Ventas	Compliant	Compliant	Compliant	Compliant	Compliant



Asset Management Fee Calculations

- Three managers were noted to have overcharged the respective ventures for asset management fee
 - Pierce incorrectly calculated the portion of the Asset Management Fee based on net operating income (NOI). In particular, Pierce did not account for replacement reserves. As a result, the SMA venture was overcharged by \$16,907. A refund of this amount will be included during the final calculation and audit of the 2015 Asset Management Fee.
 - Forest City erroneously overcharged the SMA venture \$1,564 for Asset Management Fees. Forest City acknowledged the error and will include a refund of the excess fee during the final calculation and audit of the 2015 Asset Management Fee.
 - Pegasus incorrectly calculated the portion of the Asset Management Fee based on net operating income (NOI). In particular, Pegasus did not account for replacement reserves and reserve spending. As a result, the SMA venture was undercharged by \$1,583. This amount will be included with the March 31, 2016 Asset Management Fee payment.
- While each of the issues mentioned above have been addressed by the managers, RCLCO will pay particular attention to these and confirm the corrective actions—including the fee credits—during the 2015 compliance reviews.

Net Asset Value Calculations

- Three managers were noted to have nonmaterial variances in calculated ASRS NAV:
 - JEN allocated net assets based on each Member's proportional commitment. While proportional allocation is permitted under GAAP, ASRS prefers the alternative use of the hypothetical liquidation at book value (HLBV), which approximates the economic substance of the impact of the waterfall calculation on NAV. Under the proportional allocation method the ASRS December 31, 2014 NAV was reported as \$19.9M, while it would have been \$19.8M using the HLBV method, a difference of \$0.1M (0.7%). JEN has committed to utilizing HLBV methodology for future determinations of NAV.
 - Pegasus also allocated net assets based on each Member's proportional commitment. While proportional allocation is permitted under GAAP, ASRS prefers the alternative use of the hypothetical liquidation at book value (HLBV), which approximates the economic substance of the impact of the waterfall calculation on NAV. Additionally, Pegasus's calculation of NAV included allocation of restricted funds which would not actually be distributable upon a hypothetical liquidation. Under the proportional allocation method the ASRS December 31, 2014 NAV was reported as \$54.3M, while it would have been \$53.5M using the HLBV method, a difference of \$0.8M (1.5%). Pegasus has committed to utilizing HLBV methodology for future determinations of NAV.
 - USAA allocated net assets based on Percentage Interest method as it relates to general Partnership purposes and is defined in the Operating Agreement. Instead, the NAV should have been calculated based on the distribution methodology described in the Operating Agreement. Under the Percentage Interest allocation method the ASRS December 31, 2014 NAV was reported as \$46.2M, while it would have been \$47.1M using the HLBV method, a difference of \$0.9M (1.9%).
- Though both JEN and Pegasus reported higher valuations compared to that derived using the ASRS-preferred HLBV methodology, the aggregate variance is completely offset by the lower reported USAA valuation, resulting in no net impact to the overall real estate SMA portfolio valuation.

Conclusion

- Overall, the compliance review process was instructive for the SMA managers, RCLCO, and ASRS.
- All of the SMA managers have created policies that meet operating agreement requirements and ASRS standards.
- The 2014 reviews helped ensure that all parties concur on the calculation of asset management fees and NAV.
- The 2015 compliance review process is underway. Three additional SMAs not reviewed during 2014—Buchanan, L3, and Vestar—will be included in the 2015 reviews. The 2015 review process is expected to conclude in August.

**Meketa Investment Group
Commingled Funds &
Non-Real Estate Separate Accounts
Investment Compliance Review**

Meketa Investment Group - Commingled Funds & Non-Real Estate Separate Accounts Investment Compliance Review.

- Meketa is still in the process of reviewing the 2014 audits from managers.
- 42 funds are being reviewed:
 - 5 Separately Managed Accounts, and
 - 37 Comingled Funds.
- The funds reviewed are 50% of the NAV at 12/31/2014.
- Meketa is scheduled to have the review completed by July 31 and will present their annual report to the committee in August 2016.

Executive Presentation

To: Arizona State Retirement System

truView Risk Report April 30, 2016

Produced by State Street Global Exchange, Risk Services

Monthly Reallocation Summary*

Month Ending March 31, 2016

Portfolio Reductions

- TOTAL EQUITY
 - \$12.4M – E2 (Large Cap)
 - \$1.8M – E7 (Large Cap)
 - \$1.3M – E8 (Large Cap)
 - \$0.5M – INTECH (Large Cap)
 - \$4M – E3 (Mid Cap)
 - \$0.8M – E6 (Small Cap)
- TOTAL CASH
 - \$80M – CASH–ASSETIZED
- **TOTAL REDUCTIONS****
 - **\$100.8M**

Portfolio Additions

- TOTAL CASH
 - \$100.8M – CASH–UNASSETIZED
- **TOTAL ADDITIONS****
 - **\$100.8M**

*Based on State Street accounting records for public markets and therefore exclude private market drawdowns.

**Reductions and additions do not include plan distributions.

Monthly Reallocation Summary*

Month Ending April 30, 2016

Portfolio Reductions

- TOTAL EQUITY
 - \$9.4M – E2 (Large Cap)
 - \$2.4M – E7 (Large Cap)
 - \$1.7M – E8 (Large Cap)
 - \$3.2M – E3 (Mid Cap)
 - \$4.7M – E4 (Mid Cap)
 - \$1.9M – E6 (Small Cap)
- TOTAL FIXED INCOME
 - \$24.9M – BLACKROCK INT GOVT/CREDIT (Core)
 - \$35M – F2 (Core)
- TOTAL OPPORTUNISTIC EQUITY
 - \$97.3M – OPPORTUNISTIC EQUITY
- TOTAL CASH
 - \$95M – CASH-ASSETIZED
- **TOTAL REDUCTIONS****
 - **\$275.5M**

Portfolio Additions

- TOTAL CASH
 - \$275.5M – CASH-UNASSETIZED
- **TOTAL ADDITIONS****
 - **\$275.5M**

*Based on State Street accounting records for public markets and therefore exclude private market drawdowns.

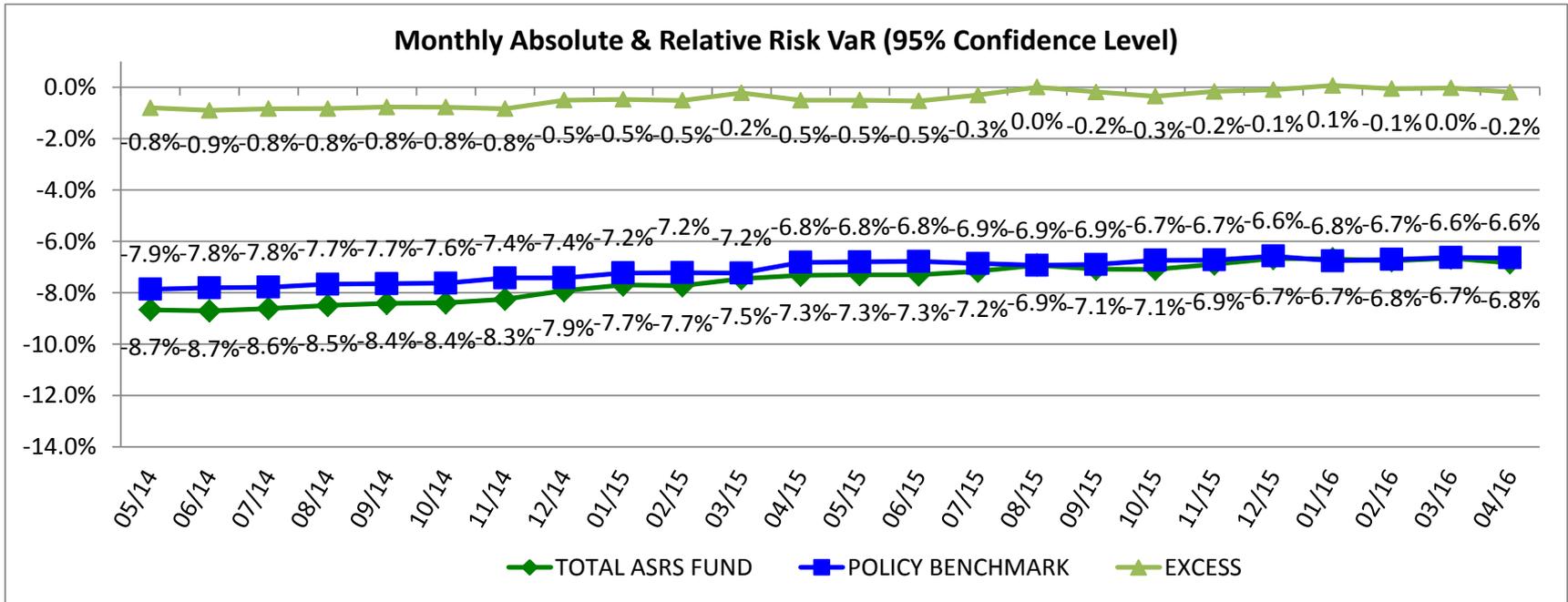
**Reductions and additions do not include plan distributions.

Monthly Risk Summary

Month Ending April 30, 2016

Month-end Risk Profile

- Historical Risk (95% VaR) for most asset classes reported another slight up-tick in risk from prior months. This incremental rise in risk is reflective of the increasingly volatile market. In aggregate, Total Plan risk increased 19bps which was primarily driven by the allocation shift of \$740m from US Equity to International Equity. The Policy Benchmark risk increased 1bps.
- Excess risk over the Policy Benchmark increased to settle at 19bps.



ARIZONA STATE RETIREMENT SYSTEM

TOTAL PLAN EXPOSURE OVERVIEW

As of April 30, 2016

Sector (Public US Equity Only)	\$ Value	% Value	**Blended US BM	Difference
CONSUMER NON-CYCLICAL	\$ 1,952,098,488	22.5%	24.3%	(1.8%)
FINANCIAL	\$ 1,443,631,403	16.7%	17.2%	(0.6%)
TECHNOLOGY	\$ 933,626,287	10.8%	12.2%	(1.4%)
INDUSTRIAL	\$ 879,362,454	10.1%	9.5%	0.6%
CONSUMER CYCLICAL	\$ 873,654,519	10.1%	10.4%	(0.3%)
COMMUNICATIONS	\$ 787,537,547	9.1%	13.1%	(4.0%)
FUNDS	\$ 564,961,524	6.5%	0.0%	6.5%
ENERGY	\$ 544,397,886	6.3%	7.3%	(1.0%)
UTILITIES	\$ 324,919,776	3.7%	3.3%	0.4%
BASIC MATERIALS	\$ 242,465,669	2.8%	2.6%	0.2%
CASH	\$ 87,289,071	1.0%	0.0%	1.0%
GOVERNMENT	\$ 28,012,065	0.3%	0.0%	0.3%
INDEX	\$ 3,921,274	0.0%	0.0%	0.0%
DIVERSIFIED	\$ 1,354,549	0.0%	0.0%	(0.0%)
GRAND TOTAL	\$ 8,667,232,513	100.0%	100.0%	0.0%

Country Category (Total Plan)	\$ Value	% Value	*Blended TOTAL BM	Difference
NORTH AMERICA	\$ 25,279,557,669	75.0%	68.2%	6.8%
EUROPE DEVELOPED	\$ 5,174,760,725	15.3%	16.5%	(1.2%)
ASIA DEVELOPED	\$ 2,067,531,397	6.1%	9.0%	(2.8%)
ASIA EM	\$ 750,793,400	2.2%	4.2%	(2.0%)
LATIN AMERICA	\$ 208,330,321	0.6%	1.2%	(0.6%)
MIDDLE EAST	\$ 98,371,498	0.3%	0.3%	0.0%
AFRICA	\$ 97,940,323	0.3%	0.5%	(0.2%)
EUROPE EM	\$ 48,759,779	0.1%	0.2%	(0.0%)
GRAND TOTAL	\$ 33,726,045,112	100.0%	100.0%	0.0%

Market Cap^ (Public Equities Only)	\$ Value	% Value	*Blended TOTAL BM	Difference
1) 0 - 100M	\$ 1,734,947	0.0%	0.0%	(0.0%)
2) 100M - 500M	\$ 249,219,031	1.5%	1.4%	0.0%
3) 500M - 1B	\$ 393,042,548	2.3%	3.2%	(0.9%)
4) 1B - 5B	\$ 2,583,217,039	15.4%	21.3%	(5.9%)
5) 5B - 10B	\$ 1,848,265,452	11.0%	9.8%	1.2%
6) 10B - 50B	\$ 5,759,149,489	34.3%	30.5%	3.8%
7) >50B	\$ 5,936,365,703	35.4%	33.7%	1.7%
GRAND TOTAL	\$ 16,770,994,209	100.0%	100.0%	0.0%

^Excludes cash and non-traded securities

Top 20 Issuer (Total Plan)	\$ Value	% Value	Market Cap	Sector	Industry Group
1 CASH**	\$ 1,796,162,741	5.3%		CASH	Cash
2 US TREASURY N/B	\$ 1,174,634,718	3.5%		GOVERNMENT	SOVEREIGN
3 FANNIE MAE	\$ 689,699,407	2.1%		MORTGAGE SECURITIES	FNMA COLLATERAL
4 FREDDIE MAC	\$ 241,645,330	0.7%		MORTGAGE SECURITIES	FGLMC COLLATERAL
5 TREASURY BILL	\$ 222,193,726	0.7%		GOVERNMENT	SOVEREIGN
6 ISHARES MSCI USA QUALITY FACTOR E	\$ 159,890,233	0.5%	4) 1B - 5B	FUNDS	EQUITY FUND
7 ISHARES MSCI USA SIZE FACTOR ETF	\$ 150,368,837	0.5%	2) 100M - 500M	FUNDS	EQUITY FUND
8 EXXON MOBIL CORP	\$ 139,817,153	0.4%	7) 50B+	ENERGY	OIL&GAS
9 APPLE INC	\$ 137,742,023	0.4%	7) 50B+	TECHNOLOGY	COMPUTERS
10 ISHARES MSCI USA VALUE FACTOR ETF	\$ 136,341,240	0.4%	3) 500M - 1B	FUNDS	EQUITY FUND
11 JOHNSON & JOHNSON	\$ 134,386,475	0.4%	7) 50B+	CONSUMER NON-CYCLICAL	PHARMACEUTICALS
12 GOVERNMENT NATIONAL MORTGAGE A	\$ 130,602,673	0.4%		MORTGAGE SECURITIES	GNMA2 COLLATERAL
13 MICROSOFT CORP	\$ 130,333,468	0.4%	7) 50B+	TECHNOLOGY	SOFTWARE
14 AT&T INC	\$ 121,484,894	0.4%	7) 50B+	COMMUNICATIONS	TELECOMMUNICATIONS
15 ISHARES MSCI USA MOMENTUM FACTO	\$ 118,361,214	0.4%	4) 1B - 5B	FUNDS	EQUITY FUND
16 NESTLE SA	\$ 111,785,312	0.3%	7) 50B+	CONSUMER NON-CYCLICAL	FOOD
17 ISHARES MSCI EMERGING MARKETS E1	\$ 107,480,459	0.3%	6) 10B - 50B	FUNDS	EQUITY FUND
18 ALPHABET INC	\$ 102,789,368	0.3%	7) 50B+	COMMUNICATIONS	INTERNET
19 ROCHE HOLDING AG	\$ 97,856,397	0.3%	7) 50B+	CONSUMER NON-CYCLICAL	PHARMACEUTICALS
20 JPMORGAN CHASE & CO	\$ 95,388,191	0.3%	7) 50B+	FINANCIAL	BANKS

*Blended TOTAL BM: 23% SP500, 3% SP400, 3% SP600, 7% R2000, 18% MSCI EAFE, 5% MSCI EM, 2% MSCI Sml Cap, 16% BC US AGG, 6% BC US HY, 6% FTSE NAREIT GLOBAL, 2% DJ-UBS COMMODITY, 5% CUSTOM MULTI-ASSET CLASS, 4% S&P/LSTA LEVERED LOAN.

**Blended US BM: 80% SP500, 10% SP400, 10% SP600.

***Cash does not represent an IMD tactical view; Cash includes the ASRS Cash balance, manager-level portfolio cash & equivalents and cash collateralizing sundry portfolio-level futures contracts.

ARIZONA STATE RETIREMENT SYSTEM

As of April 30, 2016

Sector (Public Intl Equity Only)	\$ Value	% Value	*Blended NON-US BM	Difference
CONSUMER NON-CYCLICAL	\$ 1,913,173,978	23.2%	22.2%	0.9%
FINANCIAL	\$ 1,877,168,015	22.7%	24.3%	(1.6%)
CONSUMER CYCLICAL	\$ 1,118,229,897	13.5%	11.9%	1.6%
INDUSTRIAL	\$ 977,683,159	11.8%	11.6%	0.2%
COMMUNICATIONS	\$ 699,572,163	8.5%	9.0%	(0.5%)
BASIC MATERIALS	\$ 436,346,779	5.3%	6.2%	(1.0%)
ENERGY	\$ 433,125,657	5.2%	5.5%	(0.2%)
TECHNOLOGY	\$ 335,844,673	4.1%	4.8%	(0.7%)
UTILITIES	\$ 269,232,210	3.3%	3.5%	(0.2%)
CASH	\$ 117,242,003	1.4%	0.0%	1.4%
DIVERSIFIED	\$ 57,905,424	0.7%	0.9%	(0.2%)
INDEX	\$ 20,269,250	0.2%	0.0%	0.2%
FX	\$ (99,760)	(0.0%)	0.0%	(0.0%)
GRAND TOTAL	\$ 8,255,693,447	100.0%	100.0%	0.0%

Top 20 Industry Groups (Public Intl Only)	\$ Value	% Value	*Blended NON-US BM	Difference
1 BANKS	\$ 956,505,481	11.6%	12.3%	(0.7%)
2 PHARMACEUTICALS	\$ 679,096,985	8.2%	7.6%	0.7%
3 TELECOMMUNICATIONS	\$ 454,952,396	5.5%	5.7%	(0.2%)
4 INSURANCE	\$ 424,866,803	5.1%	4.9%	0.2%
5 FOOD	\$ 415,289,503	5.0%	4.5%	0.5%
6 OIL&GAS	\$ 393,066,966	4.8%	5.0%	(0.2%)
7 RETAIL	\$ 310,792,776	3.8%	2.8%	0.9%
8 AUTO MANUFACTURERS	\$ 245,433,769	3.0%	3.2%	(0.2%)
9 CHEMICALS	\$ 241,491,749	2.9%	3.3%	(0.4%)
10 BEVERAGES	\$ 198,717,420	2.4%	2.4%	(0.0%)
11 ELECTRIC	\$ 183,838,259	2.2%	2.3%	(0.1%)
12 DIVERSIFIED FINAN SERV	\$ 179,784,054	2.2%	2.5%	(0.3%)
13 COMMERCIAL SERVICES	\$ 175,818,088	2.1%	2.0%	0.2%
14 REAL ESTATE	\$ 157,744,460	1.9%	2.2%	(0.3%)
15 SEMICONDUCTORS	\$ 156,851,204	1.9%	2.4%	(0.5%)
16 BUILDING MATERIALS	\$ 146,760,051	1.8%	1.3%	0.5%
17 TRANSPORTATION	\$ 146,148,828	1.8%	1.8%	0.0%
18 COSMETICS/PERSONAL CARE	\$ 133,694,055	1.6%	1.7%	(0.1%)
19 MINING	\$ 125,916,335	1.5%	1.8%	(0.3%)
20 AUTO PARTS&EQUIPMENT	\$ 122,914,628	1.5%	1.3%	0.2%

*Blended NON-US BM: 72% MSCI EAFE, 20% MSCI EM, 8% MSCI Sml Cap.

INTERNATIONAL EQUITY EXPOSURE OVERVIEW

Country Category (Public Intl Equity Only)	\$ Value	% Value	*Blended NON-US BM	Difference
EUROPE DEVELOPED	\$ 4,869,906,568	59.0%	50.9%	8.1%
ASIA DEVELOPED	\$ 2,037,088,829	24.7%	29.2%	(4.5%)
ASIA EM	\$ 753,265,094	9.1%	14.0%	(4.9%)
LATIN AMERICA	\$ 187,872,329	2.3%	2.8%	(0.5%)
NORTH AMERICA	\$ 178,720,660	2.2%	0.1%	2.1%
MIDDLE EAST	\$ 96,864,130	1.2%	1.0%	0.2%
AFRICA	\$ 84,301,174	1.0%	1.5%	(0.5%)
EUROPE EM	\$ 47,674,662	0.6%	0.5%	0.1%
GRAND TOTAL	\$ 8,255,693,447	100.0%	100.0%	0.0%

Market Cap** (Public Intl Equities Only)	\$ Value	% Value	*Blended NON-US BM	Difference
1) 0 - 100M	\$ 1,575,010	0.0%	0.0%	0.0%
2) 100M - 500M	\$ 68,206,299	0.8%	0.4%	0.4%
3) 500M - 1B	\$ 142,237,304	1.8%	1.2%	0.5%
4) 1B - 5B	\$ 977,514,603	12.0%	12.6%	(0.5%)
5) 5B - 10B	\$ 1,090,308,774	13.4%	13.2%	0.3%
6) 10B - 50B	\$ 3,438,421,053	42.4%	40.4%	2.0%
7) >50B	\$ 2,396,976,015	29.5%	32.2%	(2.7%)
GRAND TOTAL	\$ 8,115,239,057	100.0%	100.0%	0.0%

**Excludes cash and non-traded securities

ARIZONA STATE RETIREMENT SYSTEM

As of April 30, 2016

TOTAL FIXED INCOME EXPOSURE OVERVIEW

Sector (Public Fixed Income Only)	\$ Value	% Value	*Blended FI BM	Difference
GOVERNMENT	\$ 1,458,175,661	29.3%	31.9%	(2.5%)
MORTGAGE SECURITIES	\$ 1,065,066,104	21.4%	21.6%	(0.2%)
FINANCIAL	\$ 392,300,663	7.9%	9.1%	(1.2%)
INDEX	\$ 387,768,095	7.8%	0.0%	7.8%
COMMUNICATIONS	\$ 354,514,654	7.1%	7.6%	(0.5%)
CONSUMER NON-CYCLICAL	\$ 335,751,428	6.8%	7.6%	(0.9%)
CONSUMER CYCLICAL	\$ 227,095,269	4.6%	5.1%	(0.5%)
ENERGY	\$ 209,131,743	4.2%	5.6%	(1.4%)
INDUSTRIAL	\$ 163,681,854	3.3%	3.9%	(0.6%)
TECHNOLOGY	\$ 113,013,844	2.3%	2.2%	0.1%
UTILITIES	\$ 90,150,010	1.8%	2.2%	(0.4%)
BASIC MATERIALS	\$ 80,298,143	1.6%	2.8%	(1.1%)
CASH	\$ 45,942,878	0.9%	0.0%	0.9%
BANK LOANS	\$ 26,882,567	0.5%	0.0%	0.5%
ASSET BACKED SECURITIES	\$ 18,154,380	0.4%	0.4%	0.0%
DIVERSIFIED	\$ 2,550,295	0.1%	0.1%	(0.1%)
GRAND TOTAL	\$ 4,970,477,590	100.0%	100.0%	0.0%

Top 20 Industry Groups (Public Fixed Income Only)	\$ Value	% Value	*Blended FI BM	Difference
1 SOVEREIGN	\$ 1,385,251,443	28.2%	30.0%	(1.8%)
2 FNMA COLLATERAL	\$ 618,248,325	12.6%	9.2%	3.3%
3 BLANK	\$ 406,718,267	8.3%	0.0%	8.3%
4 FGLMC COLLATERAL	\$ 214,131,470	4.4%	5.7%	(1.3%)
5 BANKS	\$ 202,267,829	4.1%	5.1%	(1.0%)
6 TELECOMMUNICATIONS	\$ 151,575,963	3.1%	3.7%	(0.6%)
7 MEDIA	\$ 145,036,660	3.0%	3.3%	(0.4%)
8 GNMA2 COLLATERAL	\$ 104,258,409	2.1%	4.8%	(2.7%)
9 OIL&GAS	\$ 100,787,141	2.1%	3.1%	(1.1%)
10 HEALTHCARE-SERVICES	\$ 94,024,296	1.9%	1.9%	(0.0%)
11 COMMERCIAL MBS	\$ 92,824,511	1.9%	1.3%	0.6%
12 DIVERSIFIED FINAN SERV	\$ 90,240,088	1.8%	2.0%	(0.1%)
13 ELECTRIC	\$ 83,972,352	1.7%	2.0%	(0.3%)
14 PHARMACEUTICALS	\$ 78,634,744	1.6%	1.5%	0.1%
15 RETAIL	\$ 74,145,048	1.5%	1.7%	(0.2%)
16 PIPELINES	\$ 71,227,722	1.5%	1.4%	0.0%
17 CASH	\$ 64,245,102	1.3%	0.0%	1.3%
18 SOFTWARE	\$ 58,305,970	1.2%	1.0%	0.2%
19 CHEMICALS	\$ 53,656,226	1.1%	0.9%	0.2%
20 MUNICIPAL	\$ 49,723,155	1.0%	0.6%	0.4%

Credit Rating Group** (Public Fixed Income Only)	\$ Value	% Value	*Blended FI BM	Difference
01) AAA	\$ 2,915,679,905	58.7%	52.3%	6.4%
02) AA	\$ 152,511,808	3.1%	3.1%	(0.0%)
03) A	\$ 376,904,137	7.6%	7.9%	(0.3%)
04) BBB	\$ 545,097,046	11.0%	11.1%	(0.2%)
05) BB	\$ 435,855,814	8.8%	13.0%	(4.3%)
06) B	\$ 439,203,365	8.8%	9.4%	(0.5%)
07) CCC	\$ 94,721,648	1.9%	2.9%	(1.0%)
08) CC	\$ 793,932	0.0%	0.2%	(0.1%)
09) C	\$ 52,240	0.0%	0.0%	(0.0%)
10) D	\$ 7,928,901	0.2%	0.0%	0.1%
11) Not Rated	\$ 1,728,795	0.0%	0.1%	(0.0%)
GRAND TOTAL	\$ 4,970,477,591	100.0%	100.0%	0.0%

Maturity Bucket (Public Fixed Income Only)	\$ Value	% Value	*Blended FI BM	Difference
0-1Y	\$ 138,315,071	3.0%	0.8%	2.2%
1Y-3Y	\$ 690,698,546	15.0%	18.8%	(3.7%)
3Y-5Y	\$ 709,492,044	15.5%	18.1%	(2.7%)
5Y-10Y	\$ 1,519,297,859	33.1%	29.4%	3.7%
10Y-15Y	\$ 154,623,044	3.4%	4.4%	(1.0%)
15Y+	\$ 1,377,704,404	30.0%	28.6%	1.5%
GRAND TOTAL	\$ 4,590,130,970	100.0%	100.0%	0.0%

*Blended TOTAL BM: 73% BC US AGG, 27% BC US HY.

