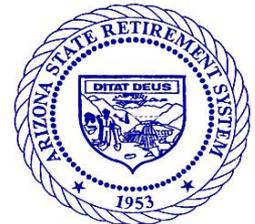


Arizona State Retirement System Investment Committee

Fixed Income Asset Class Review

June 22, 2015



EXECUTIVE SUMMARY

Fixed Income Asset Class Overview

- **Market Value as of May 29, 2015:**
 - **\$7.8 B**
- **Passive Allocation: 49%**

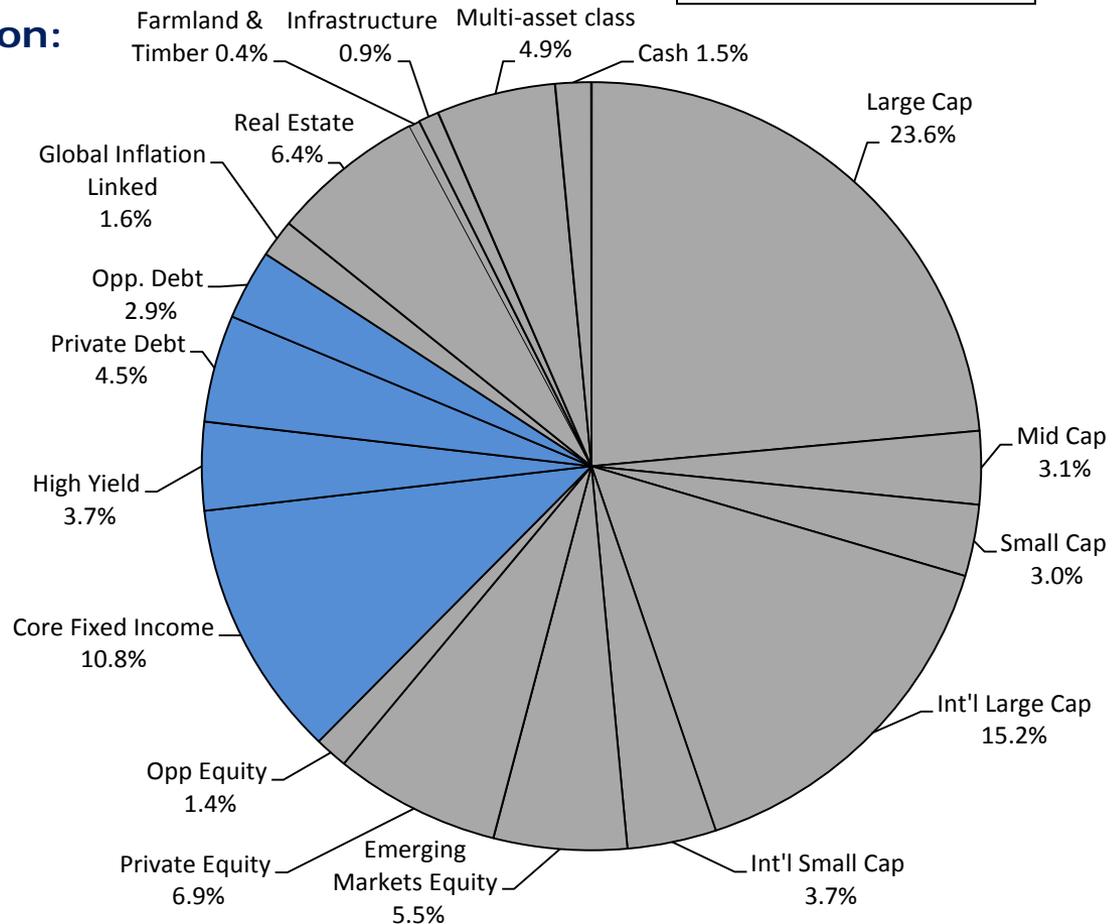
Total Fund: \$35.4 B
U.S. Fixed Income SAAP
Policy: 25%
Range: 18-35%
Actual: 22%

- **Fixed Income Style Composition:**

- Core: 49%
- HY: 17%
- Private Debt: 21%
- Opp Debt: 13%

- **Portfolios:**

- 3 Passive
 - Core: 3
- 16 Active
 - HY: 2
 - Private Debt: 7
 - Opportunistic Debt: 8



Executive Summary

Over the past one-, three-, five- and ten-year periods, the ASRS public markets fixed income portfolio experienced annualized returns ranging from 3-5%. The portfolio produced returns in excess of its benchmark in each of these periods.