ARIZONA STATE RETIREMENT SYSTEM
As of April 30, 2016

TOTAL PLAN RISK OVERVIEW

Strategy	\$ Value	% Value	Historical VaR 95%	HVaR Contri 95%	HVaR Contri % to Total	Parametric VaR 95%	PVaR Contri 95%	PVaR Contri % to Total	Exp Tail Loss 95%	Exp Tail Loss Contri 95%	Exp Tail Loss Contri % to Total	Max Loss	Std Dev	Downside Risk (8%)	Downside Risk Contri (8%)	Downside Risk Contri (8%) to Total
MONTHLY RISK																
CASH - UNASSETIZED	\$ 36,372,161	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	(0.6%)	(0.0%)	0.0%
CASH - ASSETIZED	\$ 362,661,450	1%	(6.3%)	(0.1%)	1.1%	(6.1%)	(0.1%)	0.9%	(10.2%)	(0.1%)	0.9%	(23.8%)	4.0%	(3.2%)	(0.0%)	0.9%
INTEREST RATE SENSITIVE	\$ 4,970,477,590	15%	(2.4%)	(0.0%)	0.7%	(2.2%)	(0.0%)	0.4%	(3.2%)	(0.0%)	0.1%	(5.4%)	1.4%	(1.3%)	(0.0%)	0.7%
US EQUITY	\$ 8,667,232,513	26%	(8.3%)	(2.2%)	32.5%	(8.1%)	(2.0%)	29.6%	(14.1%)	(3.6%)	31.1%	(29.5%)	5.6%	(4.1%)	(1.0%)	29.8%
INTERNATIONAL EQUITY	\$ 8,255,693,447	24%	(10.0%)	(2.1%)	30.9%	(9.5%)	(2.2%)	32.9%	(15.0%)	(3.5%)	30.4%	(35.5%)	6.3%	(4.6%)	(1.1%)	32.2%
REAL ESTATE	\$ 3,069,878,225	9%	(10.3%)	(0.9%)	13.8%	(10.7%)	(0.9%)	13.3%	(18.6%)	(1.6%)	13.8%	(38.6%)	7.0%	(5.3%)	(0.5%)	13.1%
FARMLAND & TIMBER	\$ 186,940,434	1%	(10.9%)	(0.1%)	0.9%	(11.3%)	(0.1%)	0.9%	(19.7%)	(0.1%)	0.9%	(40.8%)	7.3%	(5.6%)	(0.0%)	0.8%
PRIVATE EQUITY	\$ 2,667,939,829	8%	(11.5%)	(0.9%)	13.6%	(10.8%)	(0.8%)	11.7%	(18.2%)	(1.4%)	12.2%	(36.4%)	7.0%	(5.3%)	(0.4%)	11.8%
PRIVATE DEBT	\$ 2,534,069,913	8%	(2.4%)	0.0%	(0.2%)	(4.0%)	(0.2%)	2.8%	(7.7%)	(0.4%)	3.2%	(17.3%)	2.7%	(2.2%)	(0.1%)	3.1%
OPPORTUNISTIC EQUITY	\$ 309,012,775	1%	(10.8%)	(0.1%)	1.5%	(10.1%)	(0.1%)	1.3%	(17.0%)	(0.2%)	1.3%	(34.1%)	6.5%	(5.0%)	(0.0%)	1.3%
OPPORTUNISTIC DEBT	\$ 1,088,751,787	3%	(7.3%)	(0.1%)	1.9%	(9.3%)	(0.2%)	3.4%	(14.4%)	(0.4%)	3.2%	(28.6%)	5.8%	(4.3%)	(0.1%)	3.3%
GLOBAL INFLATION LINKED	\$ 208,581,853	1%	(8.7%)	(0.0%)	0.5%	(8.7%)	(0.0%)	0.5%	(12.8%)	(0.1%)	0.5%	(28.2%)	5.1%	(4.3%)	(0.0%)	0.6%
INFRASTRUCTURE	\$ 325,444,190	1%	(9.4%)	(0.1%)	1.3%	(9.1%)	(0.1%)	1.3%	(15.1%)	(0.1%)	1.3%	(35.1%)	5.8%	(4.6%)	(0.0%)	1.3%
MULTI-ASSET CLASS	\$ 1,042,988,946	3%	(4.8%)	(0.1%)	1.6%	(4.7%)	(0.1%)	1.1%	(6.7%)	(0.1%)	1.1%	(10.3%)	2.8%	(2.5%)	(0.0%)	1.2%
GRAND TOTAL	\$ 33,726,045,112	100%	(6.8%)	(6.8%)	100.0%	(6.8%)	(6.8%)	100.0%	(11.5%)	(11.5%)	100.0%	(26.8%)	4.6%	(3.5%)	(3.5%)	100.0%
INTERIM POLICY BENCHMARK			(6.6%)			(6.6%)			(10.9%)			(25.8%)	4.5%	(3.3%)		

ANNUALIZED RISK																
CASH - UNASSETIZED	\$ 36,372,161	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	0.0%	(2.2%)	(0.0%)	0.0%
CASH - ASSETIZED	\$ 362,661,450	1%	(21.8%)	(0.2%)	1.1%	(21.0%)	(0.2%)	0.9%	(35.4%)	(0.4%)	0.9%	N/A	13.7%	(10.9%)	(0.1%)	0.9%
INTEREST RATE SENSITIVE	\$ 4,970,477,590	15%	(8.2%)	(0.2%)	0.7%	(7.7%)	(0.1%)	0.4%	(11.2%)	(0.1%)	0.1%	N/A	4.9%	(4.5%)	(0.1%)	0.7%
US EQUITY	\$ 8,667,232,513	26%	(28.8%)	(7.7%)	32.5%	(28.0%)	(7.0%)	29.6%	(48.8%)	(12.4%)	31.1%	N/A	19.4%	(14.2%)	(3.6%)	29.8%
INTERNATIONAL EQUITY	\$ 8,255,693,447	24%	(34.6%)	(7.3%)	30.9%	(33.0%)	(7.8%)	32.9%	(52.0%)	(12.1%)	30.4%	N/A	21.7%	(16.0%)	(3.9%)	32.2%
REAL ESTATE	\$ 3,069,878,225	9%	(35.7%)	(3.3%)	13.8%	(37.0%)	(3.1%)	13.3%	(64.4%)	(5.5%)	13.8%	N/A	24.1%	(18.2%)	(1.6%)	13.1%
FARMLAND & TIMBER	\$ 186,940,434	1%	(37.7%)	(0.2%)	0.9%	(39.2%)	(0.2%)	0.9%	(68.1%)	(0.4%)	0.9%	N/A	25.5%	(19.2%)	(0.1%)	0.8%
PRIVATE EQUITY	\$ 2,667,939,829	8%	(40.0%)	(3.2%)	13.6%	(37.3%)	(2.8%)	11.7%	(62.9%)	(4.9%)	12.2%	N/A	24.1%	(18.5%)	(1.4%)	11.8%
PRIVATE DEBT	\$ 2,534,069,913	8%	(8.3%)	0.0%	(0.2%)	(13.9%)	(0.7%)	2.8%	(26.6%)	(1.3%)	3.2%	N/A	9.4%	(7.7%)	(0.4%)	3.1%
OPPORTUNISTIC EQUITY	\$ 309,012,775	1%	(37.4%)	(0.3%)	1.5%	(34.9%)	(0.3%)	1.3%	(58.9%)	(0.5%)	1.3%	N/A	22.6%	(17.4%)	(0.2%)	1.3%
OPPORTUNISTIC DEBT	\$ 1,088,751,787	3%	(25.3%)	(0.5%)	1.9%	(32.1%)	(0.8%)	3.4%	(49.9%)	(1.3%)	3.2%	N/A	20.1%	(14.8%)	(0.4%)	3.3%
GLOBAL INFLATION LINKED	\$ 208,581,853	1%	(30.1%)	(0.1%)	0.5%	(30.0%)	(0.1%)	0.5%	(44.4%)	(0.2%)	0.5%	N/A	17.8%	(15.0%)	(0.1%)	0.6%
INFRASTRUCTURE	\$ 325,444,190	1%	(32.7%)	(0.3%)	1.3%	(31.5%)	(0.3%)	1.3%	(52.2%)	(0.5%)	1.3%	N/A	20.0%	(16.0%)	(0.2%)	1.3%
MULTI-ASSET CLASS	\$ 1,042,988,946	3%	(16.5%)	(0.4%)	1.6%	(16.3%)	(0.3%)	1.1%	(23.1%)	(0.4%)	1.1%	N/A	9.5%	(8.7%)	(0.1%)	1.2%
GRAND TOTAL	\$ 33,726,045,112	100%	(23.7%)	(23.7%)	100.0%	(23.6%)	(23.6%)	100.0%	(40.0%)	(40.0%)	100.0%	N/A	15.8%	(12.1%)	(12.1%)	100.0%
INTERIM POLICY BENCHMARK			(23.0%)			(22.7%)			(37.9%)			N/A	15.4%	(11.5%)		

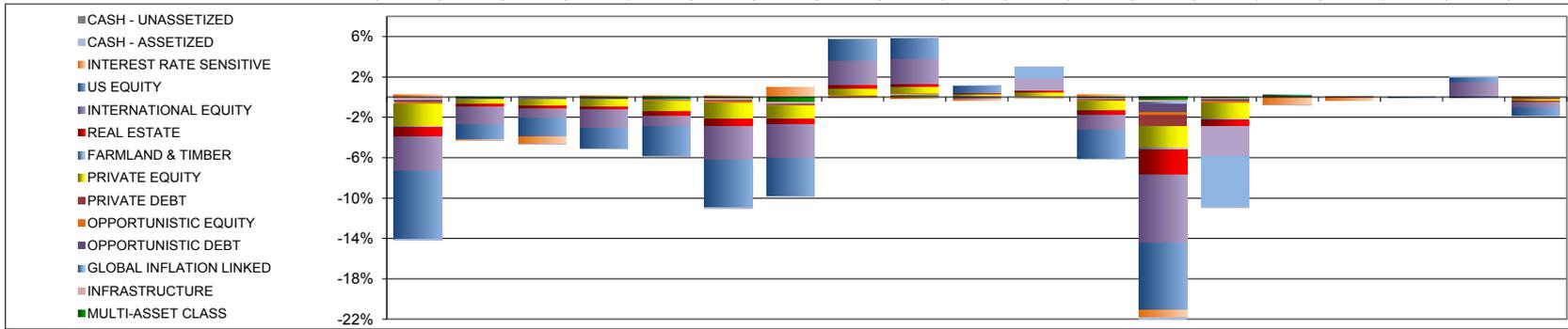
Strategy	\$ Value	% Value	Beta SP500	Corr SP500	Beta MSCI EAFE	Corr MSCI EAFE	Duration	Convexity	Notional Exposure	Gross Exposure	Gross Leverage
CASH - UNASSETIZED	\$ 36,372,161	0%	0.00		0.00				\$ 36,372,161	\$ 36,372,161	100.0%
CASH - ASSETIZED	\$ 362,661,450	1%	0.29	0.94	0.25	0.94			\$ 869,966,471	\$ 362,661,450	100.0%
INTEREST RATE SENSITIVE	\$ 4,970,477,590	15%	0.01	0.02	0.02	0.10	5.27	0.135	\$ 4,695,030,985	\$ 4,970,653,750	100.0%
US EQUITY	\$ 8,667,232,513	26%	1.03	0.99	0.80	0.90	0.61	0.004	\$ 8,774,021,092	\$ 8,677,372,062	100.1%
INTERNATIONAL EQUITY	\$ 8,255,693,447	24%	1.06	0.90	1.00	0.99			\$ 8,264,106,781	\$ 8,310,607,673	100.7%
REAL ESTATE	\$ 3,069,878,225	9%	1.13	0.87	0.98	0.88			\$ 3,069,878,225	\$ 3,069,878,225	100.0%
FARMLAND & TIMBER	\$ 186,940,434	1%	1.20	0.87	1.03	0.88			\$ 186,940,434	\$ 186,940,434	100.0%
PRIVATE EQUITY	\$ 2,667,939,829	8%	1.24	0.95	0.95	0.85			\$ 2,667,939,829	\$ 2,667,939,829	100.0%
PRIVATE DEBT	\$ 2,534,069,913	8%	0.31	0.61	0.26	0.59	0.65	0.009	\$ 2,526,240,319	\$ 2,534,087,498	100.0%
OPPORTUNISTIC EQUITY	\$ 309,012,775	1%	1.16	0.95	0.89	0.85			\$ 309,012,775	\$ 309,012,775	100.0%
OPPORTUNISTIC DEBT	\$ 1,088,751,787	3%	0.75	0.69	0.65	0.70			\$ 1,088,751,787	\$ 1,088,751,787	100.0%
GLOBAL INFLATION LINKED	\$ 208,581,853	1%	0.30	0.64	0.27	0.68	0.15	0.000	\$ 432,476,412	\$ 208,581,853	100.0%
INFRASTRUCTURE	\$ 325,444,190	1%	1.05	0.97	0.90	0.98			\$ 325,444,190	\$ 325,444,190	100.0%
MULTI-ASSET CLASS	\$ 1,042,988,946	3%	0.07	0.56	0.05	0.46	(8.16)	(0.847)	\$ (4,070,910,137)	\$ 3,658,823,870	350.8%
GRAND TOTAL	\$ 33,726,045,112	100%	0.95	0.96	0.80	0.96	4.84	0.118	\$ 29,175,271,323	\$ 36,407,127,556	107.9%

ARIZONA STATE RETIREMENT SYSTEM
As of April 30, 2016

TOTAL PLAN STRESS TESTS

Strategy	\$ Value	% Value	Historical Scenarios													Predictive Scenarios					
			Black Monday - 5 Day	Gulf War - 5 Day	Bond Crash: Feb 94 - May 94	Asian Crisis 97-98 - 5 day	Russian Crisis - 5 Day	Masdaq Correction: July 98 - Aug 98	Russian Debt Crisis: Aug - Oct	IR Steepening: Sept 98 - Nov 98	Emerging Markets Rally: Jan 99 - May 99	Fed Tightening: April - June 99	Nasdaq Rally: Nov 99 - Jan 00	9/11 Attack - 5 Day	09-10-2008	S&P -500 -20%	IR Parallel Shift +100bps	Spread Up 100bps	Inflation +1%	Gold Shock -20%	Oil Shock -20%
Stress Test Stand Alone																					
CASH - UNASSETIZED	\$ 36,372,161	0.1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CASH - ASSETIZED	\$ 362,661,450	1.1%	(14.6)	(3.7)	(8.8)	(4.2)	(6.4)	(13.8)	(3.1)	4.9	11.1	2.9	4.7	(5.6)	(19.1)	(11.2)	(3.8)	0.0	0.5	0.9	(1.5)
INTEREST RATE SENSITIVE	\$ 4,970,477,511	14.7%	1.4	(0.2)	(4.5)	0.7	0.7	1.2	6.6	(0.2)	(0.8)	(0.6)	(1.0)	1.3	(5.0)	0.5	(5.1)	(0.3)	0.5	0.0	0.4
US EQUITY	\$ 8,667,232,513	25.7%	(26.1)	(5.7)	(7.4)	(7.9)	(11.5)	(18.2)	(14.8)	8.2	7.5	2.7	4.0	(11.1)	(26.0)	(19.2)	(0.0)	0.0	0.0	1.8	(2.9)
INTERNATIONAL EQUITY	\$ 8,255,861,873	24.5%	(14.0)	(7.4)	(3.7)	(7.5)	(4.2)	(13.8)	(13.6)	9.8	10.3	(0.9)	5.2	(6.1)	(27.3)	(12.0)	(0.0)	0.0	(0.0)	6.0	(2.3)
REAL ESTATE	\$ 3,069,878,225	9.1%	(10.7)	(2.4)	(3.1)	(3.3)	(4.8)	(7.6)	(6.1)	3.4	3.1	1.1	1.6	(4.6)	(27.5)	(7.9)	0.0	0.0	0.0	0.0	(1.0)
FARMLAND & TIMBER	\$ 186,940,434	0.6%	(11.4)	(2.5)	(3.3)	(3.4)	(5.0)	(8.0)	(6.5)	3.6	3.3	1.2	1.7	(4.8)	(29.0)	(8.4)	0.0	0.0	0.0	0.0	(1.0)
PRIVATE EQUITY	\$ 2,667,939,829	7.9%	(27.6)	(6.1)	(7.9)	(8.3)	(12.2)	(19.4)	(15.7)	8.7	7.9	2.8	4.2	(11.8)	(27.1)	(20.3)	0.0	0.0	0.0	0.0	(3.2)
PRIVATE DEBT	\$ 2,534,069,913	7.5%	(0.4)	(0.1)	(0.1)	(0.1)	(0.2)	(0.3)	(0.1)	0.1	0.1	0.0	0.1	(0.2)	(15.7)	(0.3)	(0.0)	(0.0)	0.0	0.0	(0.1)
OPPORTUNISTIC EQUITY	\$ 309,012,775	0.9%	(25.8)	(5.7)	(7.4)	(7.8)	(11.4)	(18.2)	(14.7)	8.2	7.4	2.7	3.9	(11.0)	(25.4)	(19.0)	0.0	0.0	0.0	0.0	(3.0)
OPPORTUNISTIC DEBT	\$ 1,088,751,787	3.2%	(5.4)	(1.2)	(1.5)	(1.6)	(2.4)	(3.8)	(3.1)	1.7	1.5	0.6	0.8	(2.3)	(27.3)	(4.0)	0.0	0.0	0.0	0.0	(1.2)
GLOBAL INFLATION LINKED	\$ 208,581,853	0.6%	(0.0)	0.0	0.1	(0.0)	(0.0)	(0.0)	(0.2)	(0.0)	0.0	0.0	0.0	(0.0)	(18.0)	0.0	0.1	0.0	(0.0)	(3.8)	(6.5)
INFRASTRUCTURE	\$ 325,444,190	1.0%	(21.1)	(4.7)	(6.0)	(6.4)	(9.3)	(14.9)	(12.0)	6.7	6.1	2.2	3.2	(9.0)	(28.3)	(15.5)	0.0	0.0	0.0	0.0	(2.7)
MULTI-ASSET CLASS	\$ 1,042,988,946	3.1%	(2.6)	(2.6)	(1.9)	(2.7)	(5.5)	(5.1)	(17.3)	(0.2)	7.2	1.7	1.9	(4.2)	(7.9)	(3.5)	6.8	0.0	(0.5)	2.1	(1.3)
GRAND TOTAL	\$ 33,726,213,459	100.0%	(14.0)	(4.3)	(4.7)	(5.1)	(5.8)	(10.9)	(8.9)	5.8	5.8	0.9	2.9	(6.0)	(22.1)	(10.9)	(0.6)	(0.3)	0.1	2.0	(1.8)
INTERIM POLICY BENCHMARK			(14.4)	(4.6)	(5.3)	(5.6)	(5.6)	(11.5)	(7.9)	6.7	6.8	0.8	3.2	(6.0)	(21.2)	(11.2)	(1.2)	(0.6)	0.1	2.1	(1.9)

Stress Test Contribution																					
CASH - UNASSETIZED	\$ 36,372,161	0.1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASH - ASSETIZED	\$ 362,661,450	1.1%	(0.2)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.0)	0.1	0.1	0.0	0.1	(0.1)	(0.2)	(0.1)	(0.0)	0.0	0.0	0.0	(0.0)
INTEREST RATE SENSITIVE	\$ 4,970,477,511	14.7%	0.2	(0.0)	(0.7)	0.1	0.1	0.2	1.0	(0.0)	(0.1)	(0.1)	(0.1)	0.2	(0.7)	0.1	(0.7)	(0.3)	0.1	0.0	0.1
US EQUITY	\$ 8,667,232,513	25.7%	(6.7)	(1.5)	(1.9)	(2.0)	(3.0)	(4.7)	(3.8)	2.1	1.9	0.7	1.0	(2.9)	(6.7)	(4.9)	(0.0)	0.0	0.0	0.5	(0.7)
INTERNATIONAL EQUITY	\$ 8,255,861,873	24.5%	(3.4)	(1.8)	(0.9)	(1.8)	(1.0)	(3.4)	(3.3)	2.4	2.5	(0.2)	1.3	(1.5)	(6.7)	(2.9)	(0.0)	0.0	(0.0)	1.5	(0.6)
REAL ESTATE	\$ 3,069,878,225	9.1%	(1.0)	(0.2)	(0.3)	(0.3)	(0.4)	(0.7)	(0.6)	0.3	0.3	0.1	0.1	(0.4)	(2.5)	(0.7)	0.0	0.0	0.0	0.0	(0.1)
FARMLAND & TIMBER	\$ 186,940,434	0.6%	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.2)	(0.0)	0.0	0.0	0.0	0.0	(0.0)
PRIVATE EQUITY	\$ 2,667,939,829	7.9%	(2.2)	(0.5)	(0.6)	(0.7)	(1.0)	(1.5)	(1.2)	0.7	0.6	0.2	0.3	(0.9)	(2.1)	(1.6)	0.0	0.0	0.0	0.0	(0.3)
PRIVATE DEBT	\$ 2,534,069,913	7.5%	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(1.2)	(0.0)	(0.0)	(0.0)	0.0	0.0	(0.0)
OPPORTUNISTIC EQUITY	\$ 309,012,775	0.9%	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	0.1	0.1	0.0	0.0	(0.1)	(0.2)	(0.2)	0.0	0.0	0.0	0.0	(0.0)
OPPORTUNISTIC DEBT	\$ 1,088,751,787	3.2%	(0.2)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	0.1	0.0	0.0	0.0	(0.1)	(0.9)	(0.1)	0.0	0.0	0.0	0.0	(0.0)
GLOBAL INFLATION LINKED	\$ 208,581,853	0.6%	(0.0)	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.1)	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)
INFRASTRUCTURE	\$ 325,444,190	1.0%	(0.2)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	0.1	0.1	0.0	0.0	(0.1)	(0.3)	(0.1)	0.0	0.0	0.0	0.0	(0.0)
MULTI-ASSET CLASS	\$ 1,042,988,946	3.1%	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.5)	(0.0)	0.2	0.1	0.1	(0.1)	(0.2)	(0.1)	0.2	0.0	(0.0)	0.1	(0.0)
GRAND TOTAL	\$ 33,726,213,459	100.0%	(14.0)	(4.3)	(4.7)	(5.1)	(5.8)	(10.9)	(8.9)	5.8	5.8	0.9	2.9	(6.0)	(22.1)	(10.9)	(0.6)	(0.3)	0.1	2.0	(1.8)
INTERIM POLICY BENCHMARK			(14.4)	(4.6)	(5.3)	(5.6)	(5.6)	(11.5)	(7.9)	6.7	6.8	0.8	3.2	(6.0)	(21.2)	(11.2)	(1.2)	(0.6)	0.1	2.1	(1.9)



GLOSSARY	DEFINITION	INTERPRETATION
Historical VaR 95%	A risk metric that is derived from a full revaluation historical simulation of the risk factors impacting a portfolio, <u>making no assumption of the tail distribution</u> , and reporting the largest loss likely to be suffered over a holding period (1Month for ASRS) 5 times out of 100, or 1 month out of 20	Value at Risk is a number, measured in price units or as percentage of portfolio value, which tells you that in a defined large percentage of cases (usually 95% or 99%) your portfolio is likely to not lose more than that amount of money. Or said the other way around, in a defined small percentage of cases (5% or 1%) your loss is expected to be greater than that number.
HVaR Contri 95%	This is the decomposition of the VaR, making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
HVaR Contri % to Total	This is the VaR contribution displayed in percent.	
Parametric VaR 95%	A risk metric that is derived from a full revaluation historical simulation of the risk factors impacting a portfolio, <u>making a Normal distribution assumption of the tail distribution</u> , and reporting the largest loss likely to be suffered over a holding period (1Month for ASRS) 5 times out of 100, or 1 month out of 20.	Value at Risk is a number, measured in price units or as percentage of portfolio value, which tells you that in a defined large percentage of cases (usually 95% or 99%) your portfolio is likely to not lose more than that amount of money. Or said the other way around, in a defined small percentage of cases (5% or 1%) your loss is expected to be greater than that number.
PVaR Contri 95%	This is the decomposition of the VaR, making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
PVaR Contri % to Total	This is the VaR contribution displayed in percent.	
Exp Tail Loss 95%	Also known as Conditional VaR or ETL, it is derived by taking a weighted average between the VaR and losses exceeding the VaR. If VaR is reported at 95.0%, then ETL will average the losses between 95.1% to 99.9%. It is a risk measure that assesses the risk beyond VaR and into the tail end of the distribution of loss.	A measure that produces better incentives for traders than VaR is expected shortfall. This is also sometimes referred to as Conditional VaR, or tail loss. <u>Where VaR asks the question 'how bad can things get?', expected shortfall asks 'if things do get bad, what is our expected loss?'</u>
Exp Tail Loss Contri 95%	This is the decomposition of the ETL making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
Exp Tail Loss Contri % to Total	This is the ETL contribution displayed in percent.	
Max Loss	The maximum projected loss.	
Downside Risk (8.7%)	A risk metric that distinguishes between "good" and "bad" returns by assigning risk only to those returns below a return specified by an investor. Downside risk is considered a more effective risk measure than standard deviation (volatility) for two important reasons: 1) it is investor specific, and 2) it identifies return distributions that have higher probabilities for negative ("left tail") market events. Downside risk is also referred to as downside deviation or target semi-deviation.	A 5% downside risk with an 8.7% MAR means that the conditional average underperformance (below 8.7% annual) is 5%, adjusted for a positive skew (greater than the MAR). Effectively, downside risk amplifies a big loss (by squaring the distance of that loss to the target) and smoothes out the risk measure by taking into account the gains setting them up to be equal to the target MAR.
Downside Risk Contri (8.7%)	This is the decomposition of the downside risk, making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
Downside Risk Contri (8.7%) to Total	This is the downside risk contribution displayed in percent.	

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Agenda Item #6

IMD Activities

Arizona State Retirement System

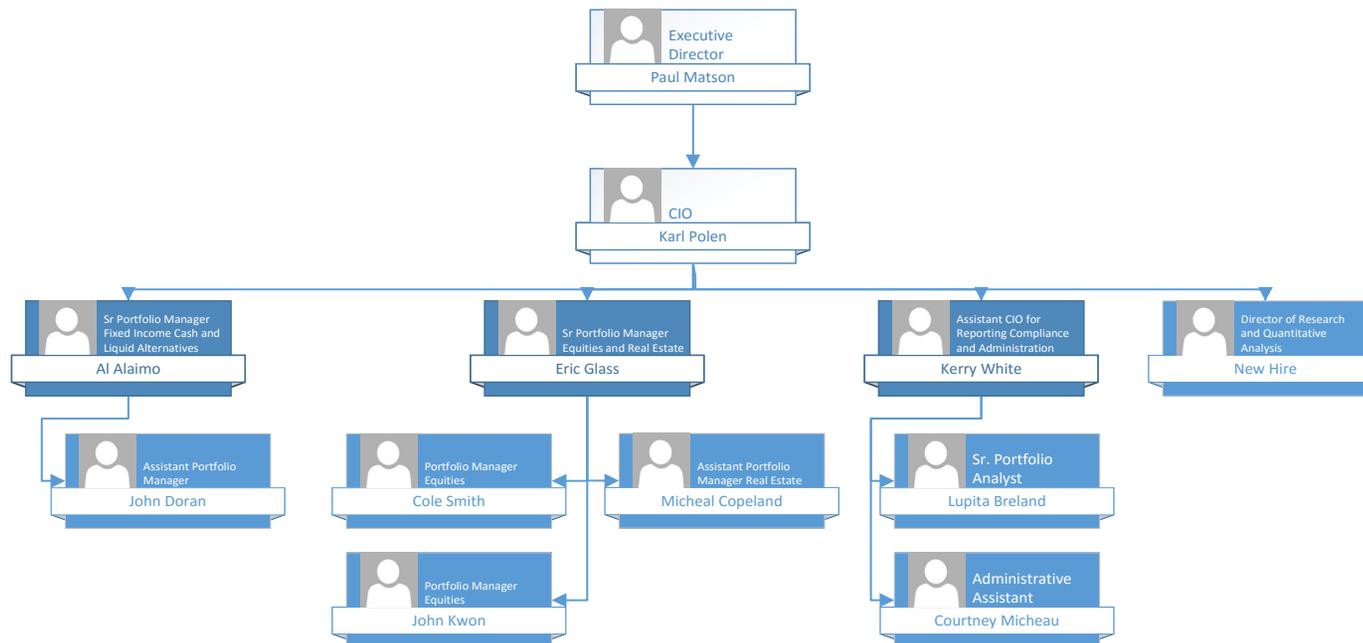
June 20, 2016

Reorganization Completed

- Reorganization was completed with the appointment of Eric Glass as Senior Portfolio Manager of Equities and Real Estate
- In this capacity, Mr. Glass will oversee public equities, private equities, commodities and real estate
- We have commenced recruiting for the Director of Research and Quantitative Analysis position

Organization Chart

Investment Management Organization



Notes:

1. The Investment Strategy Committee is a committee of the whole co-chaired by the Exec. Director and CIO. It decides policy matters and refers investments for decision to asset class committees for review pursuant to SIP006.
2. The Tactical Positioning Committee makes tactical and rebalance decisions. Its members are the Exec. Director, CIO, Asst. CIO and each of the Sr. Portfolio Managers.
3. Asset Class Committees include the Exec. Director, CIO, Asst. CIO and relevant portfolio managers. They are established pursuant to SIP006 and make investment decisions in accordance with the requirements of SIP006.
4. Various working groups are established for projects and continuing processes. Working groups report to the Investment Strategy Committee. The Exec. Director and CIO are active participants on various working groups.

Private Markets Committee Schedule

- The private markets committee met on the following days during 2016:
 - January 19
 - February 25
 - March 22
 - April 26
 - May 26
- The private markets committee is scheduled to meet:
 - June 24
 - July 20
 - Additional meetings anticipated monthly for the balance of the year

Private Markets Committee – April 22, 2016

- Approved a \$40 million renewal investment in a U.S. based lower middle market private equity sponsor
- Approved a \$3 million allocation increase to a shopping center investment

Private Markets Committee – May 26, 2016

- Approved a \$30 million investment in a co-invest vehicle to invest along side an existing partnership investing in health care related businesses

Public Markets Committee Meeting Schedule

- Starting with the June 24 meeting, the public markets committee will meet monthly in a joint session with the private markets committee
- The public markets agenda will include, at a minimum, a review of monthly reports and other administrative and investment items that arise from time to time

Public Markets Committee – May 2, 2016

- Approved a separate account of up to \$300 million to invest in business development companies (“BDCs”)
- Although listed public equities, BDCs invest in corporate loans and, as such, it was decided to place this investment in the opportunistic debt portfolio

Recent Accomplishments - Master Cash Optimization

- Several steps taken to minimize cash
- Have reduced master cash and established goal to run master cash at <1% of total fund
- Commenced program to routinely sweep cash from portfolios when that is preferable to reinvestment
 - Eliminates round trip transaction costs for sale of investments to meet predictable cash needs
- Optimized assetization
 - Eliminated more expensive foreign futures contracts from protocol
 - Changed procedure to assetize combined cash balances in two different “master cash” accounts to achieve 100% assetization at 2PM every day
- Switched to “STIF” from “GSTIF” for cash investment increasing yield by approximately 20bp
- Combined effect of these changes is \$3 to \$5 million per year improvement in performance

Portfolio Cash Optimization and Other Investment Accomplishments

- Internal equity portfolios have optimized cash
 - Internal equity portfolios have reduced cash to 10-20 bp, compared to previous 80b
 - reduces drag from futures equitization
 - reduces tracking error from imperfection of futures equitization for portfolios where there is not a well matched futures contract for the portfolio
 - Investment performance improvement is 2bp to 5bp on a \$6.7 billion portfolio, the equivalent of \$1 million to \$3 million per year
- Established weekly portfolio positioning meetings to review portfolio position and implement changes
 - Rebalanced portfolio from overweight U.S./underweight international to neutral
- Reformatted structure of passive EAFE holdings to EAFE fund from country funds
 - Established smaller, separate country fund account for tactical flexibility in weightings
 - Results in 3bp annual savings on \$3 bn+ portfolio (about \$1 million per year savings)

Process and Administrative Accomplishments

- Reformatted daily portfolio position report to accurately reflect exposures from cash assetization and the equity factor portfolio
- Identified anomalies in performance reporting from various vendors and implemented changes to increase accuracy, minimize differences and establish consistency in performance reporting
- Established weekly “all hands” meetings and combined calendars for manager meetings and team coverage
- Established corporate subscriptions and kindle accounts for shared reading resources
- Completed formalization of compliance for public and private portfolios (presenting to IC today)
- Completed performance analysis of multi asset category (presenting to IC today)

Work in Process - Portfolio Management

- Continued implementation of internal equity portfolio improvements
 - Optimization of trades around name changes including development of a model for the market microstructure of index changes
 - Factor based filters for trade timing
 - Optimization of equitization include “rich/cheap” analysis and consideration of alternate instruments or markets for equitization
 - Minimization of cash
- Further optimization of cash under consideration
 - Equitization of frictional cash in external manager portfolios
 - Integration of internal equity portfolio cash with master cash consolidating all assetization efforts in a single account and allowing the internal equity portfolios to operate effectively at zero cash

Work in Process - Investment Process

- A monthly reporting system for public market assets
 - Combines returns based and holdings based analysis for performance assessment
 - Goal is to identify and diagnose performance anomalies with an effort to separate skill from cyclical and equity factor effects allowing for
 - rebalance to cyclically undervalued strategies or factors
 - rebalance away from cyclically overvalued strategies or factors
 - increase or reduce funding to managers with positive or negative skill assessments
- Develop an integrated strategy paper for equities investing considering passive, factor driven and active strategies and their applicability to equity sub asset classes

Work in Process - Administrative Matters

- Real estate consulting RFP (presenting to IC today)
- Private equity consulting RFP
- Legal and tax SOPs
- Optimization of reporting systems
 - elimination of unused/less valuable reports
 - automation of reports retained to enhance quality control and minimize portfolio team time spent preparing reports
- Implementation of technology improvements and remodeled work spaces to encourage and enhance collaboration

Planned and Potential Future Projects

- Dynamic modeling for liquidity and risk management
- Enhanced processes and analytical methods for 2017 strategic asset allocation update
- Customized personnel systems for IMD to enhance careers, cross training, development and succession planning

Agenda Item #7

Arizona State Retirement System

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

June 20, 2016

Allan Martin, Partner, NEPC
Dan LeBeau, Consultant, NEPC



- ASRS Investment Objectives/Performance
- Independent Oversight/Compliance
 - SAA Policy Compliance
 - Total Fund and Asset Class Analysis
 - Asset Class Committee Monitoring
- Market Environment Update and Outlook
- Appendix: SAA Policy History

ASRS Investment Objectives/Performance

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



Macro

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

Micro

Source: ASRS Strategic Plan, March 2013

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

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

**Goal Met:
No**

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	1.4%	0.0%	6.7%	7.1%	5.7%	9.7%
Interim SAA Policy¹	1.4%	-1.4%	5.4%	6.2%	5.4%	9.4%
Excess Return	0.0%	1.4%	1.3%	0.9%	0.3%	0.3%

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

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

Arizona State Retirement System
Total Fund Attribution Analysis

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

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

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

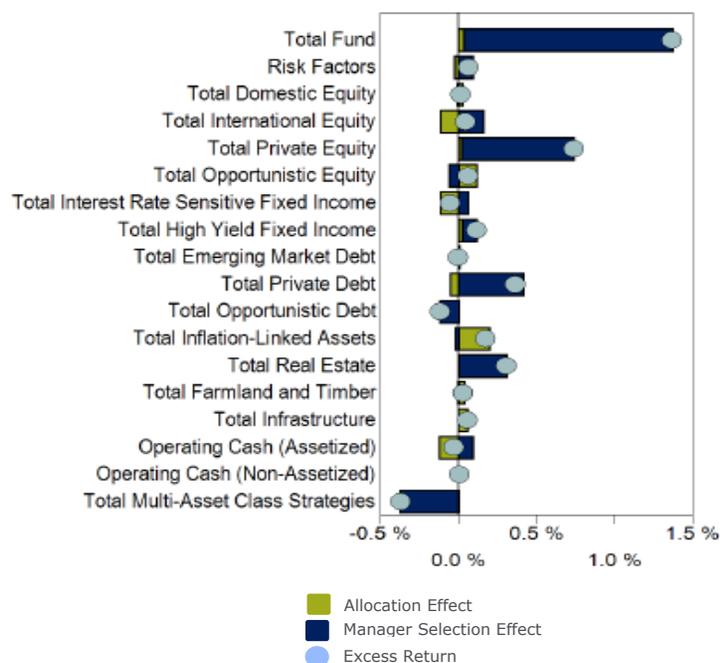
2. Manager Selection Effect: Measures the impact of over/under performance of asset classes in the portfolio relative to the asset class benchmarks in the Interim SAAP benchmark. [Weight Asset Class Benchmark × (Return Portfolio Asset Class – Return Asset Class in Interim Policy Index)] + **Interaction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

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

Arizona State Retirement System

Total Fund Attribution Detail

Attribution Effects
1 Year Ending March 31, 2016



1 Year Excess Return: +1.39%

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

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

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

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

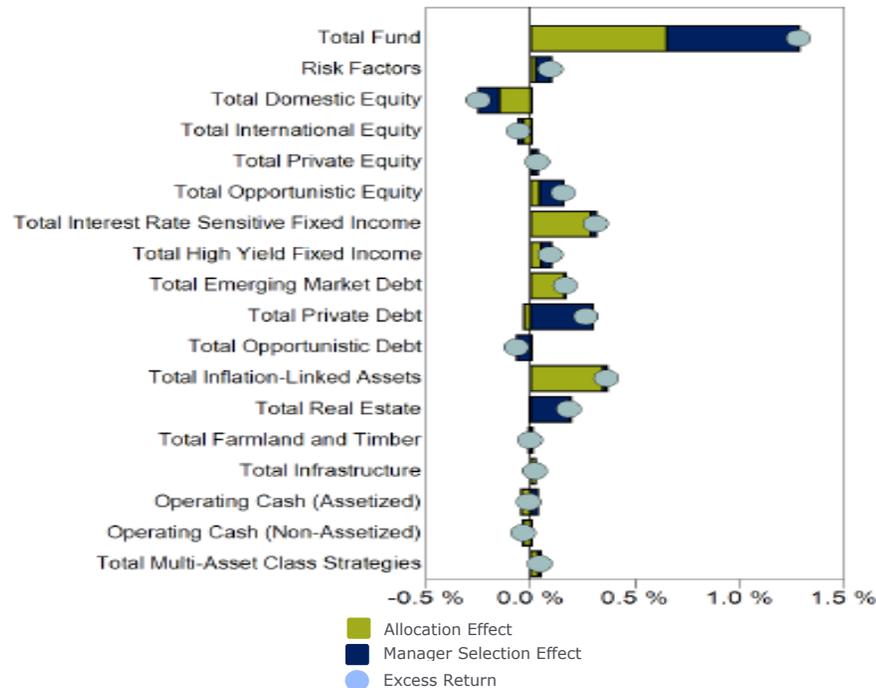
Residual: Contribution to excess return not captured in Allocation Effect and Manager Selection Effect.

Arizona State Retirement System

Total Fund Attribution Detail

Attribution Effects 3 Years Ending March 31, 2016

3 Year Excess Return: +1.26%



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

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

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

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

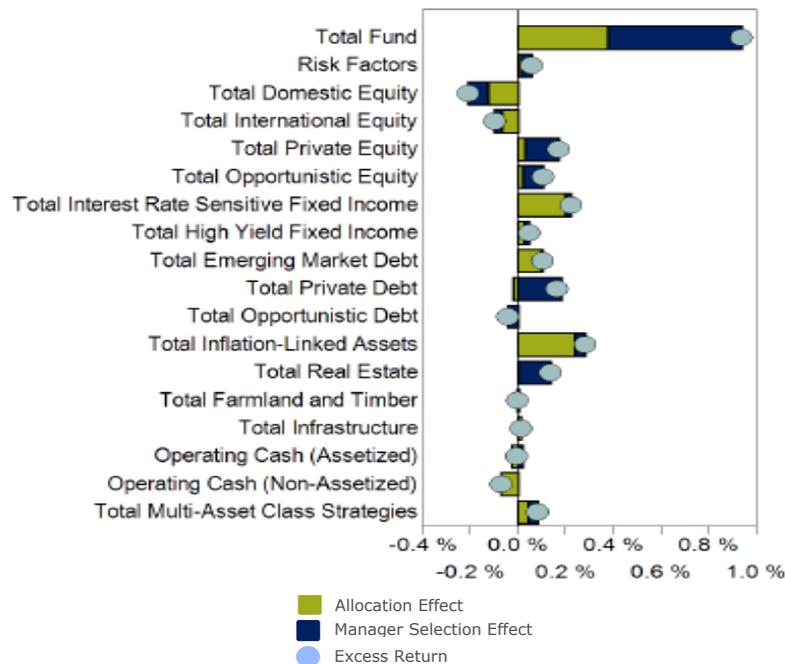
Residual: Contribution to excess return not captured in Allocation Effect and Manager Selection Effect.



Arizona State Retirement System

Total Fund Attribution Detail

Attribution Effects 5 Years Ending March 31, 2016



5 Year Excess Return: +0.89%

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

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

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

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

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

Asset Class Performance vs. Benchmark – Public Markets

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

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

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

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

**Goal Met:
Partially**

Asset Class Performance vs. Benchmark – Private Markets¹

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

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

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

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

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

**Goal Met:
Partially**



Cash Management

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

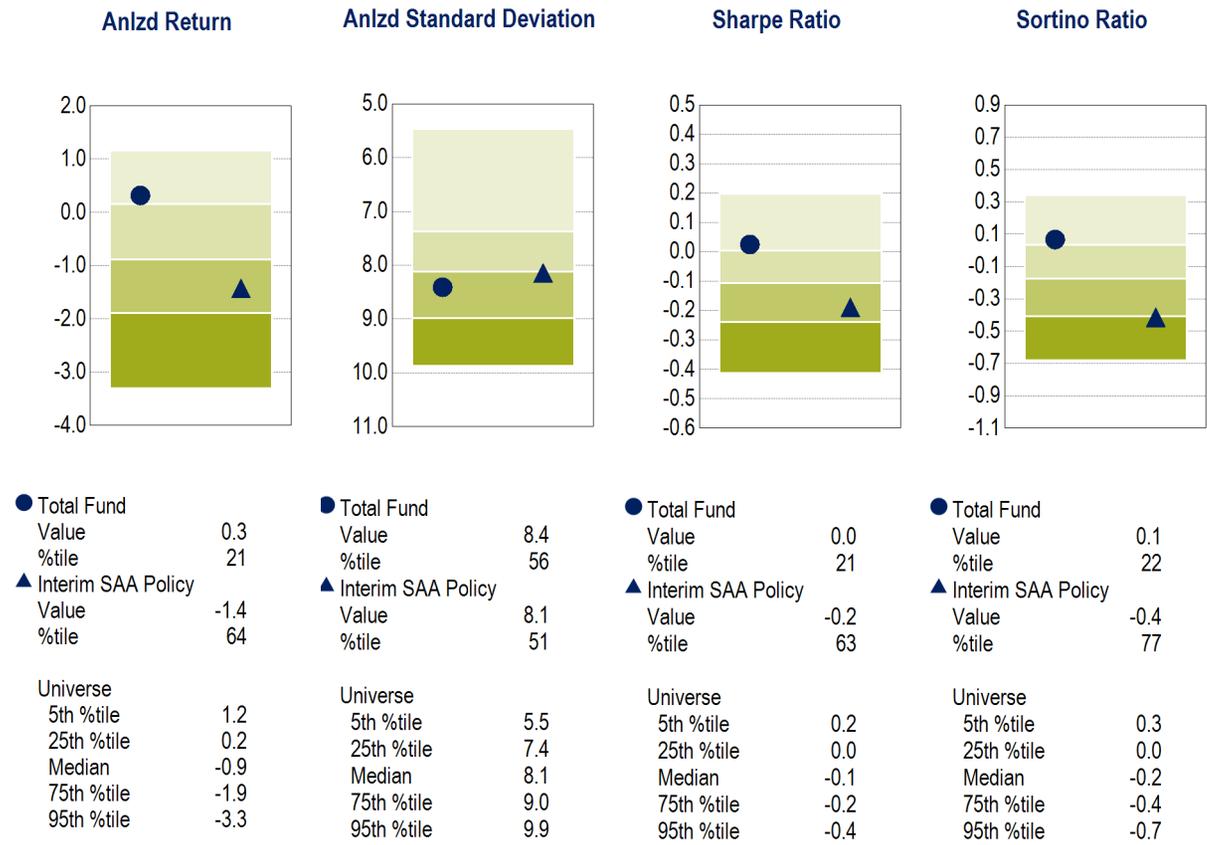
Month	External CFs	Last day of the Month Ending Balance*
Feb – 15	(\$123.2)	\$80.4
Mar – 15	(\$64.8)	\$418.0
Apr – 15	(\$90.9)	\$550.1
May – 15	(\$47.8)	\$479.0
Jun – 15	(\$74.4)	\$318.3
Jul – 15	(\$150.0)	\$405.5
Aug – 15	(\$136.3)	\$351.7
Sep – 15	(\$103.3)	\$392.0
Oct – 15	(\$73.0)	\$394.5
Nov – 15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

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

**Goal Met:
Yes**

Total Fund Risk Statistics vs. Peer Universe

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



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

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

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

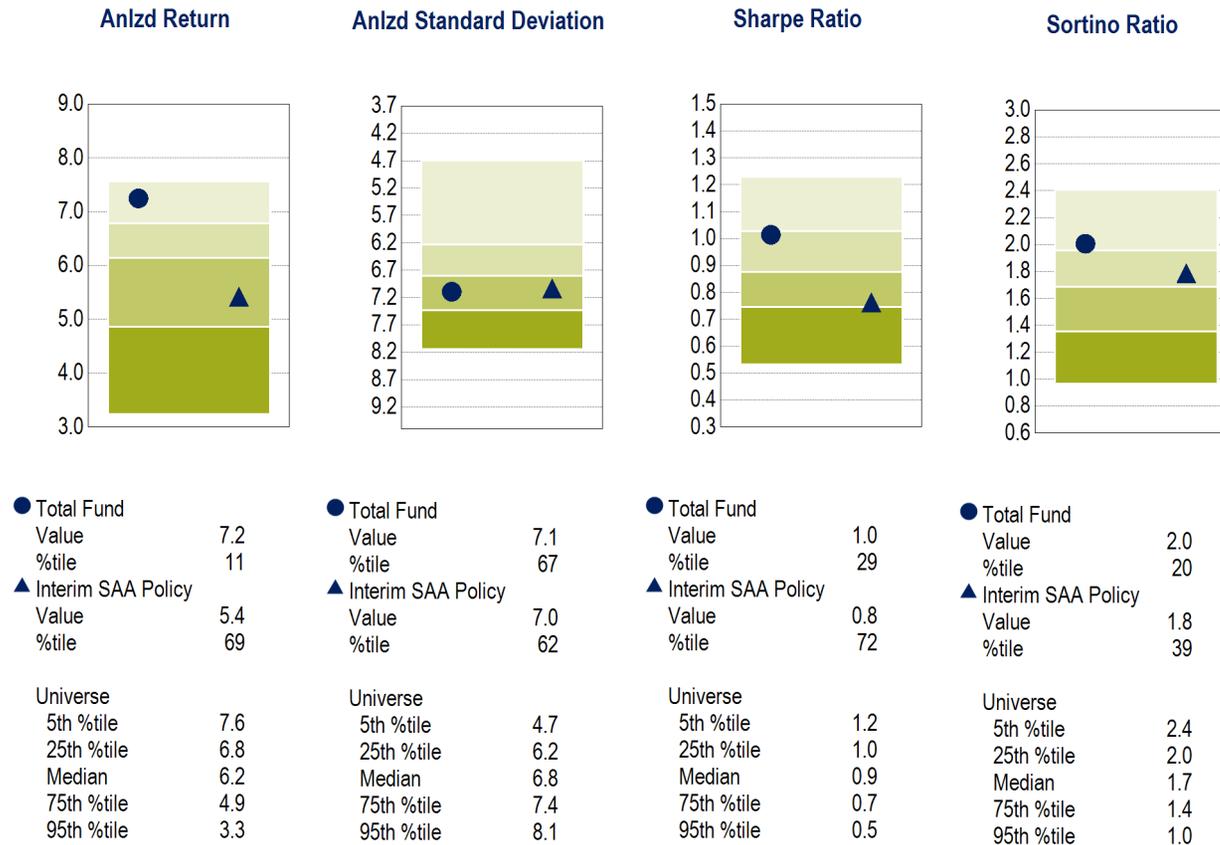
The InvestorForce Public Funds > \$1 Billion Universe contains 106 observations for the period ending March 31, 2016, with total assets of \$1.9 trillion.

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

Total Fund Risk Statistics vs. Peer Universe

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

3 Year



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

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

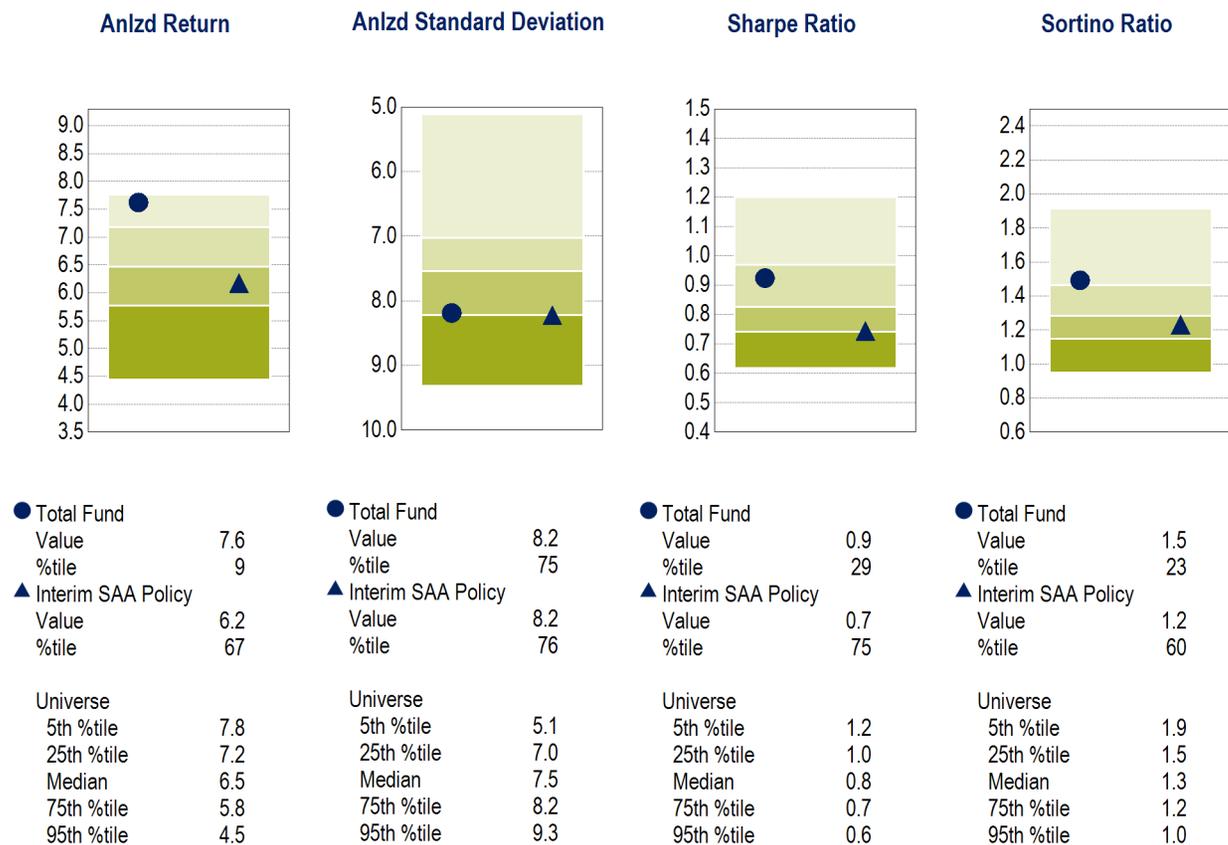
Rankings are from highest (1) to lowest (100) in the InvestorForce Public Funds > \$1 Billion Universe.

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

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

Total Fund Risk Statistics vs. Peer Universe

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



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

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

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

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

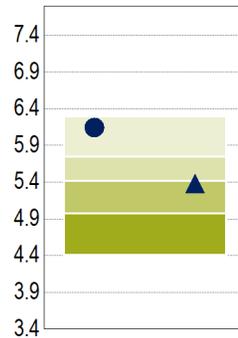
Composition of Interim SAA Policy can be found in the appendix.

Total Fund Risk Statistics vs. Peer Universe

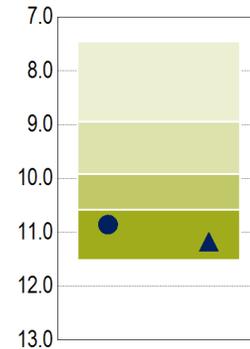
Total Fund vs. IFx Public DB > \$1B Gross(USD)(peer)

10 Year

Anlzd Return



Anlzd Standard Deviation



Sharpe Ratio



Sortino Ratio



● Total Fund

Value 6.1
%tile 7

▲ Interim SAA Policy

Value 5.4
%tile 52

Universe

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

● Total Fund

Value 10.9
%tile 86

▲ Interim SAA Policy

Value 11.2
%tile 90

Universe

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

● Total Fund

Value 0.5
%tile 33

▲ Interim SAA Policy

Value 0.4
%tile 83

Universe

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

● Total Fund

Value 0.7
%tile 33

▲ Interim SAA Policy

Value 0.6
%tile 77

Universe

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

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

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

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

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

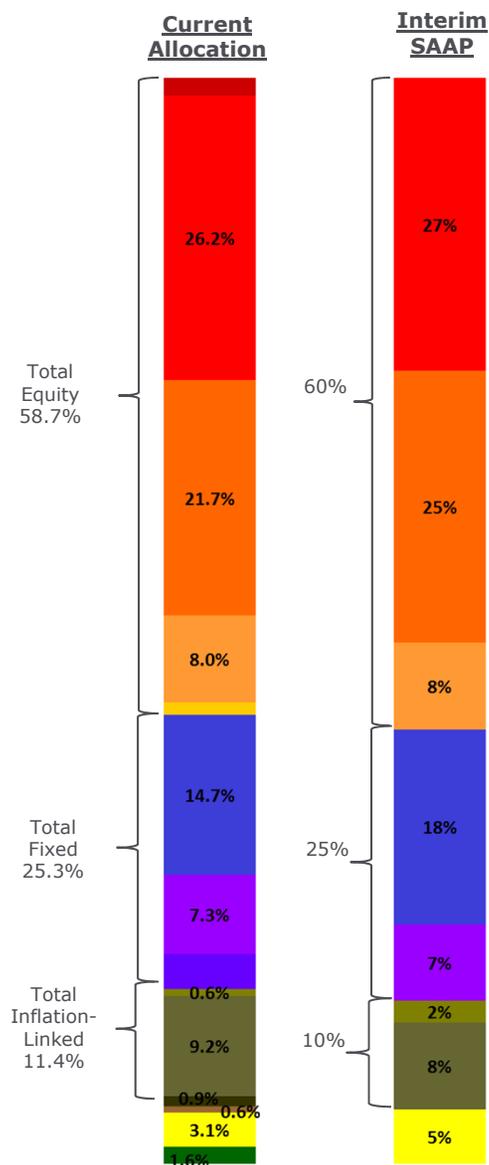
Composition of Interim SAA Policy can be found in the appendix.