For the one-year period ended 3/31/15, the public markets fixed income portfolio generated a 3.5% return, which exceeded its benchmark by 1.8%. The outperformance was primarily due to a tactical underweight in emerging market local currency debt, an asset class which performed poorly with a -11% return; outperformance by high yield managers (particularly Columbia) relative to the high yield bond benchmark; and outperformance by the passive core fixed income managers including the internally managed F2 portfolio.

Private debt and opportunistic debt, which are not included in the ASRS Custom Public Markets Fixed Income Benchmark, performed well and generated returns for the one year period ended 12/31/14 of 10.8% and 7.6%, respectively. (Returns for private debt and opportunistic debt are reported with a one quarter lag.) Inception-to-date IRRs for both of these asset classes have also been strong at 13.1% and 11.5%, respectively. In addition, private debt substantially outperformed its benchmark.

Arizona State Retirement System

Total Fixed Income Performance Summary as of March 31, 2015

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Public Markets Fixed Income	3,902,526,857	11.2	1.8	1.0	3.5	2.9	4.5	5.1	8.4	Jul-75
ASRS Custom Public Markets Fixed Income Benchmark ¹			<u>0.8</u>	<u>-0.8</u>	<u>1.7</u>	<u>2.3</u>	<u>4.0</u>	<u>4.7</u>	--	Jul-75
Over/Under			1.0	1.8	1.8	0.6	0.5	0.4		
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Inception	IRR		Since
Total Private Debt	1,500,947,146	4.3	2.1	10.8			14.7	13.1		Jul-12
S&P/LSTA Leveraged Loan Index +250bps 1QTR Lagged			<u>0.1</u>	<u>4.1</u>			<u>7.3</u>	<u>5.5</u>		Jul-12
Over/Under			2.0	6.7			7.3	7.6		
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	Inception	IRR		Since
Total Opportunistic Debt	1,080,618,285	3.1	-0.8	7.6	10.4	0.0	8.6	11.5		Jan-08

¹ **ASRS Custom Public Markets Fixed Income Benchmark** was Barclays Capital U.S. Aggregate Index through 12/31/2010; 93% Barclays Capital U.S. Aggregate Index, 7% Barclays Capital U.S. High Yield Bond Index through 12/31/2012; 59% Barclays Capital U.S. Aggregate Index, 23% Barclays Capital U.S. High Yield Bond Index, 18% JP Morgan GBI-EM Global Diversified thereafter.

Executive Summary (continued)

- **The adoption of the 2015 SAAP resulted in the following changes to ASRS's fixed income allocation:**
 - The policy weight for Private Debt was increased to 10% from 3%.
 - Emerging Market Debt, which previously had a 4% policy weight, was dropped as an asset class.
 - A new Interest Rate Sensitive asset class was created which includes Core Fixed Income and a new asset category, Treasuries (Long Duration). The policy weight for Interest Rate Sensitive asset class was lowered to 11% from 13%.
 - The policy weight for High Yield was lowered to 4% from 5%.
- **IMD staff has done the following to implement the 2015 SAAP:**
 - Expanded our commitments to private debt partnerships by an incremental \$2.2 billion to nearly \$4.0 billion (which represents slightly over 11% of the total fund). The expanded commitments include the upsizing of two existing partnerships and the creation of four new partnerships. We believe it may take up to 3 years to fully invest these commitments.
 - Defunded both of our Emerging Market Debt mandates.

Executive Summary (continued)

- As a May 29, 2015, 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. <u>SAAP</u>	Over/ <u>(Under)</u> ¹
Total Fixed Income	22.0%	25.0%	26.1%	(4.1%)
Treasuries Long Duration	0.0%	0.0%		
Core Fixed Income	<u>10.8%</u>	<u>11.0%</u>		
Interest Rate Sensitive	10.8%	11.0%	16.1%	(5.1%)
High Yield	3.7%	4.0%	5.5%	(1.8%)
Private Debt	4.5%	10.0%	4.5%	0.0%
Opportunistic Debt	2.9%	0.0%	0.0%	2.9%

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

Executive Summary (continued)

- **ASRS is tactically underweight fixed income. Moreover, ASRS is tactically underweight the *public* fixed income markets as we do not see compelling opportunities to achieve the fund's overall 8% target return as yields are relatively low.**
- **As of May 29, 2015, 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%	5.7
US Treasuries 20+ Year	2.8%	18.5
US Agency Mortgage-Backed Securities	2.5%	4.0
Investment Grade Corporates	3.1%	7.3
High Yield (Below Investment Grade Corporates)	5.9%	4.2

Executive Summary (continued)

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

	Expected Net Return
Private Debt Mandates Drawing Capital	10-11%
Opportunistic Debt Mandates Drawing Capital	10-12%

- **IMD believes that investment opportunities in private and opportunistic debt are relatively insensitive to rising interest rates.**
- **The ability to allocate capital to private and opportunistic debt is constrained by the respective managers' ability to source attractive investments. In addition, the investments are typically illiquid.**

CORE FIXED INCOME

Interest Rate Sensitive/Core Fixed Income

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.

The performance of core fixed income is heavily tied to the direction of US Treasury rates. In addition, core fixed income tends to perform well when equity markets decline (ex. 2008). As a result, it is an important part of the overall ASRS portfolio because it provides a source of balance and diversification.

IMD House View:

The core fixed income market is relatively unattractive due to relatively low overall yields as Treasury rates remain at relatively low levels, and credit and agency MBS spreads are generally tight. The market is vulnerable to rising interest rates should the US economy demonstrate sustained improvement and higher inflation.

Actual Weighting vs. SAAP Policy:	Underweight
ASRS Actual Weighting (May 29, 2015)	10.8%
Interest Rate Sensitive Policy	11.0%
Interest Rate Sensitive Interim Adj. Policy	16.1%

Core Fixed Income Managers

Portfolio	Market Value (\$MM) 5/29/15	%	IMD Commentary
F2 Internally Managed Account	\$1,894	49	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 which is slightly ahead of expectations.
Blackrock US Debt Index Fund	\$1,920	50	Passive strategy with history of modest outperformance.
Blackrock Intermediate Government/Credit Fund	\$24	1	Passive portfolio for System assets.
Total	3,838	100	

Arizona State Retirement System

Core Fixed Income Performance Summary as of March 31, 2015

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Core Fixed Income	2,600,149,488	7.5	1.6	3.8	5.9	3.2	4.5	5.1	8.4	Jul-75
<i>Barclays Aggregate</i>			<u>1.6</u>	<u>3.6</u>	<u>5.7</u>	<u>3.1</u>	<u>4.4</u>	<u>4.9</u>	--	<i>Jul-75</i>
<i>Over/Under</i>			0.0	0.2	0.2	0.1	0.1	0.2		
<i>eA US Core Fixed Inc Net Median</i>			1.7	3.4	5.5	3.4	4.8	5.1	--	<i>Jul-75</i>
Passive Core Fixed Income										
BlackRock US Debt Index	670,974,109	1.9	1.6	3.7	5.9	--	--	--	5.0	May-14
<i>Barclays Aggregate</i>			<u>1.6</u>	<u>3.6</u>	<u>5.7</u>	<u>3.1</u>	<u>4.4</u>	<u>4.9</u>	<u>4.8</u>	<i>May-14</i>
<i>Over/Under</i>			0.0	0.1	0.2				0.2	
<i>eA US Core Fixed Inc Net Median</i>			1.7	3.4	5.5	3.4	4.8	5.1	4.7	<i>May-14</i>
Internally Managed F2	1,904,720,113	5.5	1.6	3.8	5.9	3.3	4.6	5.2	5.7	Oct-00
<i>Barclays Aggregate</i>			<u>1.6</u>	<u>3.6</u>	<u>5.7</u>	<u>3.1</u>	<u>4.4</u>	<u>4.9</u>	<u>5.5</u>	<i>Oct-00</i>
<i>Over/Under</i>			0.0	0.2	0.2	0.2	0.2	0.3	0.2	
<i>eA US Core Fixed Inc Net Median</i>			1.7	3.4	5.5	3.4	4.8	5.1	5.7	<i>Oct-00</i>
Passive Intermediate Gov't/Credit Fixed Income										
BlackRock Intermediate Gov't/Credit Bond Index	24,455,266	0.1	1.4	2.4	3.7	2.4	3.6	--	4.9	Nov-08
<i>Barclays Int Gov't/Credit</i>			<u>1.4</u>	<u>2.3</u>	<u>3.6</u>	<u>2.3</u>	<u>3.5</u>	<u>4.3</u>	<u>4.8</u>	<i>Nov-08</i>
<i>Over/Under</i>			0.0	0.1	0.1	0.1	0.1		0.1	
<i>eA US Interm Duration Fixed Inc Net Median</i>			1.4	2.1	3.5	2.4	3.7	4.5	5.3	<i>Nov-08</i>

NOTES:

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

HIGH YIELD FIXED INCOME

High Yield Fixed Income

High yield bonds reflect the below investment-grade corporate bond market in the US. Unlike core fixed income which has a high correlation with Treasury rates, high yield bonds have 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:

Following significant spread and yield compression over the past several years, we believe expected returns in high yield market will be in the low to mid single digits going forward. As a result, we are tactically underweight the asset class as we prefer to invest in select areas of opportunistic debt which offer higher expected returns.