Independent Oversight/Compliance

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



SAA Policy Compliance



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

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

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

³Cash includes money for the upcoming monthly pension distribution.

⁴Aggregate Opportunistic asset classes not to exceed 10%.

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

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

Market values include manager held cash.

Arizona State Retirement System

Asset Class Performance Summary - Public Markets

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

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

NEPC began calculating Total Domestic and International Equity performance in January 2009. Monthly performance data from January 1998 - December 2008 was provided by State Street.

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

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

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

Arizona State Retirement System

Asset Class Performance Summary - Private Markets

	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Inception (%)	Since		
Total Fund	33,729,963,270	100.0	1.4	--	0.0	--	6.7	7.1	9.7	Jul-75
<i>Interim SAA Policy</i>			<u>1.4</u>	--	<u>-1.4</u>	--	<u>5.4</u>	--	<u>6.2</u>	<i>Jul-75</i>
Over/Under			0.0	1.4	1.3	0.9	0.3			
<i>Actual Benchmark</i>			1.4	--	<u>-1.3</u>	--	<u>6.0</u>	--	<u>6.5</u>	<i>Jul-75</i>
Total Private Equity	2,622,714,403	7.8	1.0	5.5	11.0	12.5	11.0	11.0	11.0	Oct-07
<i>Russell 2000 1 QTR Lagged</i>			<u>3.2</u>	<u>-5.9</u>	<u>9.3</u>	<u>8.1</u>	<u>9.7</u>	<u>9.7</u>	<u>9.7</u>	<i>Oct-07</i>
Over/Under			-2.2	11.4	1.7	4.4	1.3			
Total Opportunistic Equity¹	509,891,102	1.5	3.7	3.8	22.2		23.1		23.1	Apr-11
Total Private Debt	2,381,652,235	7.1	1.9	8.5	10.7		10.9		10.9	Jul-12
<i>S&P/LSTA Leveraged Loan Index + 250 bps 1 QTR Lagged</i>			<u>-1.5</u>	<u>1.1</u>	<u>3.1</u>	--	<u>3.3</u>		<u>3.3</u>	<i>Jul-12</i>
Over/Under			3.4	7.4	7.6	--	7.6		7.6	
Total Opportunistic Debt¹	1,117,282,802	3.3	-3.7	-3.1	4.2	5.5	9.3		9.3	Jan-08
Total Real Estate	2,961,890,110	8.8	8.2	14.9	14.5	14.0	8.1		8.1	Oct-05
<i>NCREIF ODCE 1 QTR Lagged (net)</i>			<u>3.4</u>	<u>14.3</u>	<u>12.9</u>	<u>12.7</u>	<u>7.0</u>		<u>7.0</u>	<i>Oct-05</i>
Over/Under			4.8	0.6	1.6	1.3	1.1		1.1	
Total Farmland and Timber	188,451,439	0.6	3.1	4.5			4.3		4.3	Jul-13
<i>CPI ex-Food and Energy + 350 bps 1 QTR Lagged</i>			<u>1.4</u>	<u>5.7</u>	--	--	<u>5.5</u>		<u>5.5</u>	<i>Jul-13</i>
Over/Under			1.7	-1.2	--	--	-1.2		-1.2	
Total Infrastructure	316,552,244	0.9	0.6	5.3			5.1		5.1	Dec-14
<i>CPI ex-Food and Energy + 350 bps 1 QTR Lagged</i>			<u>1.4</u>	<u>5.7</u>	--	--	<u>5.5</u>		<u>5.5</u>	<i>Dec-14</i>
Over/Under			-0.8	-0.4	--	--	-0.4		-0.4	

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

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

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

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

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

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

Arizona State Retirement System

Public Market Asset Class Analysis

3 Years Ending March 31, 2016

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

Note: Performance is reported net of fees.

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

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

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

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

Arizona State Retirement System

Public Market Asset Class Analysis

5 Years Ending March 31, 2016

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

Note: Performance is reported net of fees.

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

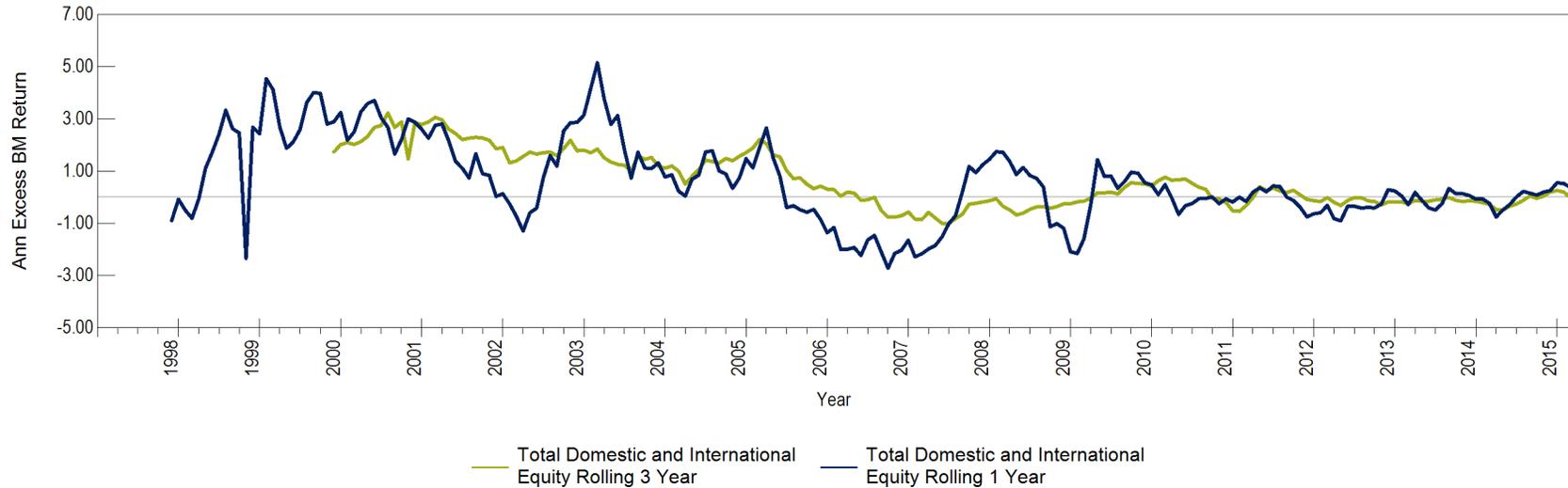
Ranks for statistics shown above are based on the respective universe against which the portfolio is ranked on the asset class performance summary that precedes this section of the analysis.

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

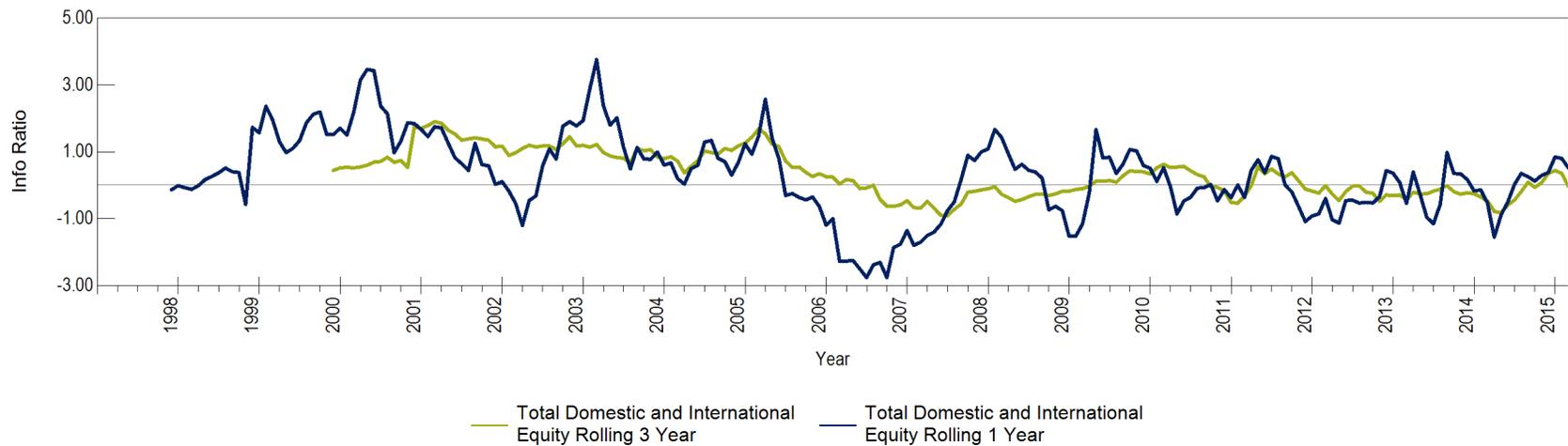
Composition of Interim SAA Policy and ASRS Custom Benchmarks can be found in the appendix.

Asset Class Analysis - Total Domestic and International Equity

Rolling Annual Excess Benchmark Return

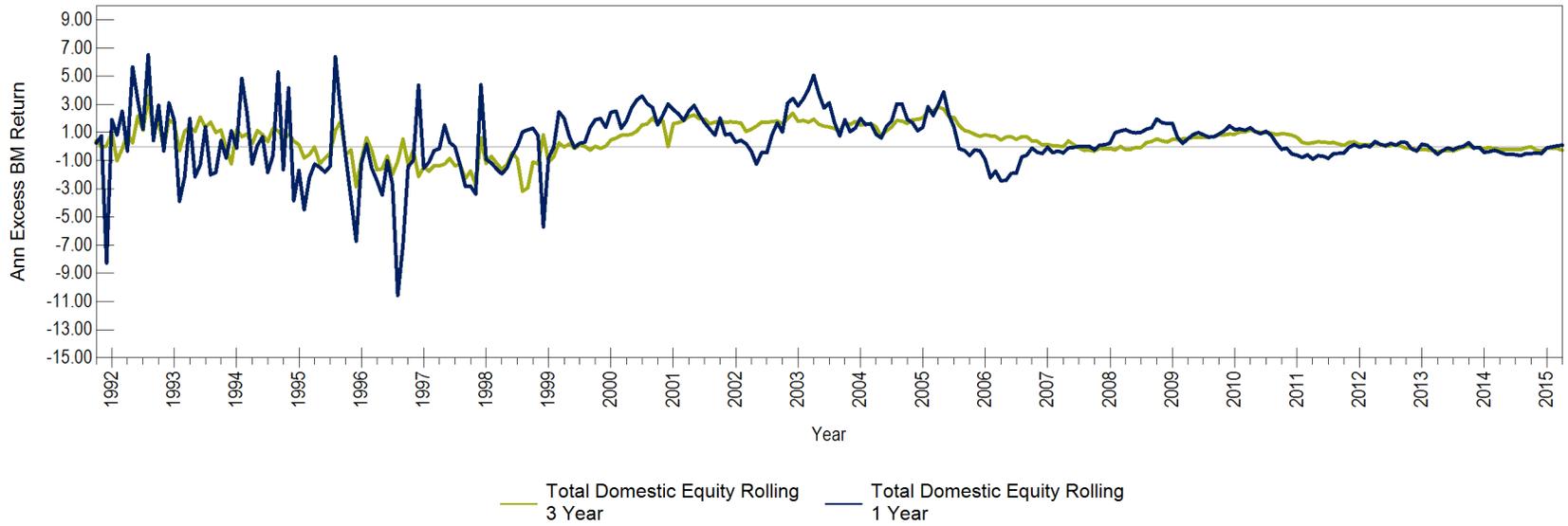


Rolling Information Ratio

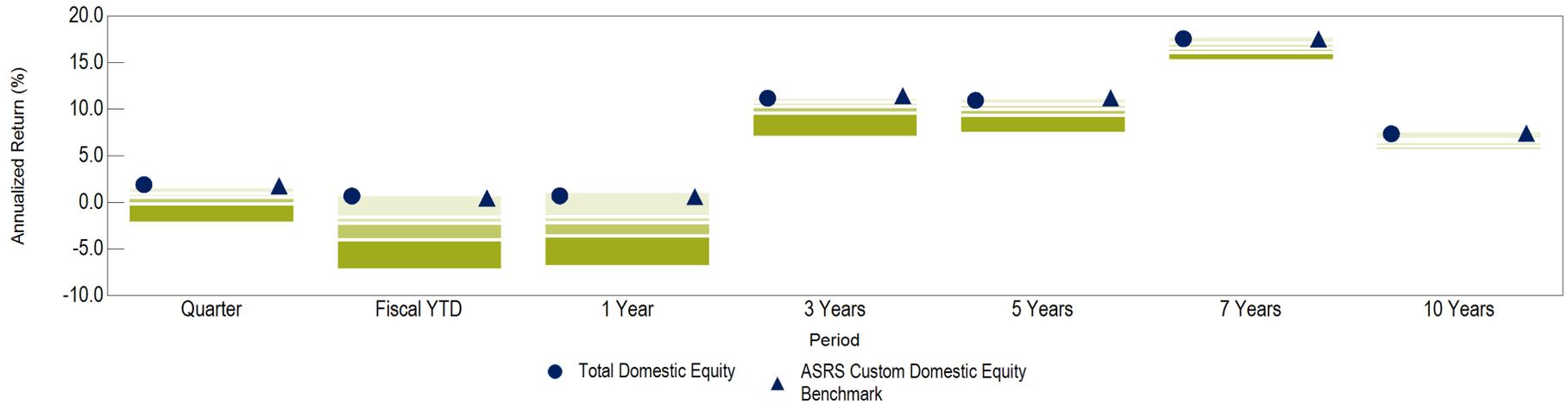


Asset Class Analysis - Total Domestic Equity

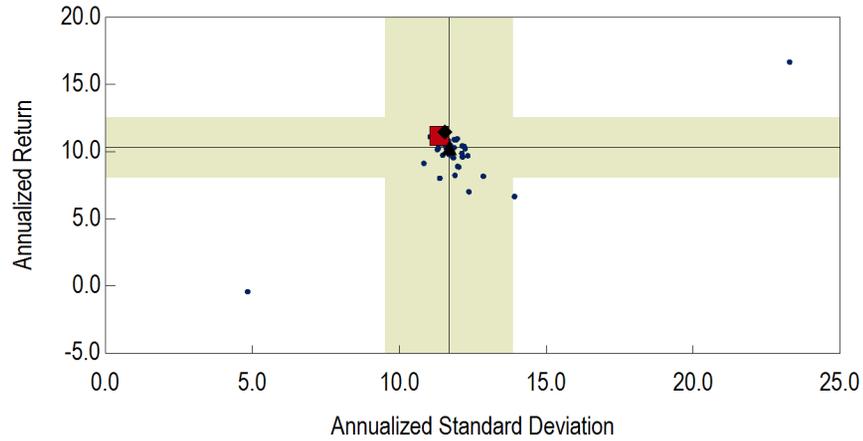
Rolling Annual Excess Benchmark Return



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

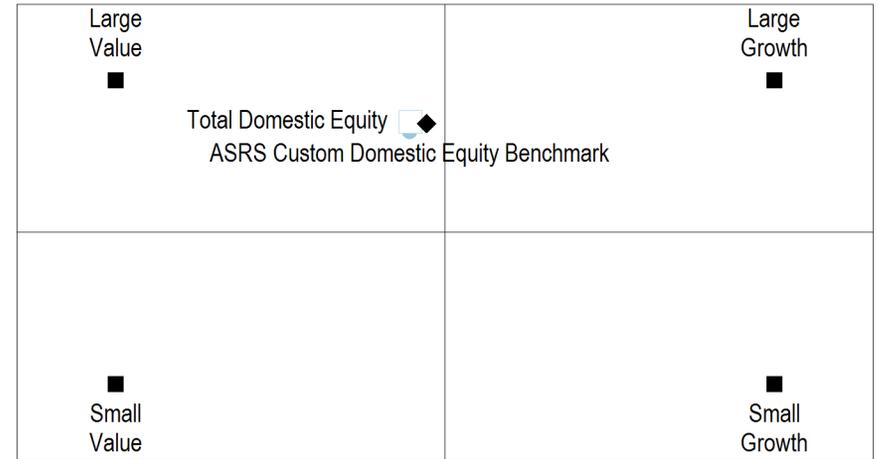


3 Year Risk Return

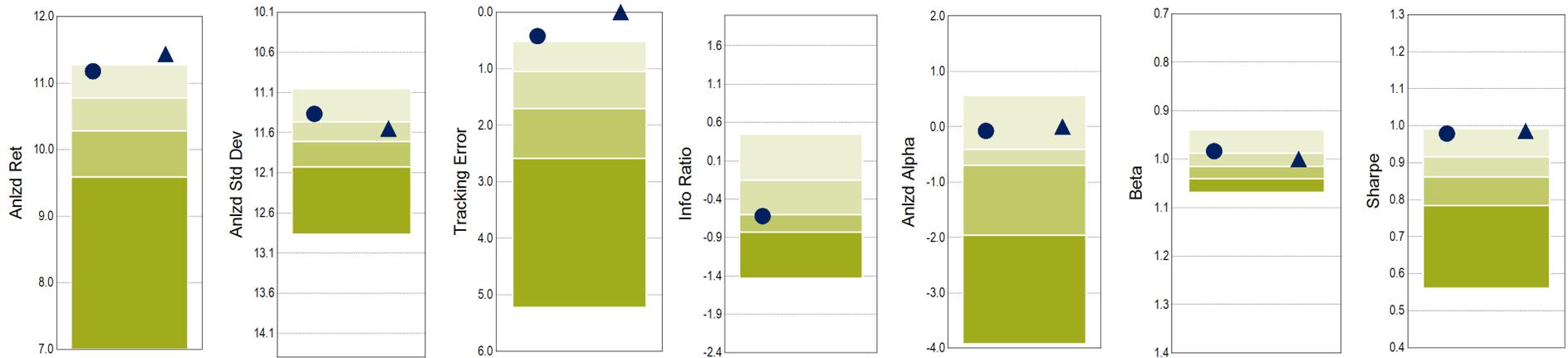


- Total Domestic Equity
- ◆ ASRS Custom Domestic Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion US Equity Net

3 Year Style Map



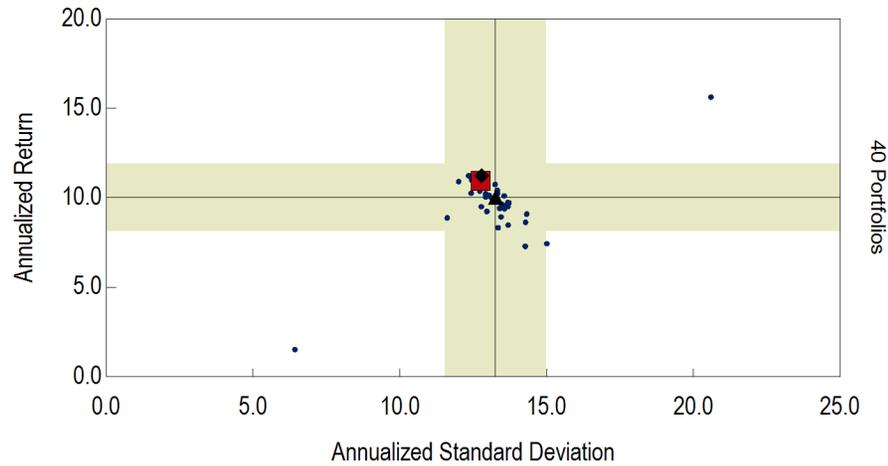
- First Rolling Period
- ◆ Last Rolling Period



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

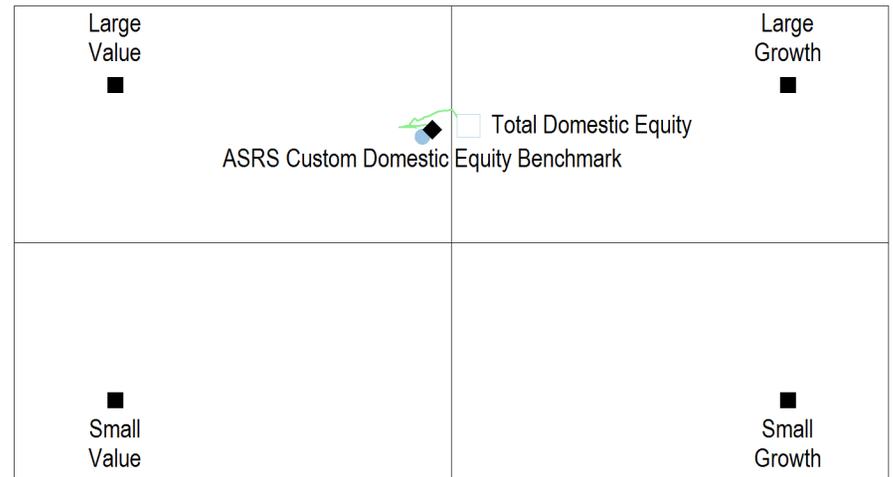
Asset Class Analysis - Total Domestic Equity

5 Year Risk Return

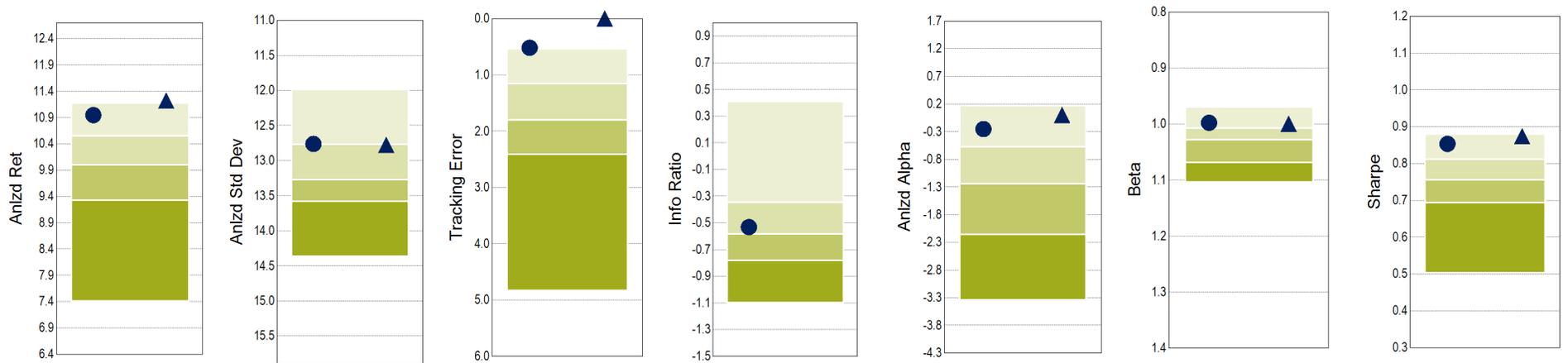


- Total Domestic Equity
- ◆ ASRS Custom Domestic Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion US Equity Net

5 Year Style Map



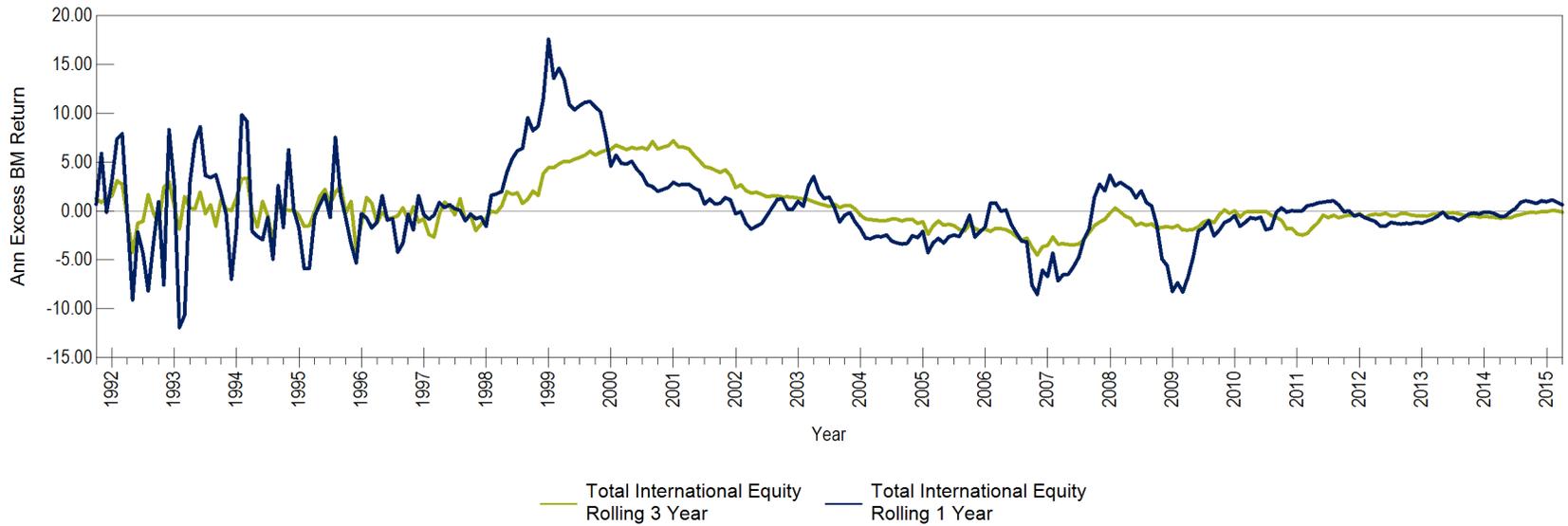
- First Rolling Period
- ◆ Last Rolling Period



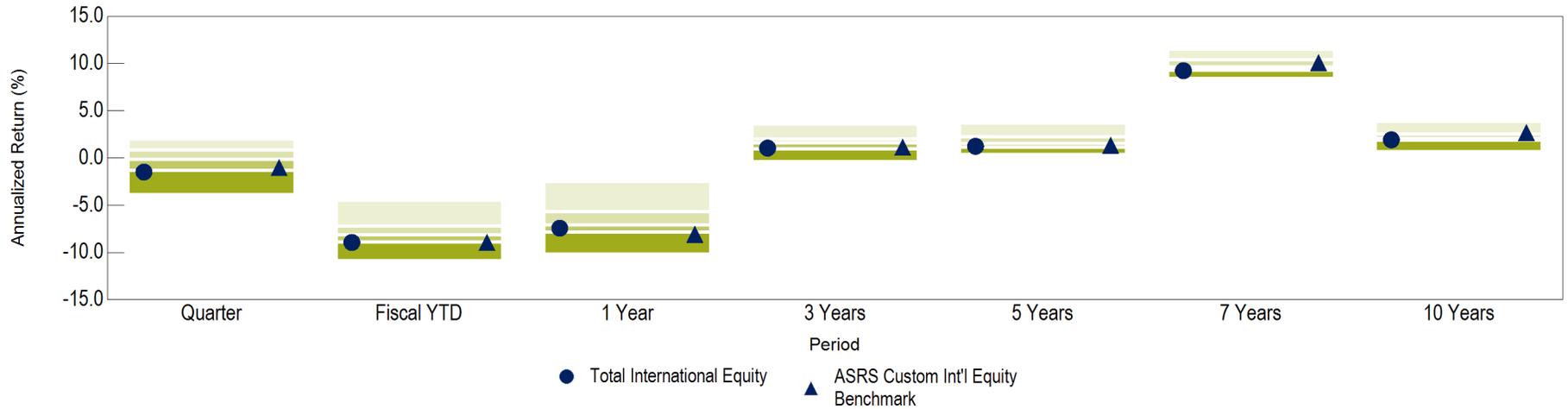
- Total Domestic Equity
- ▲ ASRS Custom Domestic Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