Actual Weighting vs. SAAP Policy:

ASRS Actual Weighting (May 29, 2015)

High Yield Fixed Income Policy

High Yield Fixed Income Interim Adj. Policy

Underweight

3.7%

4.0%

5.5%

High Yield Fixed Income Managers

Portfolio	Market Value (\$MM) 5/29/15	%	IMD Commentary
Columbia Separate Account	\$826	63	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, three and five year periods.
JP Morgan High Yield	\$492	37	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	\$1,318	100	

Changes to High Yield Fixed Income Managers

- In October 2014, following a selloff in the high yield market, ASRS added \$150 million to each of its high yield managers – Columbia and J.P. Morgan.

Arizona State Retirement System

High Yield Fixed Income Performance Summary as of March 31, 2015

	Market Value (\$)	% of Portfolio	3 Mo (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total High Yield Fixed Income	1,299,745,104	3.7	2.8	1.2	3.4	7.5	8.5	-	9.3	Oct-09
<i>Barclays High Yield</i>			<u>2.5</u>	<u>-0.4</u>	<u>2.0</u>	<u>7.5</u>	<u>8.6</u>	<u>8.2</u>	<u>9.9</u>	<i>Oct-09</i>
Over/Under			0.3	1.6	1.4	0.0	-0.1		-0.6	
<i>eA US High Yield Fixed Inc Net Median</i>			2.5	-0.5	1.9	7.1	8.3	7.6	9.5	<i>Oct-09</i>
Active High Yield Fixed Income										
Columbia Management	815,093,114	2.3	2.9	1.8	4.1	7.9	9.0	-	9.7	Oct-09
<i>Barclays High Yield</i>			<u>2.5</u>	<u>-0.4</u>	<u>2.0</u>	<u>7.5</u>	<u>8.6</u>	<u>8.2</u>	<u>9.9</u>	<i>Oct-09</i>
Over/Under			0.4	2.2	2.1	0.4	0.4		-0.2	
<i>eA US High Yield Fixed Inc Net Median</i>			2.5	-0.5	1.9	7.1	8.3	7.6	9.5	<i>Oct-09</i>
JP Morgan High Yield	484,638,236	1.4	2.5	0.2	2.3	--	--	--	6.4	Jul-13
<i>Barclays High Yield</i>			<u>2.5</u>	<u>-0.4</u>	<u>2.0</u>	<u>7.5</u>	<u>8.6</u>	<u>8.2</u>	<u>6.3</u>	<i>Jul-13</i>
Over/Under			0.0	0.6	0.3				0.1	
<i>eA US High Yield Fixed Inc Net Median</i>			2.5	-0.5	1.9	7.1	8.3	7.6	6.0	<i>Jul-13</i>

PRIVATE DEBT

Private Debt

Private debt is comprised of illiquid loans and bonds that 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 29, 2015)	4.5%
Private Debt Policy	10.0% (8-12% range)
Private Debt Interim Adj. Policy	4.5%

¹ASRS is tactically overweight based on commitments made of approximately 11.3% 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

- 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
- Demand for loans 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.
- Pending exit of GE Capital, a low cost source of funding for middle market companies, could improve market pricing (spreads, yields).
- Business Development Companies (“BDC’s”) 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) 5/29/15	Target Net Return	%	IMD Commentary
Cerberus ASRS Credit Opportunities Fund	\$1,000	537	13%	33	Partnership with ASRS to invest 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)	\$500	306	10%	19	Partnership with ASRS to invest 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.
Highbridge Principal Strategies – Cactus Direct Lending Fund, LP	\$500	31	12%	2	Partnership with ASRS to invest 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.
Pending European Senior Direct Lending Credit Fund	\$401	0	11%	0	Partnership with ASRS to invest 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 to boost returns.
H/2 Core Real Estate Debt Fund	\$350	299	6%	19	Fund 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	\$350	0	10%	0	Partnership with ASRS to invest in loans backed by consumer and commercial receivables.
Monroe Private Credit Fund A	\$350	0	11%	0	Partnership with ASRS to invest 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.
Highbridge Principal Strategies – AP Mezzanine Partners II, LP	\$221	155	11%	10	Partnership with ASRS that invests primarily in mezzanine debt to fund highly leveraged transactions for larger capitalization companies.
White Oak Separate Account	\$160	156	12%	10	Separate account invests in floating-rate secured loans for small- to mid-size companies typically lacking a deal sponsor.
Blackstone/GSO Capital Solutions Fund	\$114	114	13%	7	Fund provided rescue financing primarily to companies seeking to avoid a bankruptcy or restructuring. Investment period ended in 2013 and portfolio is now running off.
Total	\$3,946	\$1,598		100	

Changes to Private Debt Managers

- In 2015, ASRS increased the size of the following private debt mandates:
 - Cerberus ASRS Credit Opportunities Fund to \$1,000 million from \$600 million
 - RFM Cactus Holding Company, LLC to \$500 million from \$300 million.
- In 2015, ASRS made commitments to the following new fund-of-one partnerships:
 - \$500 million Highbridge Principal Strategies –Cactus Direct Lending Fund, LP
 - \$350 million Ares Cactus Private Asset Backed Fund
 - \$350 million Monroe Private Credit Fund A.
- In addition, a \$401 million commitment to a European private lending partnership is scheduled to close in June.
- With the closing of the European partnership, total commitments for private debt will be nearly \$4 billion or over 11% of the total fund (vs. an SAAP target of 10%). We believe it may take up to 3 years to fully invest these commitments.

Private Debt Performance Summary as of December 31, 2014

Deal Name	Ending Market Value	Quarter		YTD		One Year		Three Year		Inception		Inception
		TGRS ⁽³⁾⁽⁴⁾	TNET ⁽³⁾⁽⁴⁾	IRR ⁽⁵⁾								
Corporate												
Blackstone / GSO Capital Solutions Fund LP ⁽⁶⁾	\$ 124,154,700	-4.30%	-3.44%	4.31%	3.50%	4.31%	3.50%	N/A	N/A	18.21%	14.02%	16.11%
Cerberus ASRS Credit Opportunities Fund, L.P.	492,922,540	3.17%	2.71%	16.94%	14.20%	16.94%	14.20%	N/A	N/A	16.80%	13.98%	13.99%
Highbridge Principal Strategies and Mezzanine Partners II, L.P.	152,442,310	6.37%	4.98%	20.46%	15.47%	20.46%	15.47%	N/A	N/A	17.25%	12.97%	15.23%
White Oak Global Advisors Private Debt	142,963,360	8.90%	7.35%	21.44%	17.07%	21.44%	17.07%	N/A	N/A	29.76%	23.62%	21.76%
Total Corporate	\$ 912,482,909	3.21%	2.68%	16.15%	13.11%	16.15%	13.11%	N/A	N/A	20.77%	16.27%	15.52%
Real Estate												
H/2 Core Real Estate Debt Fund L.P.	\$ 362,212,041	1.05%	0.90%	5.17%	4.51%	5.17%	4.51%	N/A	N/A	5.85%	5.19%	5.10%
RFM Cactus Holding Company, LLC	226,252,196	1.54%	1.08%	8.91%	7.81%	8.91%	7.81%	N/A	N/A	9.40%	8.10%	7.59%
Total Real Estate	\$ 588,464,237	1.29%	0.99%	6.67%	5.81%	6.67%	5.81%	N/A	N/A	27.81%	24.66%	6.17%
Total Portfolio	\$ 1,500,947,146	2.58%	2.12%	13.09%	10.76%	13.09%	10.76%	N/A	N/A	18.62%	14.66%	13.10%

S&P/LSTA INDEX ⁽⁷⁾

S&P/LSTA Index +250 bps (for a one year period) ⁽⁸⁾

Quarter	YTD	One Year	Three Year	Inception
-0.51%	1.60%	1.60%	N/A	4.72%
0.12%	4.10%	4.10%	N/A	7.22%

Notes:

1. Time Weighted Returns are calculated as the geometric mean of the holding period returns of each underlying investment since the first full quarter after the investment's inception to the report date. Each holding period return is calculated on a quarterly basis by dividing the fund's gain (gross or net depending on the type of report) and income over the time-weighted net capital in every period. Time weighted net capital is equal to the sum of each period's beginning balance and the subsequent cash flows, which are weighted based on the number of days that each cash flow has been outstanding during the corresponding quarter.