Asset Class Analysis - Total International Equity

Rolling Annual Excess Benchmark Return

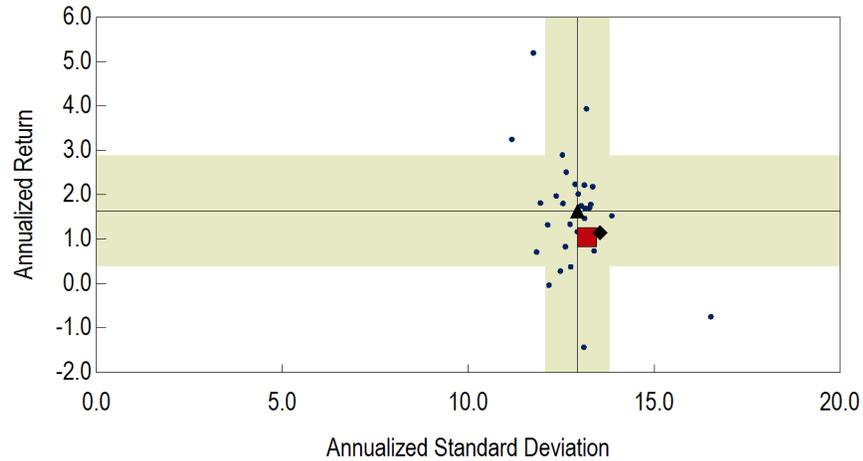


InvestorForce Public DB > \$1 Billion Global ex-US Equity Net Accounts



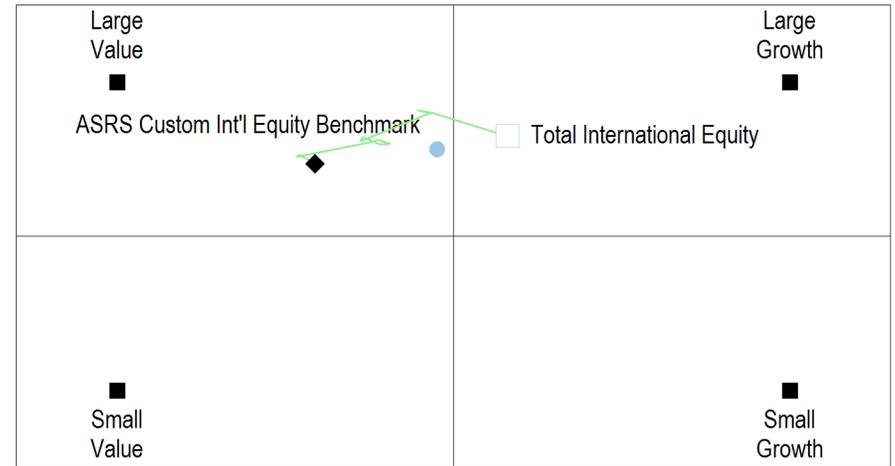
Asset Class Analysis - Total International Equity

3 Year Risk Return

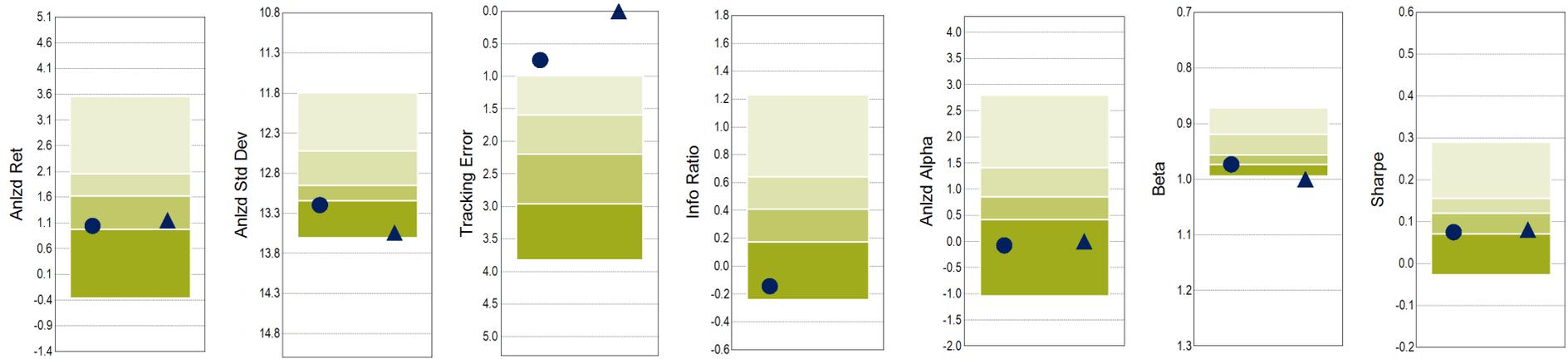


- Total International Equity
- ◆ ASRS Custom Int'l Equity Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Global ex-US Equity Net

3 Year Style Map

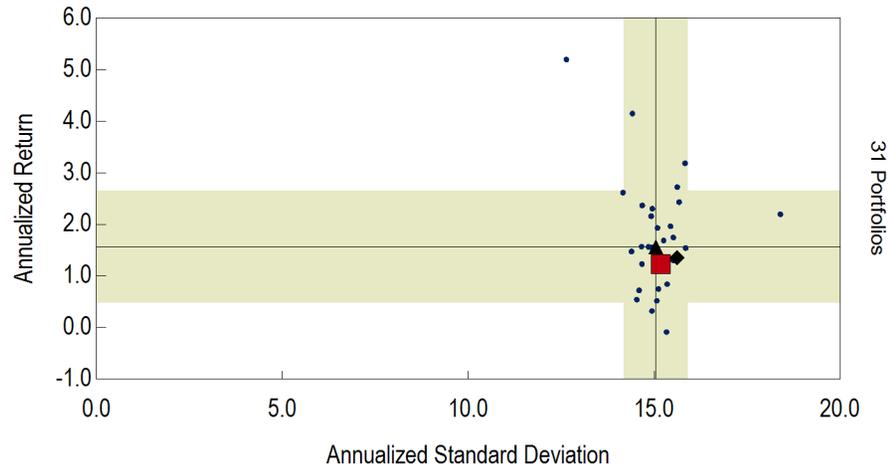


- First Rolling Period
- ◆ Last Rolling Period



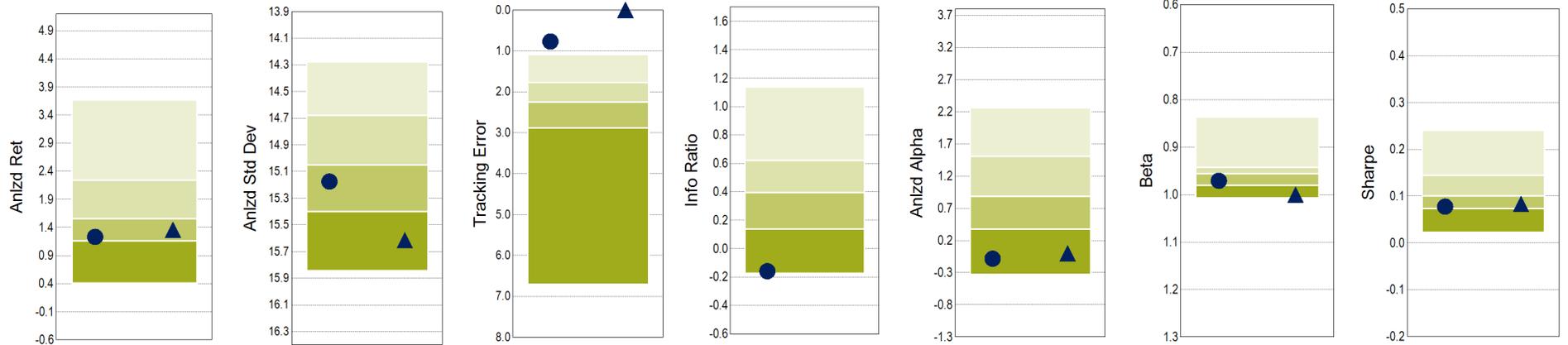
- Total International Equity
- ▲ ASRS Custom Int'l Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile

5 Year Risk Return



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

5 Year Style Map

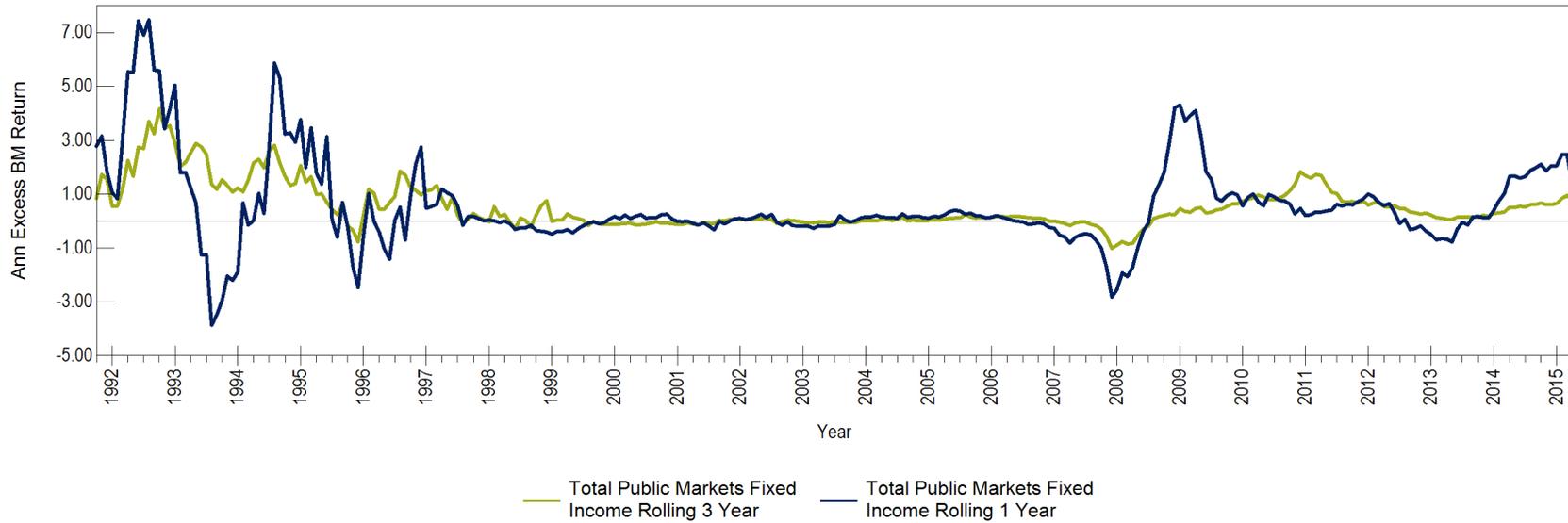


- Total International Equity
- ▲ ASRS Custom Int'l Equity Benchmark
- 5th to 25th Percentile
- 25th to Median
- Median to 75th Percentile
- 75th to 95th Percentile



Asset Class Analysis - Total Public Markets Fixed Income

Rolling Annual Excess Benchmark Return

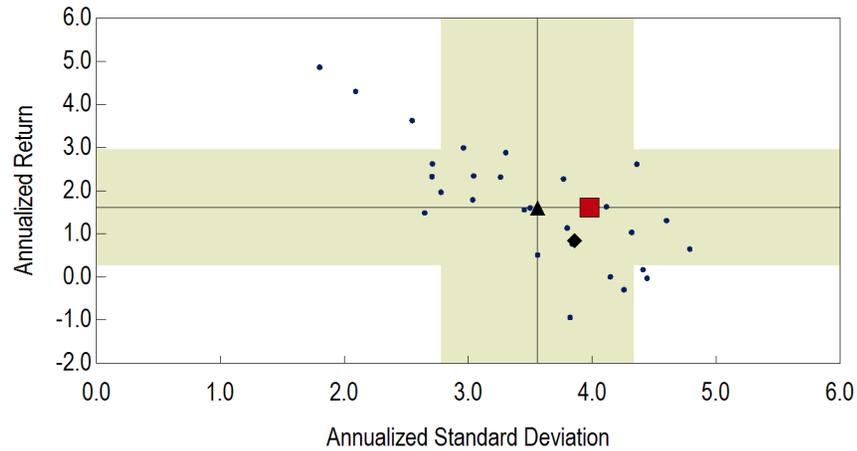


InvestorForce Public DB > \$1 Billion Fixed Income Net Accounts



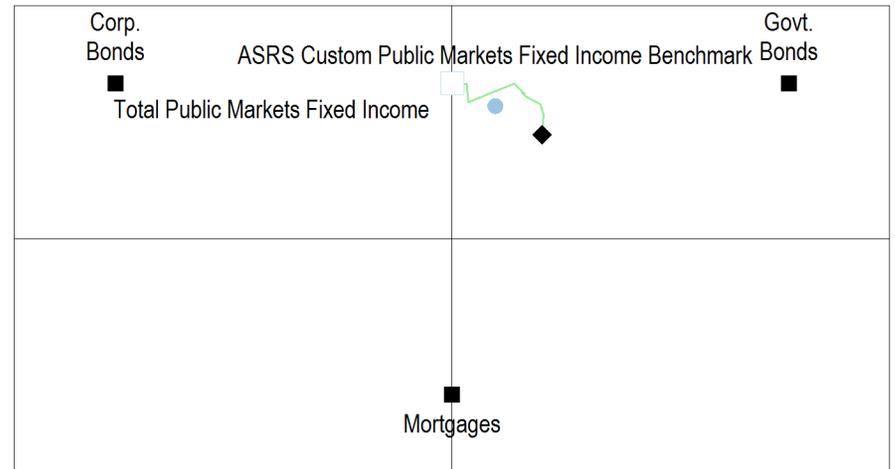
Asset Class Analysis - Total Public Markets Fixed Income

3 Year Risk Return

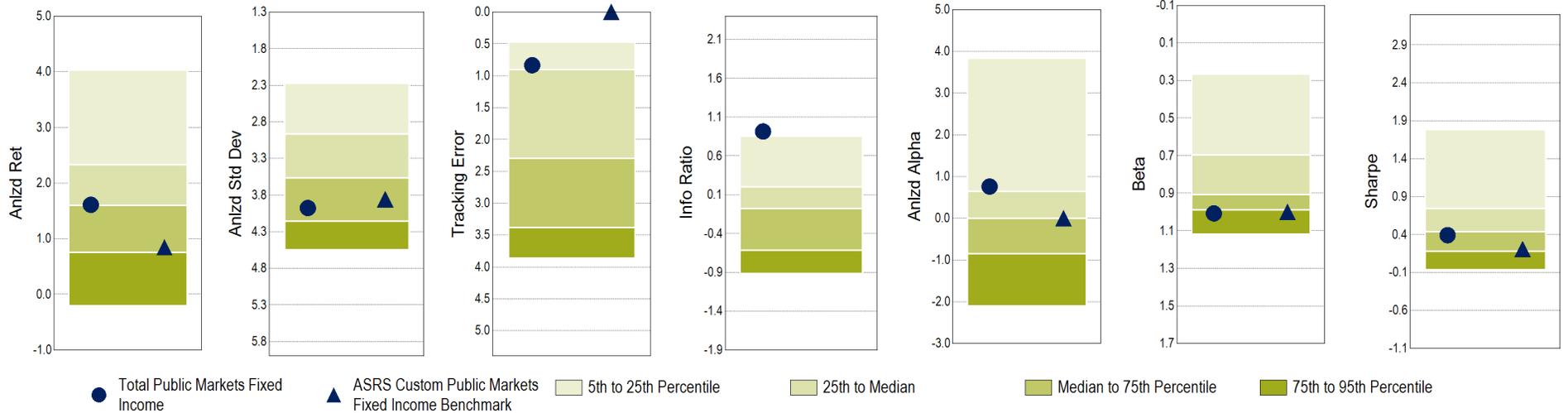


- Total Public Markets Fixed Income
- ◆ ASRS Custom Public Markets Fixed Income Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Fixed Income Net

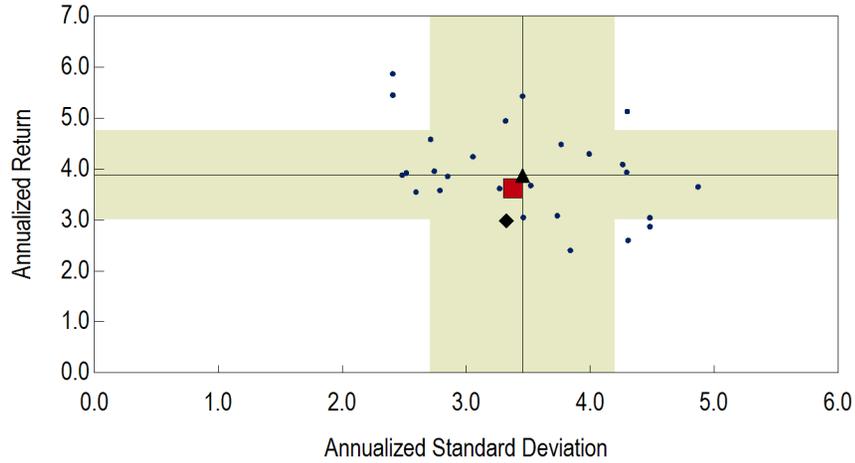
3 Year Style Map



- First Rolling Period
- ◆ Last Rolling Period

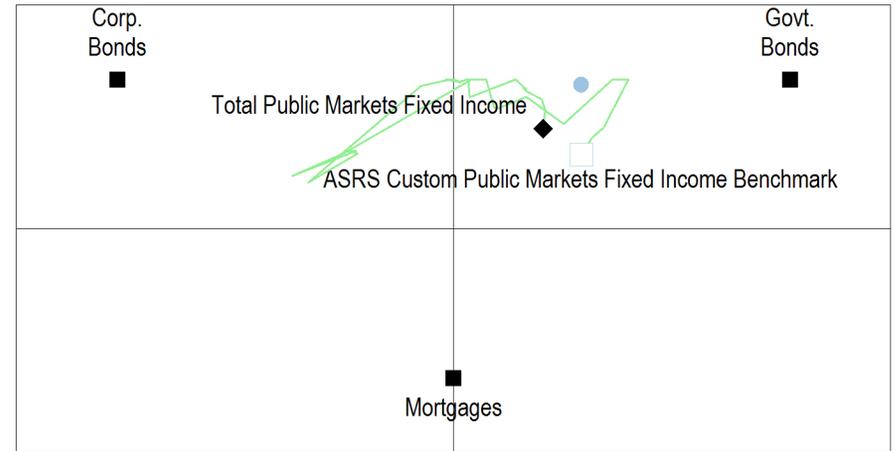


5 Year Risk Return

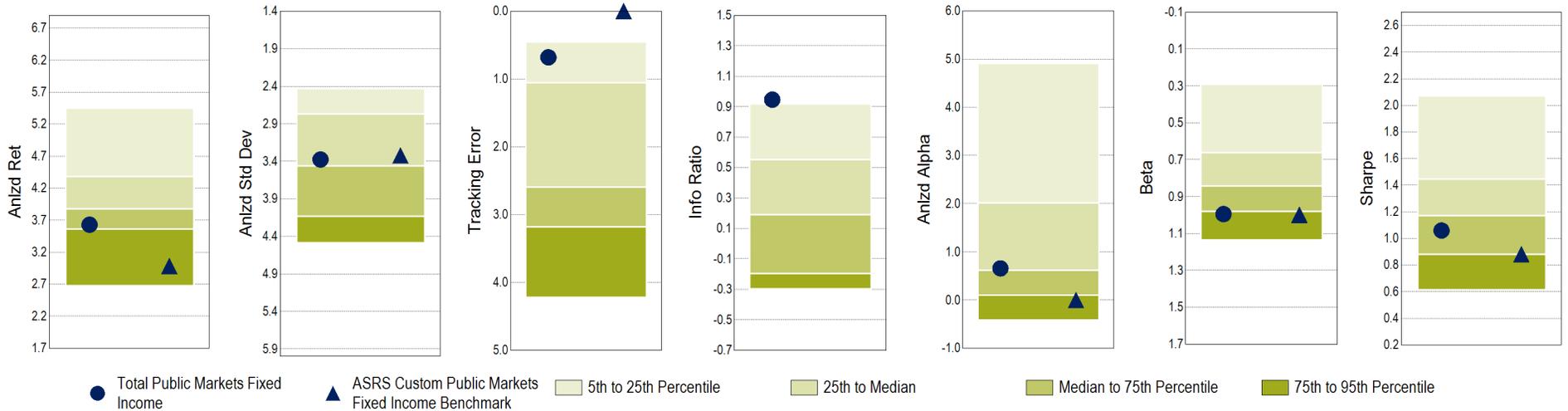


- Total Public Markets Fixed Income
- ◆ ASRS Custom Public Markets Fixed Income Benchmark
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB > \$1 Billion Fixed Income Net