2. The Time Weighted Return is a periodic return, which means that the result corresponds to the return achieved by each underlying investment during the measured period (first full quarter after inception to report date). For comparability purposes and in order to provide a more meaningful result, the TWR is annualized for the cases where funds operational period is more than a year.

3. Gross TWR includes Inside Income, Outside Income and Appreciation. Net TWR is equals to Gross TWR plus management fees and expenses (whether inside or outside of the partnership). The TWR is annualized for the cases where funds operational period is more than a year. For periods less than one year, the returns are not annualized.

TGRS- Total Gross Return ; TNET- Total Net Return

4. Returns have been compressed to begin with first full quarter and eliminate partial periods. IRR calculations use actual cash flow dates.

5. The Net IRR is calculated using all outflows to and inflows from the fund investments, including cash flows for expenses and fees paid by the portfolio of those investments.

6. Effective 07/01/12 Blackstone/GSO Capital Solutions Fund LP was transferred from ASRS Opportunistic Portfolio to ASRS Private Debt Portfolio. Cash flows are from 07/01/12.

7. S&P/LSTA Index - The S&P/LSTA U.S Leveraged Loan index

8. S&P/LSTA Index - The S&P/LSTA U.S Leveraged Loan index plus 250 bps (for a one year period). Therefore, the bps is prorated for Quarter, YTD returns and becomes static 250 bps for One Year and Three Year and Inception.

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 11.5% through 12/31/14.

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 \$1.2 billion of commitments (representing approximately 3.4% of the total fund) to ongoing opportunistic debt partnerships and \$0.4 billion of investments (representing approximately 1.1% of the total fund) in partnerships that are in liquidation.

Actual Weighting vs. SAAP Policy Target:

ASRS Actual Weighting (May 29, 2015)	2.9%
Opportunistic Debt Policy	0.0% (0-10% ¹ range)

¹ Range of 0-10% includes opportunistic debt, opportunistic equity and opportunistic inflation-linked.

Opportunistic Debt Managers Funds Making New Investments

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/29/15	Target Net Return	%	IMD Commentary
GSO Cactus Credit Opportunities Fund	\$350	\$305	12%	47	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	\$0	12%	0	\$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	\$320	12%	50	Fund utilizes a multi-strategy approach to allocate to both distressed structured and corporate credit as it sees fit based on the opportunity.
Fortress MSR Opportunities Fund II	\$200	\$21	12%	3	Fund invests in excess mortgage-servicing rights.
Total	\$1,200	\$646		100	

Opportunistic Debt Managers Funds in Liquidation

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/29/15	Target Net Return	%	IMD Commentary
Avenue Europe Capital Partners II	\$186	\$186	15%	48	Fund invests in distressed debt of European companies. Investment period ended in 2014.
Oaktree Opportunities Fund VIIIb	\$149	\$149	15%	38	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2014.
Oaktree Opportunities Fund VIII	\$29	\$29	15%	7	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2012.
TCW Capital Trust	\$25	\$25	10%	6	Fund invests in four asset classes: leveraged loans, high yield bonds, private debt and mezzanine debt. Investment period ended in 2013.
Funds Close to Being Fully Liquidated	\$3	\$3	10-14%	1	Remaining funds primarily in Blackrock Credit Investors II.
Total	\$392	\$392		100	

Changes to Opportunistic Debt Managers

- In June, ASRS added the following new opportunistic debt mandates to invest in European distressed debt:
 - \$250 million commitment to Avenue-ASRS Europe Opportunities Fund, a fund-of-one partnership; and
 - \$100 million commitment to Avenue Europe Capital Partners III, a co-mingled fund.
- The investment periods of the following mandates ended and the funds are returning capital:
 - Avenue Europe Capital Partners II
 - Oaktree Opportunities Fund VIIIb

Opportunistic Debt Performance Summary as of December 31, 2014

Deal Name	Ending Market Value	Quarter		YTD		One Year		Three Year		Inception		Inception
		TGRS ⁽²⁾⁽⁴⁾	TNET ⁽²⁾⁽⁴⁾	IRR ⁽¹⁾								
Avenue Europe Special Situations Fund II (U.S.), L.P.	259,489,156	0.41%	0.11%	15.09%	9.66%	15.09%	9.66%	N/A	N/A	12.03%	7.46%	8.33%
Blackrock Credit Investors II, L.P.	\$ 2,464,320	-7.73%	-6.22%	10.39%	12.58%	10.39%	12.58%	14.59%	12.96%	22.44%	18.27%	15.76%
Blackrock Mortgage Investors, LP	6,224	-64.14%	-13.11%	-46.70%	1.79%	-46.70%	1.79%	-7.82%	11.08%	-0.79%	7.16%	8.15%
Blackstone / GSO Capital Solutions Fund LP ⁽⁸⁾	-	N/A	14.61%	13.89%	12.81%							
Credit Suisse Fixed Income Opportunistic Fund ⁽⁹⁾	-	N/A	27.71%	25.99%	10.19%							
Fortress MSR Opportunities Fund II A LP	12,425,831	2.57%	2.36%	31.46%	30.31%	31.46%	30.31%	N/A	N/A	23.72%	22.80%	19.62%
GSO Cactus Credit Opportunities Fund LP	250,100,841	-3.89%	-3.89%	7.53%	7.53%	N/A	N/A	N/A	N/A	7.53%	7.53%	7.75%
Guggenheim Partners Asset Management	-	95.17%	95.17%	93.53%	93.53%	93.53%	93.53%	34.66%	34.13%	26.40%	25.78%	15.84%
Hyperion Asset Management	-	N/A	12.36%	11.47%	17.82%							
Oaktree Opportunities Fund VIII, L.P.	33,589,610	0.38%	0.06%	4.74%	3.53%	4.74%	3.53%	13.97%	12.71%	12.44%	10.80%	11.16%
Oaktree Opportunities Fund VIIIb, L.P.	167,972,936	-2.98%	-3.27%	4.14%	2.91%	4.14%	2.91%	12.05%	9.66%	12.26%	9.34%	8.52%
OZ Credit Opportunities Domestic Partners, L.P.	320,020,001	1.45%	1.13%	12.10%	9.02%	12.10%	9.02%	N/A	N/A	12.10%	9.02%	8.04%
SANKATY ADVISORS LLC ⁽⁷⁾	-	N/A	19.28%	18.84%	-1.98%							
TCW Capital Trust	34,569,366	0.49%	0.16%	4.85%	3.27%	4.85%	3.27%	9.43%	7.31%	10.11%	8.00%	8.35%
TCW Credit Opportunities Fund, L.P. ⁽⁸⁾	-	N/A	17.24%	16.27%	21.48%							
Total	\$ 1,080,618,285	-0.59%	-0.83%	10.48%	7.64%	10.48%	7.64%	12.65%	10.36%	10.20%	8.64%	11.46%

Notes:

1. Time Weighted Returns are calculated as the geometric mean of the holding period returns of each underlying investment since the first full quarter after the investment's inception to the report date. Each holding period return is calculated on a quarterly basis by dividing the fund's gain (gross or net depending on the type of report) and income over the time-weighted net capital in every period. Time weighted net capital is equal to the sum of each period's beginning balance and the subsequent cash flows, which are weighted based on the number of days that each cash flow has been outstanding during the corresponding quarter.

2. The Time Weighted Return is a periodic return, which means that the result corresponds to the return achieved by each underlying investment during the measured period (first full quarter after inception to report date). For comparability purposes and in order to provide a more meaningful result, the TWR is annualized for the cases where funds operational period is more than a year.

3. Gross TWR includes Inside Income, Outside Income and Appreciation. Net TWR is equal to Gross TWR plus management fees and expenses (whether inside or outside of the partnership). The TWR is annualized for the cases where funds operational period is more than a year. For periods less than one year, the returns are not annualized. TGRS- Total Gross Return ; TNET- Total Net Return

4. Returns have been compressed to begin with first full quarter and eliminate partial periods. IRR calculations use actual cash flow dates.

5.- Hyperion Asset Management and TCW Credit Opportunity have been liquidated in Q3 2010

6. The Net IRR is calculated using all outflows to and inflows from the fund investments, including cash flows for expenses and fees paid by the portfolio of those investments.

7. Sankaty Advisors LLC has been liquidated in Q212.

8. Credit Suisse Fixed Income Opportunistic has been liquidated in Q312.

9. Blackstone/GSO cash flows were transferred effective July 1, 2012 to ASRS Private Debt Portfolio. Cash flows in ASRS Opportunistic are from inception to 6/30/12.