5 Year Style Map

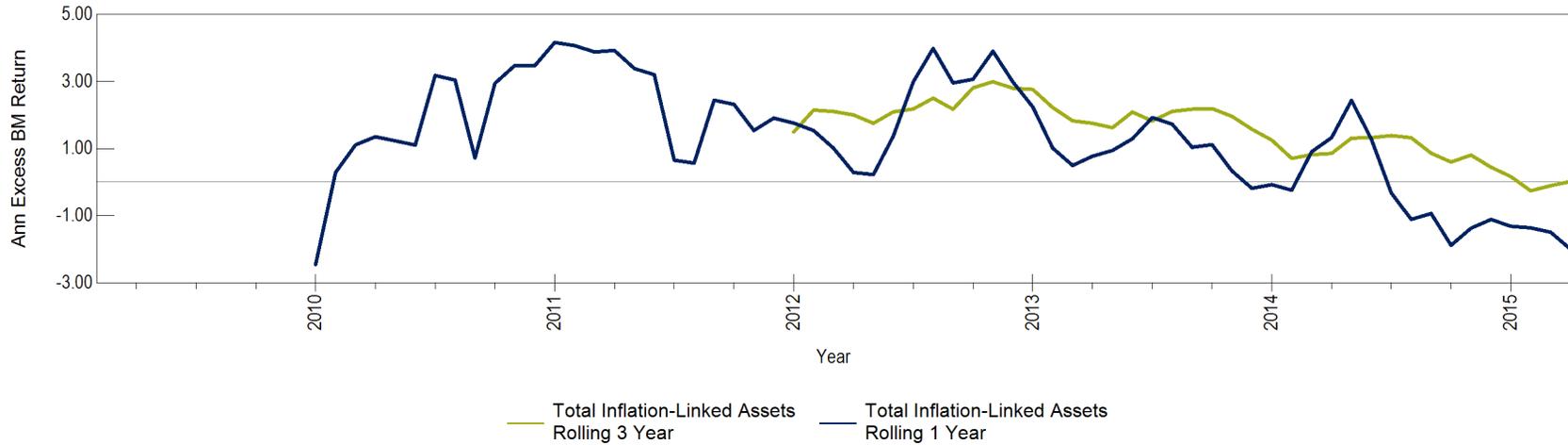


- First Rolling Period
- ◆ Last Rolling Period

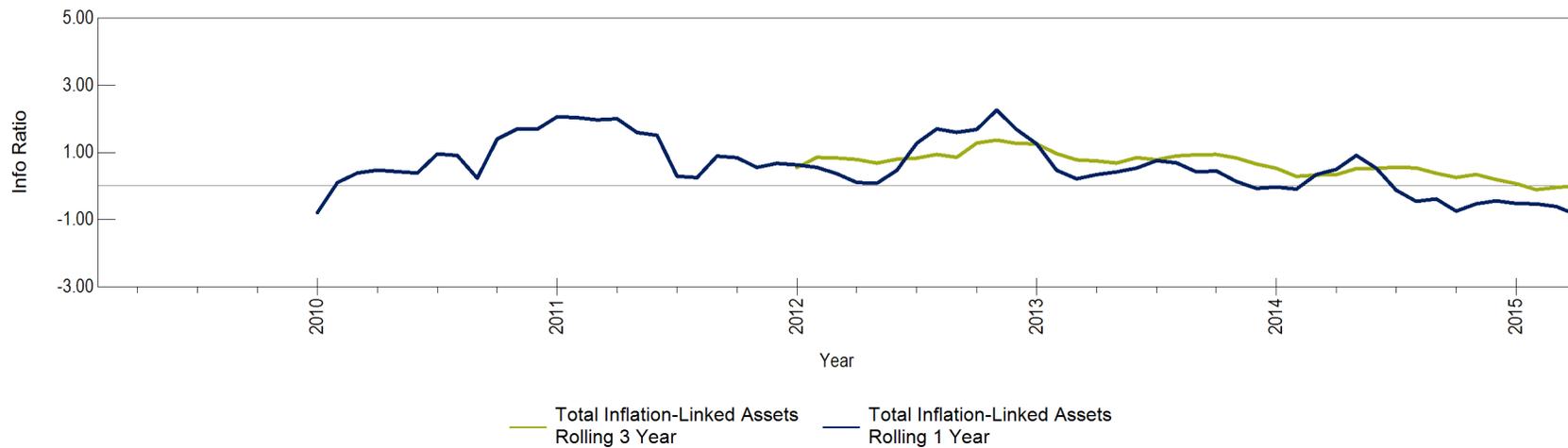


Asset Class Analysis - Total Inflation-Linked Assets

Rolling Annual Excess Benchmark Return

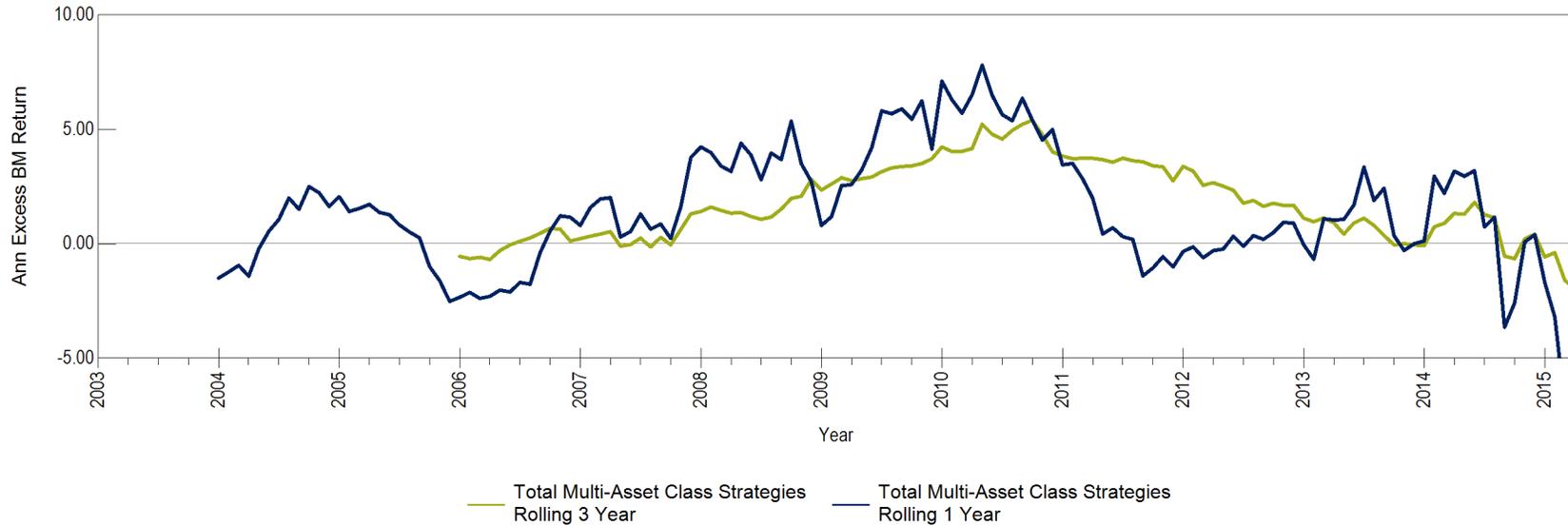


Rolling Information Ratio

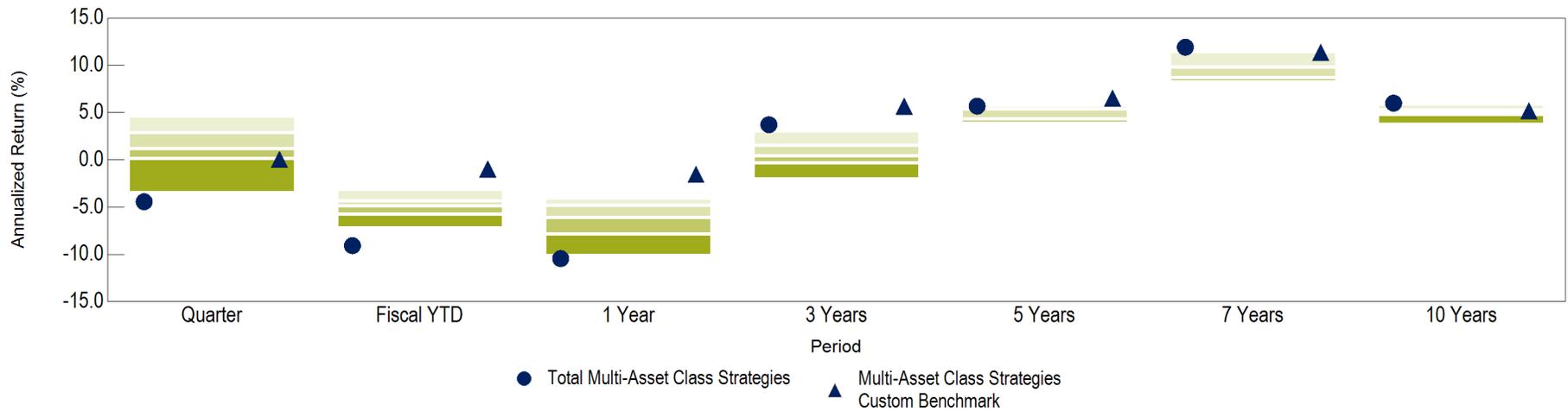


Asset Class Analysis - Total Multi-Asset Class Strategies

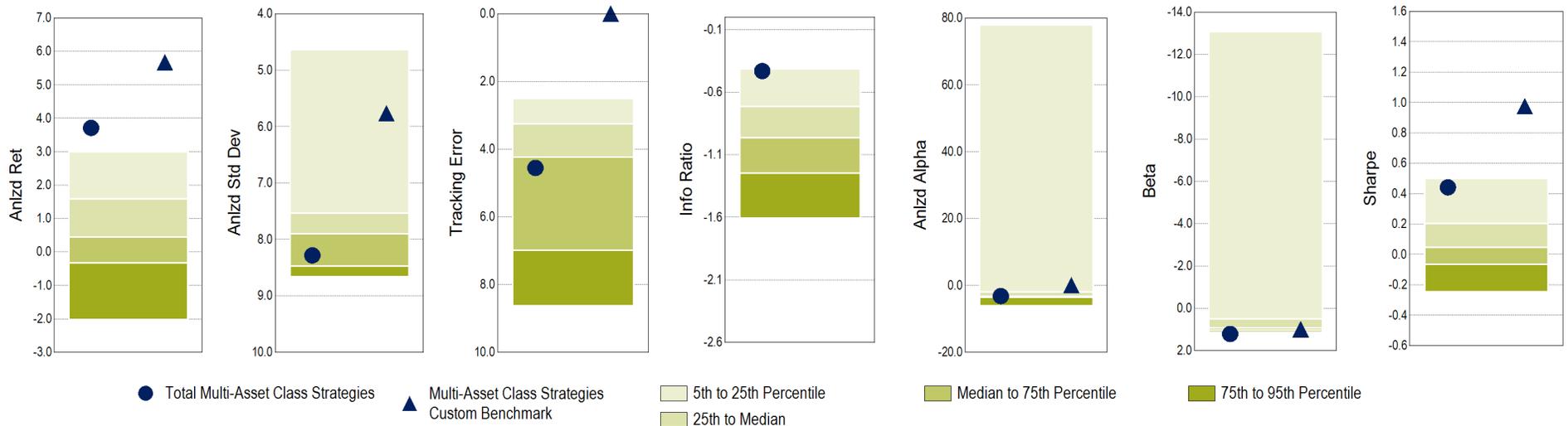
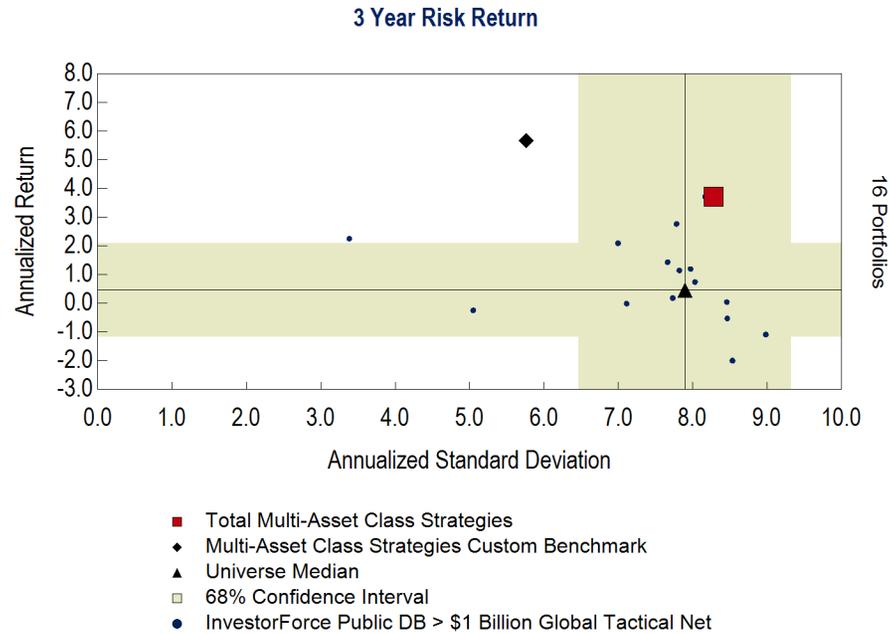
Rolling Annual Excess Benchmark Return



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

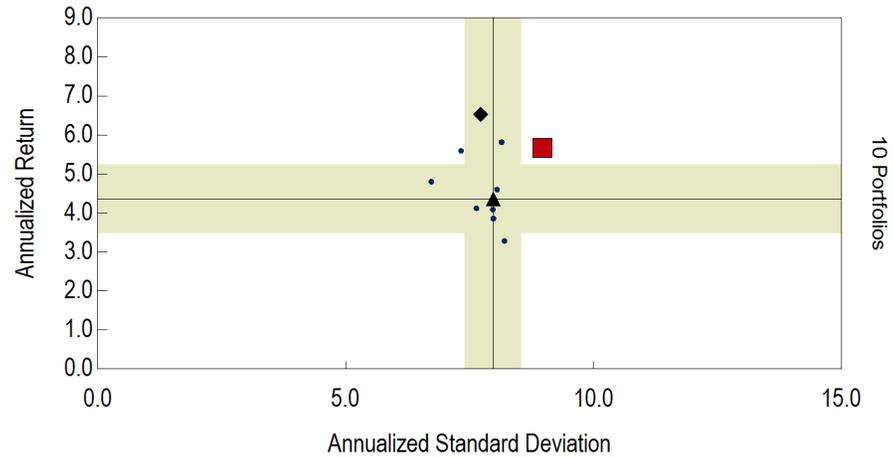


Asset Class Analysis - Total Multi-Asset Class Strategies

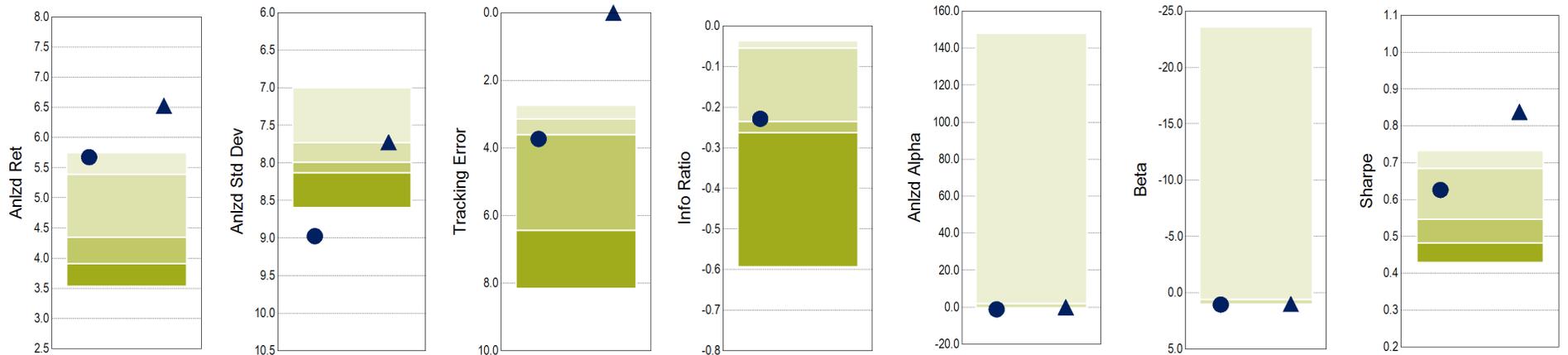


Asset Class Analysis - Total Multi-Asset Class Strategies

5 Year Risk Return



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



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

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

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

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

General Observations

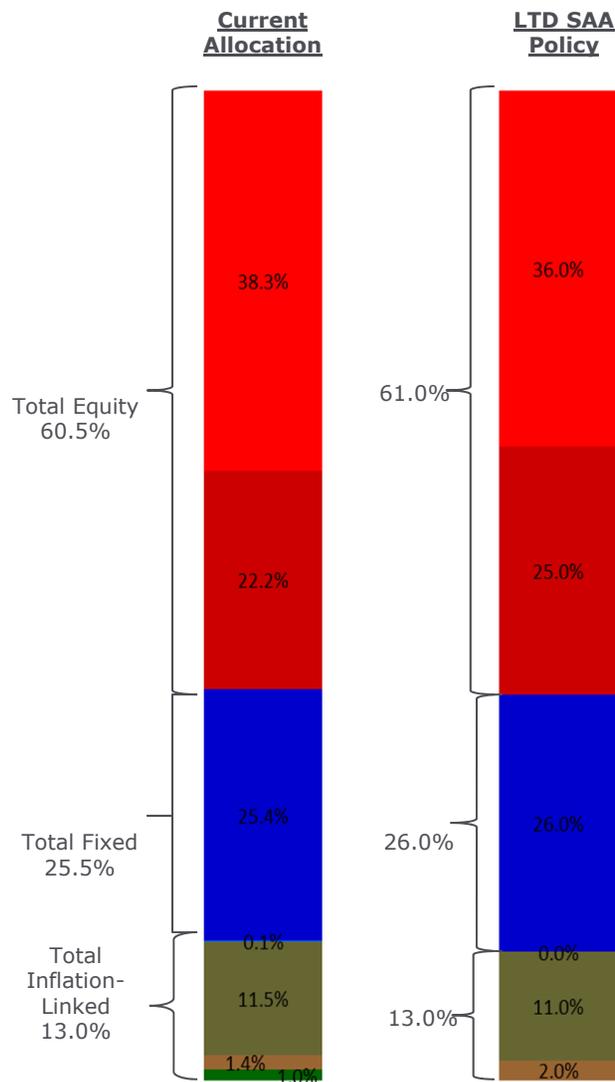
- **The Fund continues to make significant progress moving the portfolio from the Interim SAAP toward the long-term SAAP. New long-term SAAP adopted as of April 1, 2015.**
 - Current Interim SAAP includes proration of 3% Private Debt and 2% Real Estate, which are unfunded.
 - Continued build out of private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

Independent Oversight/Compliance: LTD

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



Long Term Disability SAAP Policy Compliance



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

¹Cash includes money for the upcoming monthly pension distribution.

Note: Market values include manager held cash.

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

Long Term Disability Performance Summary

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

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

Market Environment Update and Outlook

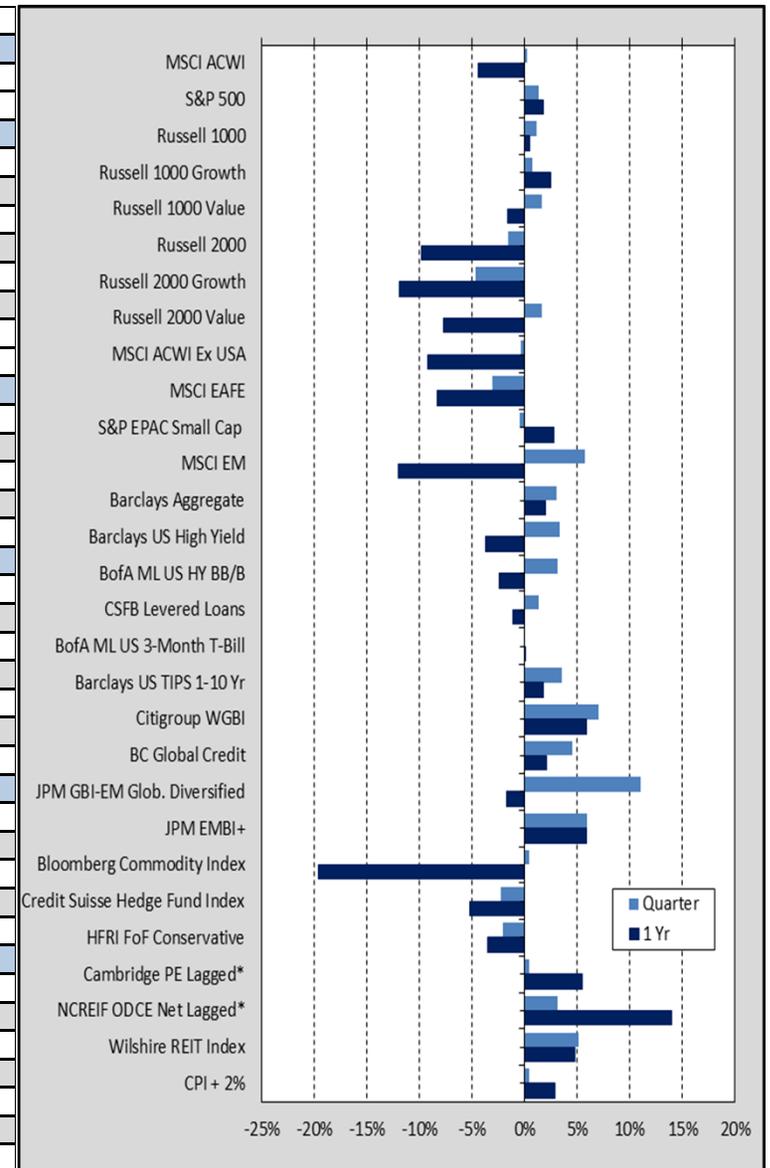


Economic Environment

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

Market Environment – Q1 2016 Overview

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



* As of 12/31/2015

Global Equity

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

Private Equity

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

Fixed Income

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

Real Assets/Inflation-Linked Assets

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

Commodities

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

Real Estate

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

Highlights of First Quarter Happenings at NEPC

NEPC Research

Recent White Papers

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

Upcoming Events

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

NEPC Client Recognitions

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

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



NEPC Client Recognitions (continued)

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

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

Appendix: SAA Policy History



Strategic Asset Allocation Policy (SAAP) History

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

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

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

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



ASRS Custom Asset Class Benchmark History

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

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

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

**Confidential
Meeting
Materials
Removed**

Agenda Item #8

**Confidential
Meeting
Materials
Removed**

Agenda Item #9

**Confidential
Meeting
Materials
Removed**

Agenda Item #10

Arizona State Retirement System

Investment Committee

Fixed Income Asset Class Review

June 20, 2016



EXECUTIVE SUMMARY

Arizona State Retirement System

Fixed Income Asset Class Overview

- **Market Value as of May 31, 2016:**

- **\$8.8 B**

- **Passive Allocation: 45.4%**

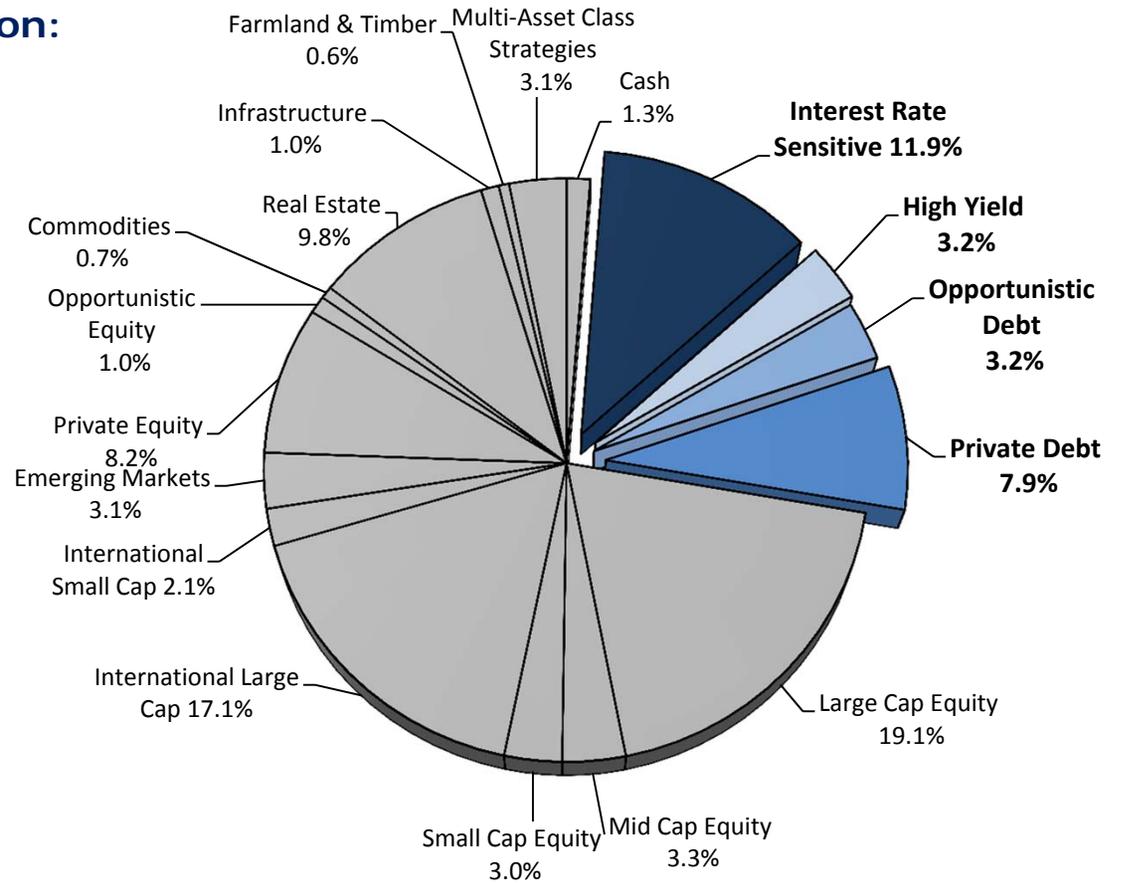
- **Fixed Income Style Composition:**

- Interest Rate Sensitive: 45.4%
 - High Yield: 12.2%
 - Private Debt: 30.1%
 - Opportunistic Debt: 12.3%

- **Portfolios:**

- 3 Passive
 - Core: 2
 - Treasuries (Long) 1
 - 23 Active
 - HY: 2
 - Private Debt: 11
 - Opportunistic Debt: 10

Total Fund: \$33.4 B
 U.S. Fixed Income SAAP
 Policy: 25%
 Range: 18-35%
 Actual: 26.3%



Arizona State Retirement System

Total Fixed Income Performance Summary as of March 31, 2016

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Total Public Markets Fixed Income	4,965,178,558	14.7	3.4	28	3.0	24	1.8	26	1.6	57	3.6	71	5.0	62	8.2	Jul-75
<i>ASRS Custom Public Markets Fixed Income Benchmark</i>			<u>3.1</u>	36	<u>1.7</u>	38	<u>0.5</u>	53	<u>0.8</u>	74	<u>3.0</u>	90	<u>4.5</u>	85	--	<i>Jul-75</i>
Over/Under			0.3		1.3		1.3		0.8		0.6		0.5			
	Market Value (\$)	% of Portfolio	3 Mo (%)		1 Yr (%)		3 Yrs (%)		5 Yrs (%)		Inception (%)		Since			
Total Private Debt	2,381,652,235	7.1	1.9		8.5		10.7		10.9		10.9		Jul-12			
<i>S&P/LSTA Leveraged Loan Index + 250 bps 1 QTR Lagged</i>			<u>-1.5</u>		<u>1.1</u>		<u>3.1</u>		<u>3.3</u>		<u>3.3</u>		<i>Jul-12</i>			
Over/Under			3.4		7.4		7.6		7.6		7.6					
	Market Value (\$)	% of Portfolio	3 Mo (%)		1 Yr (%)		3 Yrs (%)		5 Yrs (%)		Inception (%)		Since			
Total Opportunistic Debt	1,117,282,802	3.3	-3.7		-3.1		4.2		5.5		9.3		Jan-08			

- ASRS Custom Public Markets Fixed Income Benchmark** was Barclays Capital U.S. Aggregate Index through 12/31/2010; 93% Barclays Capital U.S. Aggregate Index, 7% Barclays Capital U.S. High Yield Bond Index through 12/31/2012; 59% Barclays Capital U.S. Aggregate Index, 23% Barclays Capital U.S. High Yield Bond Index, 18% JP Morgan GBI-EM Global Diversified through 3/31/2015; 73% Barclays Capital U.S. Aggregate Index, 27% Barclays Capital U.S. High Yield Bond Index thereafter.

Executive Summary

Public Markets Fixed Income

For the one-year period ended 3/31/16, the Public Markets Fixed Income portfolio generated a 1.8% return, which exceeded its benchmark by 1.3%.

The outperformance over the one-year period was primarily due to a tactical underweight to High Yield Fixed Income, an asset class which performed poorly with a market return of -3.7%; outperformance by high yield managers (particularly Columbia) relative to the high yield bond benchmark; outperformance by passive Core Fixed Income managers particularly the internally managed F2 portfolio; and a tactical allocation made to the Treasuries (Long Duration) asset class in August 2015 which performed well with an inception-to-date return of 8.3%.

Over the past one-, three-, five- and ten-year periods, the ASRS Public Markets Fixed Income portfolio experienced returns of 1.8%, 1.6%, 3.6% and 5.0%, respectively. The portfolio produced returns in excess of its benchmark in each of these periods. Returns in the most recent one- and three-year periods are lower in comparison to prior periods due to the low level of interest rates and an increase in credit spreads, which adversely affected returns of credit investments.

Executive Summary (continued)

Private Debt and Opportunistic Debt

Private Debt and Opportunistic Debt are two important asset classes that are not included in the ASRS Custom Public Markets Fixed Income Benchmark.

Private Debt generated a return for the one-year period ended 12/31/15 of 8.5%, which exceeded the return of its benchmark by 7.4%. The inception-to-date IRR for this asset class was 10.9%, which exceeded the return of the benchmark by 7.6%.

Opportunistic Debt experienced weak performance with a return for the one year period ended 12/31/15 of -3.1%. This compares with an expected return of 8.0% over the long-run. The disappointing performance was due to across-the-board weakness in credit markets particularly distressed debt, which represents the vast majority of the Opportunistic Debt portfolio. The inception-to-date IRR for the Opportunistic Debt asset class was 9.3%.

(Note: returns for Private Debt and Opportunistic Debt are reported with a one quarter lag.)

Executive Summary (continued)

- As a May 31, 2016, ASRS was positioned in fixed income as follows based on the SAAP adopted in 2015 and the Interim Adjusted SAAP Policy targets:

	<u>Actual</u>	<u>SAAP Target</u>	Interim Adjust. SAAP	Over/ <u>(Under)</u> ¹
Total Fixed Income	26.3%	25.0%	25.1%	1.2%
Treasuries (Long Duration)	1.1%	0.0%		
Core Fixed Income	<u>10.8%</u>	<u>11.0%</u>		
Interest Rate Sensitive	11.9%	11.0%	12.6%	(0.6%)
High Yield	3.2%	4.0%	4.6%	(1.4%)
Private Debt	7.9%	10.0%	7.9%	0.0%
Opportunistic Debt	3.2%	0.0%	0.0%	3.2%

¹ Versus Interim SAA adjusted policy with unfunded private debt and real estate prorated to Interest Rate Sensitive and High Yield.

Executive Summary (continued)

- **As of May 31, 2016, yields and durations in select sectors of the U.S. public fixed income markets were as follows:**

	<u>Yield</u>	<u>Duration</u>
Core Fixed Income (Barclays US Aggregate Index)	2.2%	5.5
US Treasuries	1.4%	6.2
US Treasuries - Long	2.5%	18.0
US Agency Mortgage-Backed Securities	2.4%	3.1
Investment Grade Corporates	3.1%	7.3
High Yield (Below Investment Grade Corporates)	7.3%	4.2

Executive Summary (continued)

- **IMD believes that compelling opportunities to achieve the fund's 8% target return over the long-term exist in two areas of fixed income: private and opportunistic debt.**

	Expected Net Return
Private Debt Mandates Drawing Capital	6-13%
Opportunistic Debt Mandates Drawing Capital	8-12%

- **The ability to allocate capital to private and opportunistic debt is constrained by our managers' ability to source attractive investments. In addition, the investments are typically illiquid.**

Interest Rate Sensitive Fixed Income

Interest Rate Sensitive Fixed Income

Interest Rate Sensitive Fixed Income is comprised of the Core Fixed Income and Treasuries (Long Duration) asset classes. Core fixed income represents the US investment-grade market which includes US Treasuries and Agencies, Agency Mortgage-Backed Securities, Corporate Bonds, Commercial Mortgage-Backed Securities (CMBS) and Asset-Backed Securities (ABS). Its benchmark is the Barclays U.S. Aggregate Bond Index, which encompasses the market for U.S. dollar denominated, fixed-rate, taxable, investment-grade bonds that are SEC-registered. Treasuries (Long Duration) is comprised of US Treasuries with maturities of 10 years or longer; its benchmark is the Barclays U.S. Treasury Long Index.

The performance of Interest Rate Sensitive Fixed Income is heavily tied to the direction of US Treasury rates. In addition, Interest Rate Sensitive Fixed Income tends to perform well when equity markets decline (ex. 2008) or when inflation expectations materially decline. As a result, it is an important part of the overall ASRS portfolio because it provides a source of balance and diversification from riskier assets such as equities.

IMD House View:

Interest Rate Sensitive Fixed Income is likely to generate low returns due to low overall yields as Treasury rates remain at low levels. That being said, it remains a safe haven in times of market turbulence and tends to perform well when risky assets such as equities sell off. We are underweight Interest Rate Sensitive Fixed Income vs. the interim SAA adjusted policy target. However, when factoring in our allocation to the Treasuries (Long Duration) asset class, we are effectively equal weight to the target based on the portfolio's sensitivity to interest rate movements.

Actual Weighting vs. SAAP Policy:	Underweight
ASRS Actual Weighting (May 31, 2016)	11.9%
Interest Rate Sensitive Interim Adj. Policy	12.6%
Interest Rate Sensitive Policy	11.0%

Core Fixed Income Managers

Portfolio	Market Value (\$MM) 5/31/16	%	IMD Commentary
F2 Internally Managed Account	\$1,879	54	Enhanced passive strategy with an objective to slightly outperform the Barclays U.S. Aggregate Bond Index (the "Index") through a stratified sampling strategy. History of outperformance particularly over the past 10-year period.
Blackrock US Debt Index Fund	\$1,599	46	Passive strategy with history of modest outperformance.
Total	\$3,478	100	

Treasuries (Long Duration) Manager

Portfolio	Market Value (\$MM) 5/31/16	%	IMD Commentary
BlackRock Long Term Government Bond Index Fund	\$383	100	Passive strategy.
Total	\$383	100	

Changes to Interest Rate Sensitive Fixed Income Managers

- In August 2015, due to concerns about weakness in the broader financial markets, ASRS tactically made a \$388 million allocation to the Treasuries (Long Duration) asset class through an investment in the passive Blackrock Long Term Government Bond Index Fund.
- In addition, we have occasionally withdrawn cash from both Core Fixed Income and Treasuries (Long Duration) mandates to meet the operating needs of the total fund.

Arizona State Retirement System

Interest Rate Sensitive Fixed Income Performance Summary as of March 31, 2016

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Total Interest Rate Sensitive Fixed Income	3,927,020,606	11.6	3.5	15	4.2	5	2.5	7	2.7	29	4.0	63	5.1	60	8.3	Jul-75
<i>Barclays Aggregate</i>			<u>3.0</u>	30	<u>3.7</u>	8	<u>2.0</u>	19	<u>2.5</u>	39	<u>3.8</u>	79	<u>4.9</u>	83	--	Jul-75
<i>Over/Under</i>			0.5		0.5		0.5		0.2		0.2		0.2			
<i>InvestorForce Public DB > \$1 Billion US Fixed Income Net Median</i>			2.7		1.7		0.7		2.2		4.1		5.4		8.4	Jul-75
Treasuries (Long Duration)																
BlackRock Long Gov't Bond Index	382,039,530	1.1	8.1	1	--	--	--	--	--	--	--	--	--	--	8.3	Sep-15
<i>Barclays U.S. Treasury Long TR USD</i>			<u>8.2</u>	1	<u>12.1</u>	1	<u>2.8</u>	6	<u>6.1</u>	1	<u>9.7</u>	1	<u>8.0</u>	1	<u>8.3</u>	Sep-15
<i>Over/Under</i>			-0.1												0.0	
<i>eA US Core Fixed Inc Net Median</i>			2.9		3.3		1.8		2.5		4.0		5.1		3.0	Sep-15
Core Fixed Income																
BlackRock US Debt Index	1,592,829,593	4.7	3.1	34	3.8	29	2.1	28	--	--	--	--	--	--	3.7	May-14
<i>Barclays Aggregate</i>			<u>3.0</u>	40	<u>3.7</u>	32	<u>2.0</u>	35	<u>2.5</u>	47	<u>3.8</u>	69	<u>4.9</u>	73	<u>3.5</u>	May-14
<i>Over/Under</i>			0.1		0.1		0.1								0.2	
<i>eA US Core Fixed Inc Net Median</i>			2.9		3.3		1.8		2.5		4.0		5.1		3.4	May-14
Internally Managed F2	1,927,206,711	5.7	3.0	49	3.9	24	2.3	18	2.8	23	4.1	46	5.2	47	5.4	Oct-00
<i>Barclays Aggregate</i>			<u>3.0</u>	40	<u>3.7</u>	32	<u>2.0</u>	35	<u>2.5</u>	47	<u>3.8</u>	69	<u>4.9</u>	73	<u>5.3</u>	Oct-00
<i>Over/Under (vs. Net)</i>			0.0		0.2		0.3		0.3		0.3		0.3		0.1	
<i>eA US Core Fixed Inc Net Median</i>			2.9		3.3		1.8		2.5		4.0		5.1		5.5	Oct-00
Passive Intermediate Gov't/Credit Fixed Income																
BlackRock Intermediate Gov't/Credit Bond Index	24,944,772	0.1	2.3	54	2.6	52	2.0	41	1.9	43	3.1	51	--	--	4.5	Nov-08
<i>Barclays Int Gov't/Credit</i>			<u>2.4</u>	28	<u>2.7</u>	41	<u>2.1</u>	35	<u>1.8</u>	50	<u>3.0</u>	56	<u>4.3</u>	52	<u>4.4</u>	Nov-08
<i>Over/Under</i>			-0.1		-0.1		-0.1		0.1		0.1				0.1	
<i>eA US Interm Duration Fixed Inc Net Median</i>			2.3		2.6		1.9		1.8		3.1		4.4		4.8	Nov-08

NOTES:

- BlackRock Intermediate Gov't/Credit Bond Index is System only.

HIGH YIELD FIXED INCOME

High Yield Fixed Income

High Yield Fixed Income is the below investment-grade corporate bond market in the US. Unlike Interest Rate Sensitive Fixed Income which has a high correlation with Treasury rates, High Yield Fixed Income has historically had a negative correlation with Treasury rates and a positive correlation with the equity markets.

Returns are heavily influenced by credit developments at highly leveraged companies whose performance is tied to factors that affect equity markets (economic outlook, earnings, cash flow, valuations, etc.)

IMD House View:

Over the past few years, valuations in the high yield bond market have become more attractive; however, the wider spreads may primarily reflect deteriorating credit quality. Over the coming months, we expect a significant rise in corporate defaults. Initially, this deterioration in credit quality will be led by sectors that have been adversely affected by the severe decline in global commodity prices including energy, energy services, metals and mining. However, as we are likely in the later stages of credit cycle that began with an upturn in 2009, we expect credit ratings to decline and defaults to increase in other sectors as well. We believe this will likely lead to a spike in defaults (probably in 2017) and further spread widening before the market bottoms. An increase in defaults should create attractive opportunities for our distressed debt managers in the Opportunistic Debt asset class. With this view, we are underweight High Yield vs. the SAA interim adjusted policy target.

Actual Weighting vs. SAAP Policy:

ASRS Actual Weighting (May 31, 2016)
High Yield Fixed Income Interim Adj. Policy
High Yield Fixed Income Policy

Underweight

3.2%
4.6%
4.0%

High Yield Fixed Income Managers

Portfolio	Market Value (\$MM) 5/31/16	%	IMD Commentary
Columbia Separate Account	\$709	66	Active manager with flexible investment style that adjusts portfolio risk based on the investment outlook. Columbia has outperformed the high yield benchmark for the one-year, three-year, and five-year periods as well as since the inception of the mandate in 2009.
JP Morgan High Yield	\$362	34	Active manager with a flexible investment style that is agnostic to credit quality. Since the inception of the mandate in 2013, JP Morgan has slightly outperformed the high yield benchmark.
Total	\$1,071	100	

Changes to High Yield Fixed Income Managers

- In August 2015, due to concerns about the credit markets, ASRS tactically withdrew \$250 million from High Yield Fixed Income (\$125 million from each manager).

Arizona State Retirement System

High Yield Fixed Income Performance Summary as of March 31, 2016

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Total High Yield Fixed Income	1,038,157,952	3.1	3.0	19	-1.1	24	-1.1	24	3.1	16	5.5	15	--	--	7.6	Oct-09
<i>Barclays High Yield</i>			<u>3.4</u>	12	<u>-3.7</u>	53	<u>-3.7</u>	56	<u>1.8</u>	51	<u>4.9</u>	39	<u>7.0</u>	20	<u>7.7</u>	<i>Oct-09</i>
<i>Over/Under</i>			-0.4		2.6		2.6		1.3		0.6				-0.1	
<i>eA US High Yield Fixed Inc Net Median</i>			2.3		-3.5		-3.2		1.9		4.6		6.3		7.1	<i>Oct-09</i>
Active High Yield Fixed Income																
<i>Columbia Management</i>	691,147,784	2.1	3.1	19	0.3	10	0.2	9	3.7	3	6.1	5	--	--	8.2	<i>Oct-09</i>
<i>Barclays High Yield</i>			<u>3.4</u>	12	<u>-3.7</u>	53	<u>-3.7</u>	56	<u>1.8</u>	51	<u>4.9</u>	39	<u>7.0</u>	20	<u>7.7</u>	<i>Oct-09</i>
<i>Over/Under</i>			-0.3		4.0		3.9		1.9		1.2				0.5	
<i>eA US High Yield Fixed Inc Net Median</i>			2.3		-3.5		-3.2		1.9		4.6		6.3		7.1	<i>Oct-09</i>
<i>JP Morgan High Yield</i>	346,996,407	1.0	2.8	27	-3.7	53	-3.5	54	--	--	--	--	--	--	2.7	<i>Jul-13</i>
<i>Barclays High Yield</i>			<u>3.4</u>	12	<u>-3.7</u>	53	<u>-3.7</u>	56	<u>1.8</u>	51	<u>4.9</u>	39	<u>7.0</u>	20	<u>2.6</u>	<i>Jul-13</i>
<i>Over/Under</i>			-0.6		0.0		0.2								0.1	
<i>eA US High Yield Fixed Inc Net Median</i>			2.3		-3.5		-3.2		1.9		4.6		6.3		2.5	<i>Jul-13</i>

PRIVATE DEBT

Private Debt

Private Debt is comprised of illiquid loans and bonds that typically fund highly leveraged companies and real estate properties that are typically too small in size to meet the requirements of the tradable leveraged loan, high yield bond, or commercial mortgage-backed securities markets. For example, Private Debt may consist of secured loans funding leveraged buyouts of small to mid-size companies or mezzanine financing for real estate properties.

Returns in the asset class are determined by: 1) the expected returns of individual investments (based on the cash coupon rate or spread over LIBOR and other sources of return including underwriting fees, original issuance discounts and premium call features) and 2) the actual level of credit losses experienced in the underlying portfolios.

IMD House View:

Private Debt offers the most attractive opportunity in the fixed income markets with double-digit yields readily available for investors willing to accept illiquidity. The market opportunity is principally driven by regulatory constraints that make it unattractive for banks to hold illiquid loans or other debt of below investment-grade credit quality.

Actual Weighting vs. SAAP Policy:	Underweight¹
Actual Weighting (May 31, 2016)	7.9%
Private Debt Policy	10.0% (8-12% range)

¹ASRS is tactically overweight based on commitments made of approximately 15.2% of the total fund.

Private Debt Characteristics

Pros

- High Expected Net Returns (10-11% on average)
 - Substantially higher gross returns (a combination of yield, fees, OID, and call premiums) than comparable public market securities (high yield bonds, tradable bank loans, asset-backed securities, CMBS)
 - Low loss history in underlying portfolios
- Primarily Floating Rate
 - Approximately 80% of ASRS's ongoing private debt commitments are expected to be floating rate investments
- Full Due Diligence by Managers
- Customized Covenants and Credit Monitoring

Cons

- Illiquid
- Delayed Deployment of Capital

Private Debt Market Environment

- Demand for corporate loans are driven by: 1) middle market buyout and acquisition activities which need financing, and 2) middle market borrowers which need to refinance existing loans from banks.
- Regulatory constraints limit banks ability to make below investment-grade, illiquid loans (typically to middle market companies)
 - Basel III
 - Dodd-Frank
 - “Leveraged Lending Guidelines” of OCC/Fed/FDIC
- Business Development Companies (“BDCs”) have pulled back on lending due to their depressed equity valuations.

ASRS Private Debt Program

Lending Strategies Diversified Across 10 Managers

- US Corporate
 - Five managers targeting unique areas of the middle market
 - One manager targeting larger companies
- European Corporate
 - One manager targeting middle market lending
- Real Estate Finance
 - Two managers targeting three market segments
- Asset Backed
 - One manager targeting unique market opportunity

ASRS Private Debt Program

- Focus on Fund-of-One Partnerships With Leading Managers
- Customized Terms:
 - Scalable
 - Evergreen
 - Termination Rights
 - Superior Fees
 - Investment Restrictions
 - Leverage Constraints (if applicable)

Private Debt Managers

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/31/16	Target Net Return	%	IMD Commentary
Cerberus ASRS Credit Opportunities Fund	\$1,100	878	13%	33	Fund-of-one partnership that invests in floating-rate secured loans primarily to fund private-equity sponsored middle market leveraged transactions . The partnership can leverage ASRS's equity investment by up to 1.25x to boost returns.
RFM Cactus Holding Company, LLC (Partnership with Related)	\$600	445	10%	17	Fund-of-one partnership that invests in: 1) "Freddie B" securities (first loss tranches of multi-family property securitizations that have been pooled and sponsored by Freddie Mac;) and 2) mezzanine debt to finance real estate properties.
Cactus Direct Lending Fund, LP (Partnership with Highbridge)	\$600	183	12%	7	Fund-of-one partnership that invests in floating-rate secured loans primarily to fund middle market leveraged transactions (ex. buyouts, recapitalizations) often without a private equity sponsor. The partnership can leverage ASRS's equity investment by up to 1.25x to boost returns.
AP Mezzanine Partners III , LP (Partnership with Highbridge)	\$500	0	12%	0	Fund-of-one partnership that invests primarily in mezzanine debt to fund highly leveraged transactions for larger capitalization companies.
ICG Arizona Senior Direct Lending Credit Fund	\$401	74	11%	3	Fund-of-one partnership that invests in floating-rate secured loans primarily to fund private-equity sponsored middle market leveraged transactions in Europe. The partnership can leverage ASRS's equity investment by up to 1.0x.
H/2 Core Real Estate Debt Fund	\$400	282	6%	10	Open-ended fund that invests in floating-rate senior mortgage loans and other conservatively underwritten real estate finance investments. The fund will utilize leverage of up to 60%.
Ares Cactus Private Asset Backed Fund	\$500	67	10%	2	Fund-of-one partnership that invests in loans backed by consumer and commercial receivables.
Monroe Private Credit Fund A	\$450	290	11%	11	Fund-of-one partnership that invests in floating-rate secured loans primarily to fund smaller middle market leveraged transactions . The partnership can leverage ASRS's equity investment by up to 1.25x to boost returns.
AP Mezzanine Partners II, LP (Partnership with Highbridge)	\$229	185	11%	8	Fund-of-one partnership that invests primarily in mezzanine debt to fund highly leveraged transactions for larger capitalization companies. Investment period expires 6/30/16.
Arizona – White Oak Investor LLC	\$210	171	12%	7	Separate account invests in floating-rate secured loans for small-to mid-size companies typically lacking a deal sponsor.
Blackstone/GSO Capital Solutions Fund (closed end fund in liquidation)	\$66	66	13%	2	Commingled fund which provided rescue financing to companies seeking to avoid a bankruptcy or restructuring. Investment period ended in 2013 and portfolio is now running off.
Total	\$5,056	\$2,641		100	27

Changes to Private Debt Managers

- Over the past twelve months, ASRS increased the size of its Private Debt commitments by \$1 billion. Total commitments for Private Debt are now \$5.1 billion or approximately 15.2% of the total fund (vs. an SAAP target of 10%).
 - We believe it may take 2 to 3 years to fully invest these commitments.
 - We estimate that ASRS will reach its 10% SAAP target for the Private Debt asset class in the first half of 2017.
- The expansion of our commitments included a new \$500 million commitment to AP Mezzanine Partners III, a fund-of-one partnership with Highbridge to invest in the mezzanine debt of larger companies.
- In addition, ASRS expanded our commitments to the following existing private debt mandates:
 - Cerberus ASRS Credit Opportunities Fund to \$1.1 billion from \$1 billion
 - RFM Cactus Holding Company, LLC to \$600 million from \$500 million.
 - HPS – Cactus Direct Lending Fund to \$600 million from \$500 million.
 - Monroe Private Credit Fund A to \$450 million from \$350 million.
 - H/2 Core Real Estate Debt Fund \$400 million from \$350 million.
 - Arizona – White Oak Investor, LLC to \$210 million from \$160 million.

Private Debt Performance Summary as of December 31, 2015

	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Inception (%)	Since
Total Private Debt	2,381,652,235	7.1	1.9	8.5	10.7		10.9	Jul-12
<i>S&P/LSTA Leveraged Loan Index + 250 bps 1 QTR Lagged</i>			<i>-1.5</i>	<i>1.1</i>	<i>3.1</i>		<i>3.3</i>	<i>Jul-12</i>
Over/Under			3.4	7.4	7.6		7.6	
Total Corporate Private Debt	1,643,861,421	4.9	2.1	9.4	12.7		12.8	
Blackstone/GSO Capital Solutions Fund, LP	80,676,065	0.2	-6.6	-5.9	11.1		12.0	Jul-12
Cerberus ASRS Credit Opportunities Fund, LP	745,833,029	2.2	2.7	12.1			13.1	Jan-13
AP Mezzanine Partners II, LP	195,753,488	0.6	2.4	10.1			12.7	Jan-13
Cactus Direct lending Fund, L.P.	94,623,957	0.3	3.8				5.1	Jul-15
ICG Arizona Senior Direct Lending Credit Fund	169,139,745	0.5	1.8				2.4	Jul-15
Monroe Private Credit Fund A	194,772,983	0.6	3.2				5.6	Jul-15
Arizona White Oak Investor LLC	163,062,154	0.5	2.4	10.3			15.4	Jan-13
Total Real Estate Private Debt	695,378,992	2.1	1.4	6.7			6.5	
H/2 Core Real Estate Debt Fund, LP	289,226,751	0.9	2.3	5.7			5.5	Jan-13
RFM Cactus Holding Company, LLC	406,152,241	1.2	0.7	7.8			7.7	Apr-13
Total Asset Backed Private Debt	42,411,823	0.1	6.1				11.5	
Ares Cactus Private Asset Backed Fund	42,411,823	0.1	6.1				11.5	Jul-15

Source: State Street

OPPORTUNISTIC DEBT

Opportunistic Debt

Opportunistic Debt is tactical in nature and represents asset classes or strategies not encompassed in the SAAP and offer the potential to meet the fund's targeted return. Since its inclusion in ASRS's portfolio beginning in 2008, Opportunistic Debt, including both existing and defunded mandates, has generated an aggregate net IRR of 9.3% through 12/31/15. However, performance over the past three years was not as strong with a 4.2% net IRR primarily due to weak performance in 2015.

IMD House View:

Opportunities exist in select fixed income markets (primarily distressed debt) to achieve outsized returns or generate expected returns that exceed other fixed income asset classes in the SAAP. ASRS has \$1.3 billion of commitments (representing approximately 3.9% of the total fund) to ongoing Opportunistic Debt partnerships and \$0.3 billion of investments (representing approximately 0.9% of the total fund) in partnerships that are in liquidation.

Actual Weighting vs. SAAP Policy Target:

ASRS Actual Weighting (May 31, 2016)	3.2%
Opportunistic Debt Policy	0.0% (0-10% ¹ range)

¹ Range of 0-10% includes all opportunistic asset classes (debt, equity and inflation-linked) which totaled 4.2% at 5/31/16.

Opportunistic Debt Managers Funds Making New Investments

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/31/16	Target Net Return	%	IMD Commentary
GSO Cactus Credit Opportunities Fund	\$350	\$308	12%	40	Partnership with ASRS to exploit the highest conviction, risk-adjusted corporate credit opportunities across the GSO platform including distressed debt in the US and Europe.
Avenue-ASRS Europe Opportunities Fund & Avenue Europe Capital Partners III	\$350	\$158	12%	21	\$250 million partnership with ASRS and \$100 million co-mingled fund commitment to invest in distressed debt of European companies.
OZ Credit Opportunities Fund	\$300	\$304	12%	39	Fund utilizes a multi-strategy approach to allocate to both distressed structured and corporate credit as it sees fit based on the opportunity.
Ares Saguaro Income Opportunity Fund	\$300	\$0	8%	0	Fund invests in publicly-traded, high-yielding business development companies (“BDCs”) and commercial mortgage REIT
Total	\$1,300	\$770		100	

Opportunistic Debt Managers Funds in Liquidation

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/31/16	Target Net Return	%	IMD Commentary
Avenue Europe Capital Partners II	\$133	\$133	15%	43	Fund invests in distressed debt of European companies. Investment period ended in 2014.
Oaktree Opportunities Fund VIIIb	\$112	\$112	15%	36	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2014.
Fortress MSR Opportunities Fund II	\$30	\$30	12%	10	Fund invests in excess mortgage-servicing rights. Investment period ended in 2015.
Oaktree Opportunities Fund VIII	\$19	\$19	15%	6	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2012.
TCW Capital Trust	\$13	\$13	10%	5	Fund invests in four asset classes: leveraged loans, high yield bonds, private debt and mezzanine debt. Investment period ended in 2013.
Total	\$307	\$307		100	

Changes to Opportunistic Debt Managers

- In May, ASRS partnered with Ares to create a unique mandate, the Ares Saguaro Income Opportunity Fund, to invest in publicly-traded, high-yielding business development companies (“BDCs”) and commercial mortgage REITS. ASRS made a \$300 million commitment to this fund with an initial investment of \$75 million funded in early June.
- The investment period of the Fortress MSR Opportunities Fund II ended and the fund is returning capital.

Opportunistic Debt Performance Summary as of December 31, 2015

	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Inception (%)	Since
Total Opportunistic Debt	1,117,282,802	3.3	-3.7	-3.1	4.2	5.5	9.3	Jan-08
Avenue Europe Special Situations Fund II (U.S.), L.P.	180,249,671	0.5	0.1	10.6	8.5		8.9	Jan-12
Avenue Europe Special Situations Fund III (US), L.P.	52,598,162	0.2	-3.5				-7.6	Jul-15
Avenue-ASRS Europe Opportunities Fund, L.P.	69,885,811	0.2	-5.3				-9.9	Jul-15
Blackrock Credit Investors II, L.P.	158,480	0.0	-5.1	-5.5	12.8	2.7	15.7	Jul-08
Blackrock Mortgage Investors, LP	6,224	0.0	0.0	0.0	6.0	10.6	8.2	Jan-08
Fortress MSR Opportunities Fund II A LP	32,564,516	0.1	-1.6	6.5			10.9	Jul-13
GSO Cactus Credit Opportunities Fund LP	311,139,146	0.9	-6.3	-6.0			-2.5	Apr-14
Oaktree Opportunities Fund VIII, L.P.	23,951,338	0.1	-3.6	-13.3	6.6	7.7	8.4	Apr-10
Oaktree Opportunities Fund VIIIb, L.P.	127,019,846	0.4	-4.0	-6.7	3.5		4.4	Jul-11
OZ Credit Opportunities Domestic Partners, L.P.	302,875,643	0.9	-3.2	-5.4			0.5	Jan-14
TCW Capital Trust	16,833,964	0.0	-1.9	4.9	6.8	7.0	8.3	Oct-09

Source: State Street

Opportunistic Debt Manager Performance in 2015

- In 2015, the Opportunistic Debt portfolio returned -3.1% vs. a long-term target of 8.0%. The negative performance was primarily caused by substantial spread widening in the broader credit markets (both corporate and structured credit) as well as weakness in specific industries (ex. oil and gas, coal, shipping) that adversely affected distressed debt.
- Overall, the Opportunistic Debt portfolio performed relatively well versus the HFRX ED: Distressed Restructuring Index, which tracks a peer group of distressed debt funds as compiled by Hedge Fund Research. This index returned -11.1% in 2015.
- In addition, the Opportunistic Debt portfolio performed relatively well versus other high yield and distressed debt indices in 2015:

– Barclays U.S. High Yield Index	-4.4%
– Credit Suisse CCC index	-15.5%
– Altman Defaulted Public Bond and Bank Loan Index	-31.0%
– CS Distressed Securities Index	-43.5%

APPENDICES

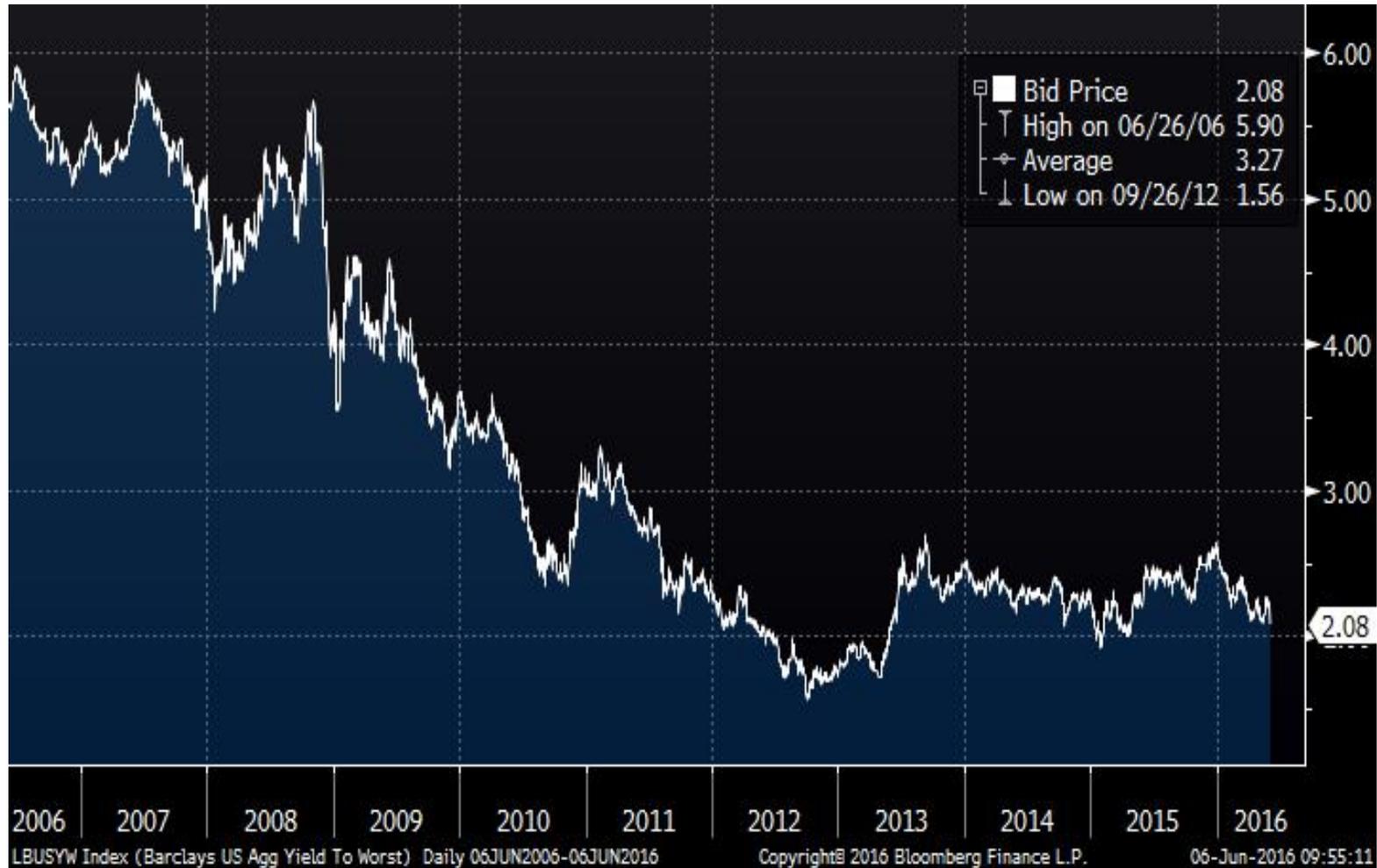
1. Fixed Income Market Environment (For Reference Only)
2. ASRS Strategic Asset Allocation Policy Schematic

APPENDIX 1

FIXED INCOME MARKET ENVIRONMENT (FOR REFERENCE ONLY)

Interest Rate Sensitive Fixed Income

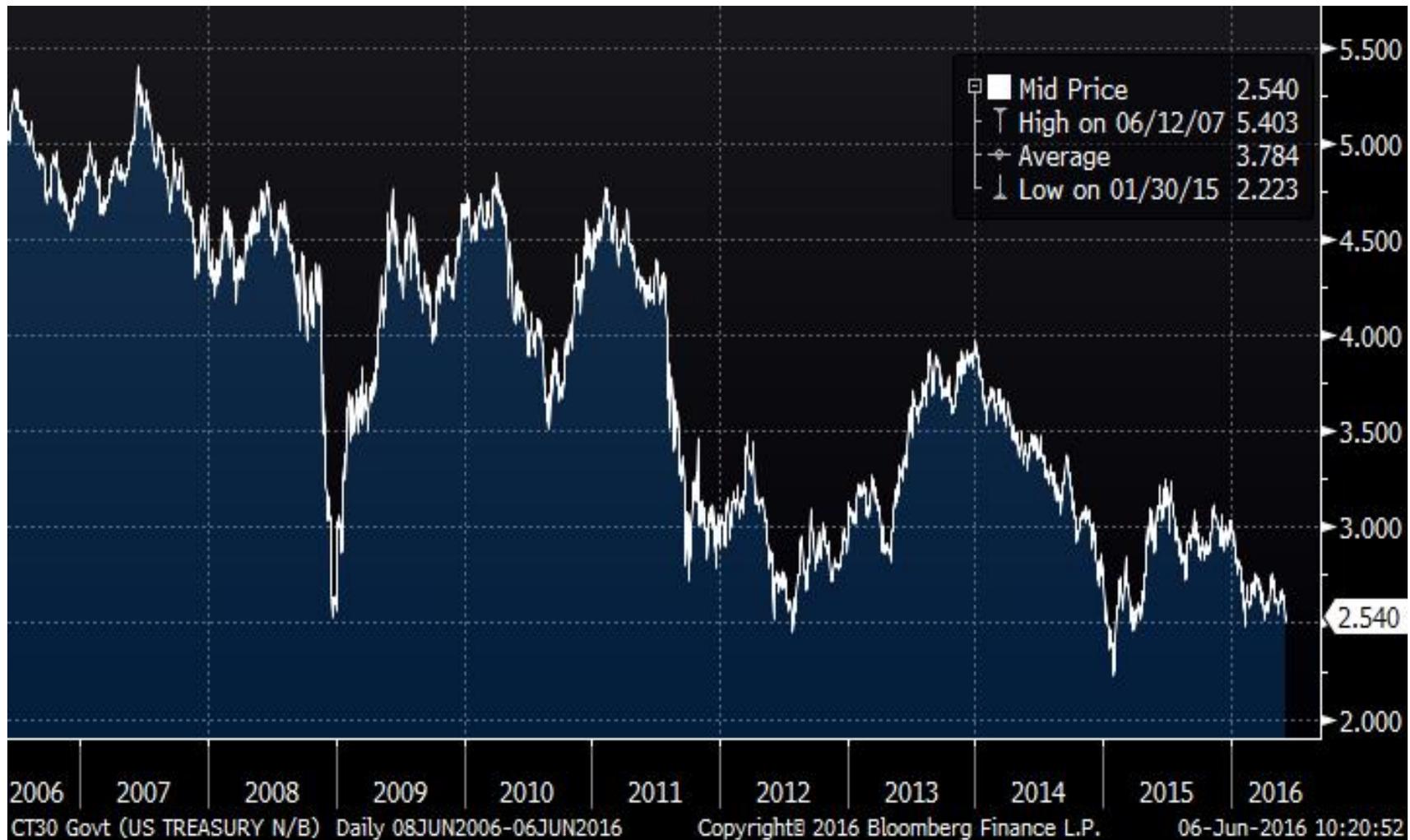
Barclays US Aggregate Index Yield-to-Worst 2006 – 2016



10 Year U.S. Treasury Bond Yield 2006 - 2016

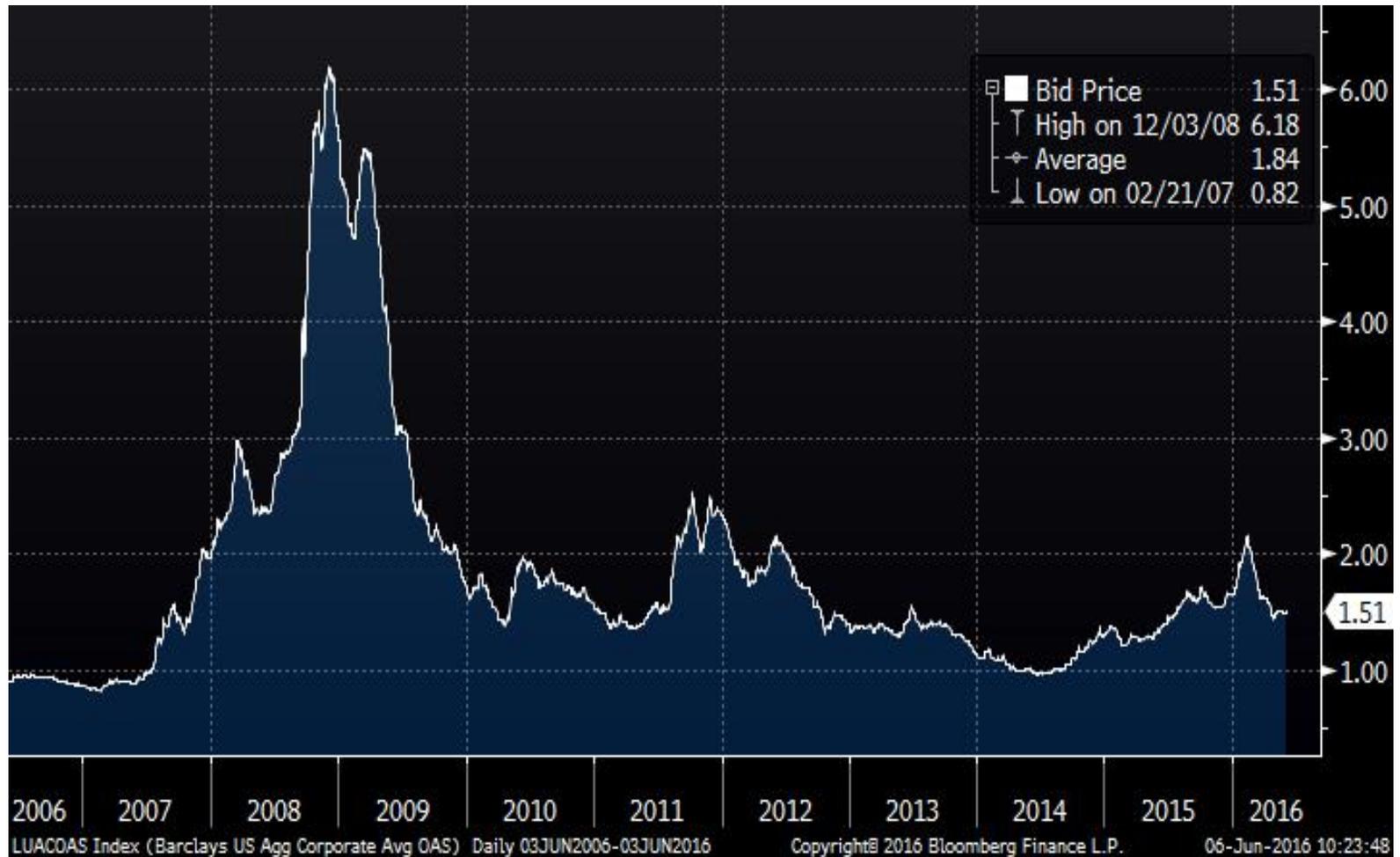


30 Year U.S. Treasury Bond Yield 2006 – 2016



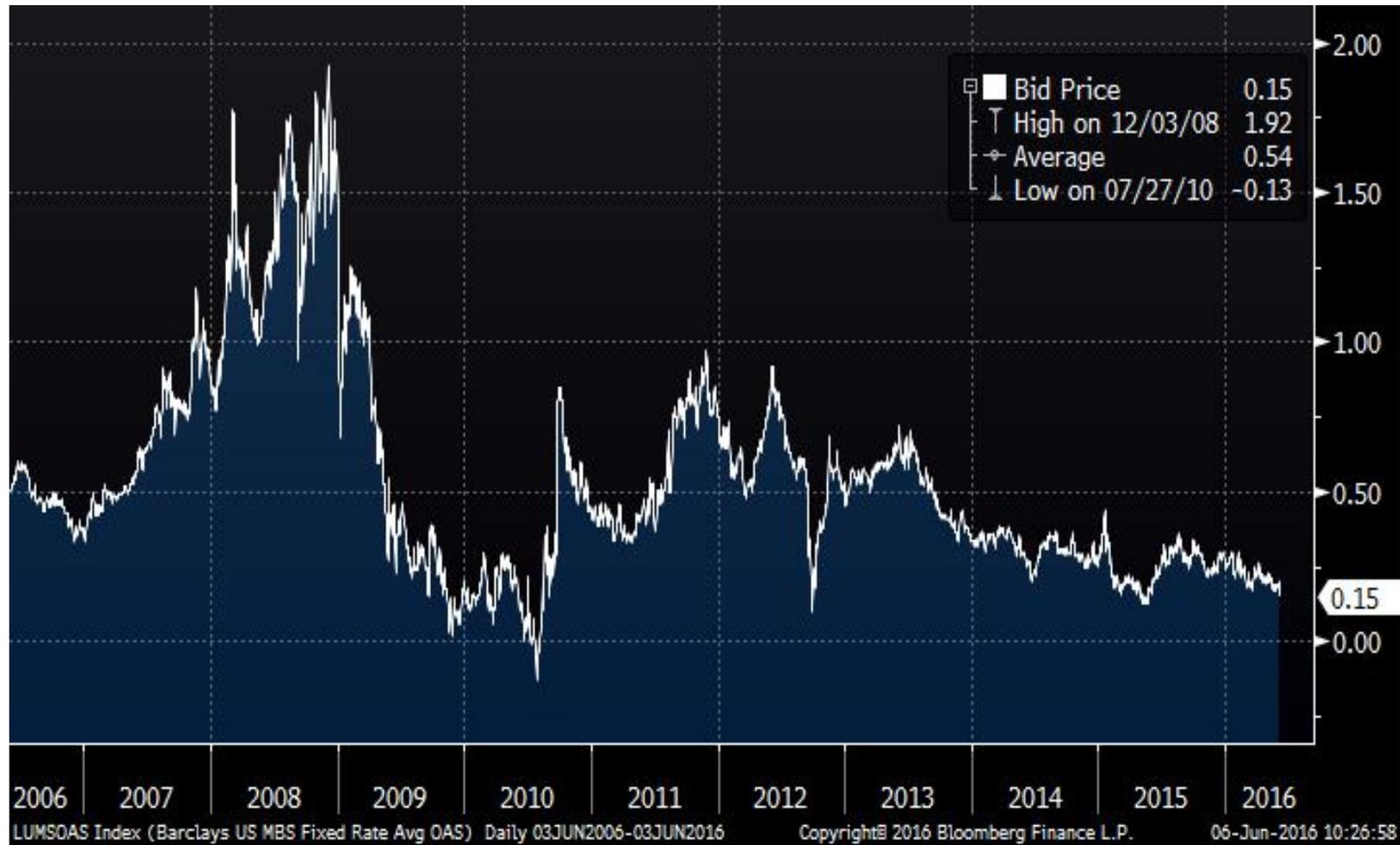
Corporate Investment Grade Spreads

Option Adjusted Spreads (OAS) 2006 – 2016



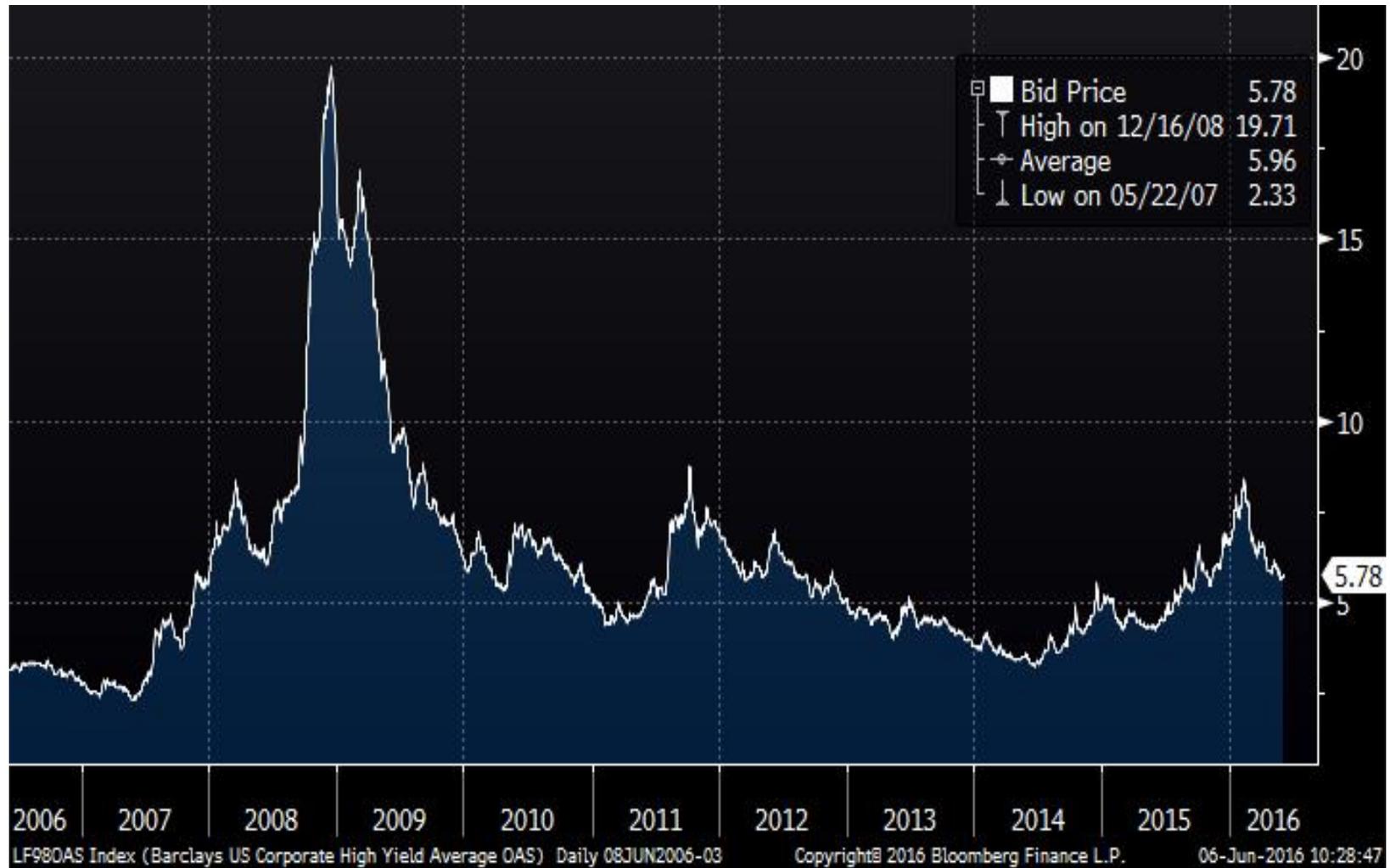
US Mortgage-Backed Securities Spreads

Option Adjusted Spreads (OAS) 2006 – 2016

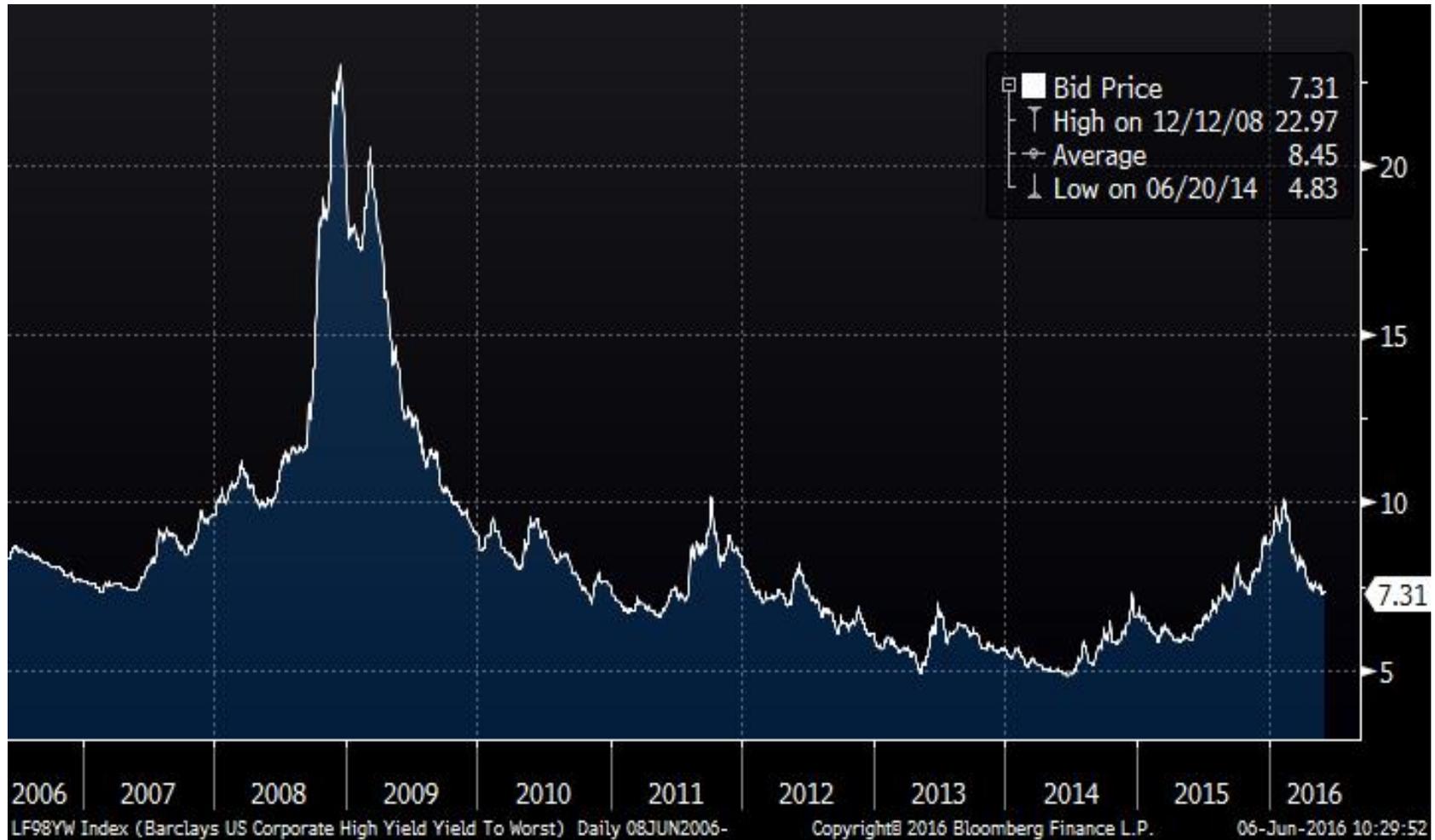


High Yield Fixed Income

Barclays US Corporate High Yield Index Option Adjusted Spread (OAS) 2006 – 2016



Barclays US Corporate High Yield Index Yield-to-Worst 2006 – 2016



Sovereign Bond Yields

10 Year German Bund Yield 2006 - 2016



10 Year Japanese Government Bond Yield 2006 - 2016



Emerging Market Local Debt Index 2006 - 2016



APPENDIX 2

ASRS STRATEGIC ASSET ALLOCATION POLICY SCHEMATIC

ASRS Strategic Asset Allocation Policy Schematic

Asset Class	Policy	Range	Benchmark
Tactical Cash (Unassetized)	0%	(0-3%)	
Operating Cash (Unassetized)	0%		
Operating Cash (Assetized)	<u>0%</u>		
Total Cash	0%		
<hr/>			
Treasuries (Long Duration)	0%	(0-10%)	Barclays LT Treasuries
Core Bonds	<u>11%</u>		Barclays Aggregate
Interest Rate Sensitive	11%		
High Yield	4%		Barclays High Yield
Private Debt	10%	(8-12%)	S&P/LSTA Leveraged Loan Index+2.5%
Opportunistic Debt	0%		Investment Specific
Total Fixed Income	25%	(18-35%)	
<hr/>			
Large Cap	20%		S&P 500
Mid Cap	3%		S&P 400
Small Cap	<u>3%</u>		S&P 600
US Public Equity	26%	(16-36%)	
Developed Large Cap	17%		MSCI EAFE
Developed Small Cap	2%		MSCI EAFE Small Cap
Emerging	<u>5%</u>		MSCI EM
Non-US Public Equity	24%	(14-34%)	
Private Equity	8%	(6-10%)	Russell 2000
Opportunistic Equity	0%		Investment Specific
Total Equity	58%	(48-65%)	
<hr/>			
Commodities	2%	(0-4%)	Bloomberg Total Return
Real Estate	10%	(8-12%)	NCREIF ODCE
Infrastructure	0%	(0-3%)	Investment Specific
Farmland and Timber	0%	(0-3%)	Investment Specific
Opportunistic Inflation Linked	0%		Investment Specific
Total Inflation Linked Assets	12%	(10-16%)	
<hr/>			
Multi-Asset Class Strategies	5%	(0-12%)	Investment Specific
<hr/>			
TOTAL	100%		



Arizona State Retirement System

Investment Beliefs

FRAME OF REFERENCE

The following *Investment Beliefs* have been established to ensure the development of congruent and synergistic investment strategies, and to ensure the effective and efficient allocation of resources. These *Investment Beliefs* determine the general paradigm within which investment strategies are developed, investment ideas are reviewed, and investment decisions are implemented.

Modifications to these *Investment Beliefs* will occur if experiential, academic, conceptual, and/or practical perspectives suggest that a superior belief system exists.

INVESTMENT BELIEFS

1. Asset Class Decisions are Key

In general, decisions with respect to which asset classes and sub-asset classes to invest in, and the allocations to these asset classes and sub-asset classes, have a greater impact on total fund investment returns than decisions in which specific securities to invest.

2. Theories and Concepts Must be Sound

Over longer periods of time, investment outcomes (e.g. rates of return, volatility) conform to logical theories and concepts. Significant deviations (e.g. internet bubble, pre-subprime erosion of risk premiums) from theoretically and conceptually sound investment constructs are usually not sustainable and are typically self-reverting.

3. House Capital Market Views Are Imperative

The development and articulation of sound *House Views* (e.g. views on interest rates, corporate spreads, asset valuations) will ensure consistency among investment decisions, clarity of investment direction, baselines for debates, and conformity of understanding.

4. Investment Strategies Must be Forward Looking

Investment strategies will be developed based on forward-looking insights, rather than simply on successful strategies of the past.

Asset class valuations and security valuations are significantly affected by endogenous outcomes (e.g. earnings, GDP growth rates, competitive barriers) that are probabilistic, and these outcomes are typically well analyzed by the investment industry.

Asset class valuations and security valuations are also significantly affected by random outcomes (e.g. natural disasters, certain supply & demand shocks) that are virtually unpredictable, and these outcomes are typically not analyzed directly by the investment industry.

Asset class valuations and security valuations are also significantly affected by exogenous outcomes (e.g. foreign policies, global cultural interactions) that can possibly be modeled, and these outcomes are typically not analyzed by the investment industry.

5. Public Markets are Generally Informationally Efficient

Asset Class Valuations

Asset class valuations (e.g. stock market levels versus interest rate levels) are often in equilibrium with one another, but anomalous situations do occur which result in disequilibria between asset class valuations. These disequilibria offer valuable investment opportunities which we will pro-actively seek and capitalize on.

Security Valuations

Security valuations (e.g. IBM versus Cisco) are often in equilibrium with one another, but private markets and anomalous public market situations do occur which result in disequilibria between security valuations. These disequilibria offer valuable investment opportunities which we will pro-actively seek and capitalize on.

The extent of informational efficiency varies across asset classes.

Private markets offer significant opportunities for asset mispricing and manager excellence which we will pro-actively seek and capitalize on.

6. Market Frictions are Highly Relevant

Market frictions (e.g. management fees, carried interest, revenue sharing, expenses, costs, transaction spreads, market impacts, taxes, commissions) can be significantly detrimental to investment performance and as a result transactions will be initiated only to the extent there is a strong level of conviction that they will result in increased investment returns or decreased risks net of all market frictions.

7. Internal Investment Professionals are the Foundation of a Successful Investment Program

In-house investment management capability engaged in direct portfolio management results in superior investment decision-making.

In-house investment management pro-actively monitors capital markets in order to determine mispricing opportunities & allocate capital and will successfully increase risk adjusted returns.

In-house investment professionals are more closely aligned with, and have a better understanding of, the purpose and risk & reward tolerance of the ASRS than external parties.

In-house investment professionals will impact direct investment negotiations, better align economic interests, and influence investment industry conditions (e.g. private deal structures, fee levels, introduction of innovative products & strategies).

8. External Investment Management is Beneficial

External investment organizations can often offer greater expertise, resources, and/or flexibility than internal personnel for various investment strategies.

9. Investment Consultants

Investment consultants will be effectively utilized in the following four general categories, and utilization of consultants will be focused on situations where there is a demonstrable need in at least one of the four areas:

- Independence: When oversight or controls should be enhanced
- Perspective: When internal perspectives are not broad enough
- Special Skills: When internal skills are not deep enough
- Resource Allocation: When internal resources are not broad enough

10. Trustee Expertise

Trustees often have expertise in various areas of investment management, and this expertise should be utilized while ensuring separation between Board oversight and staff management.