APPENDICES

1. Fixed Income Market Environment
2. ASRS Strategic Asset Allocation Policy Schematic

APPENDIX 1

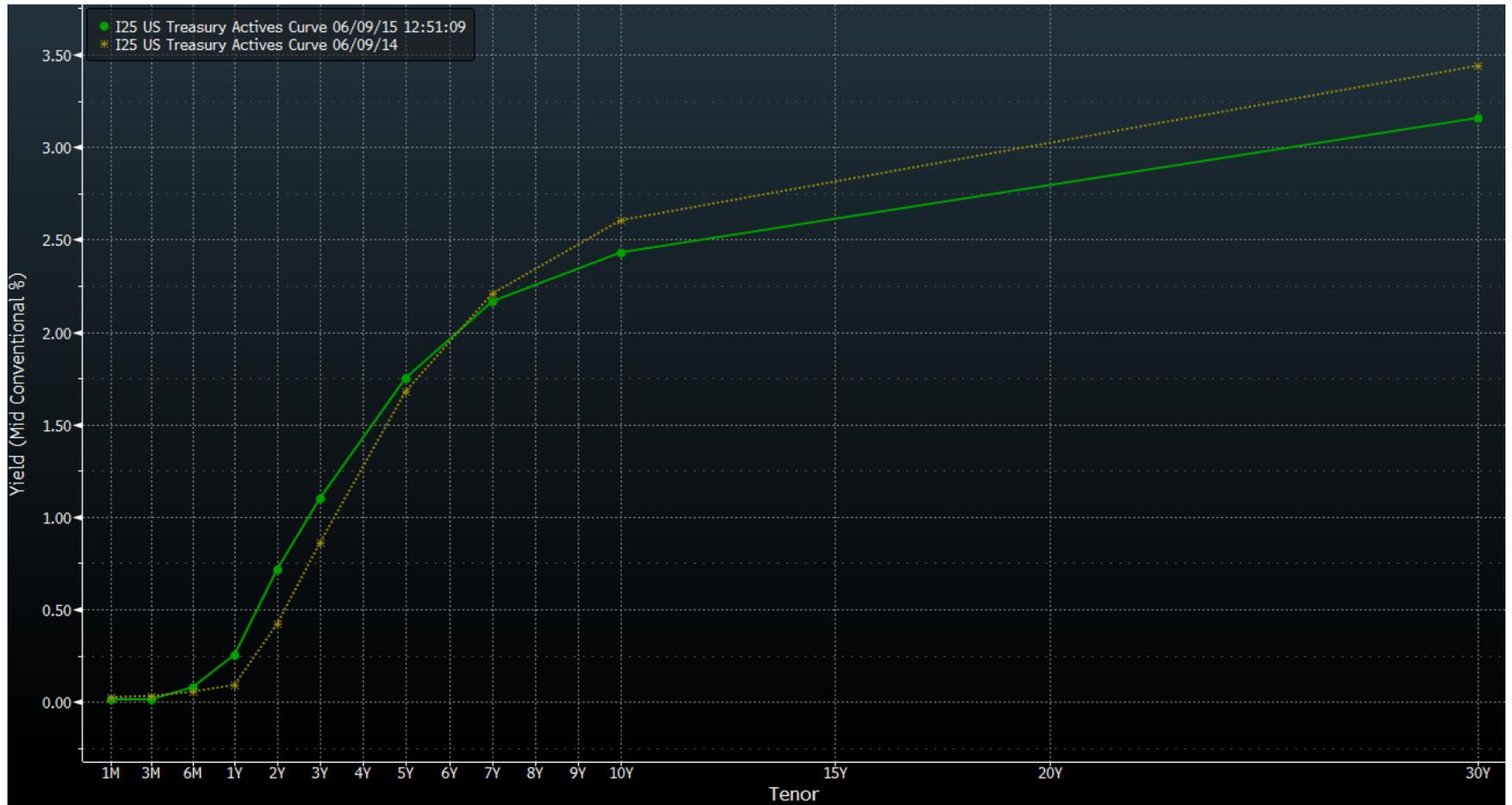
FIXED INCOME MARKET ENVIRONMENT

Core Fixed Income

Barclays US Aggregate Index Yield-to-Worst 2005 – 2015



Yield Curve



10 Year U.S. Treasury Bond Yield 2005 - 2015



30 Year U.S. Treasury Bond Yield 2005 – 2015



Corporate Investment Grade Spreads

Option Adjusted Spreads (OAS) 2005 – 2015



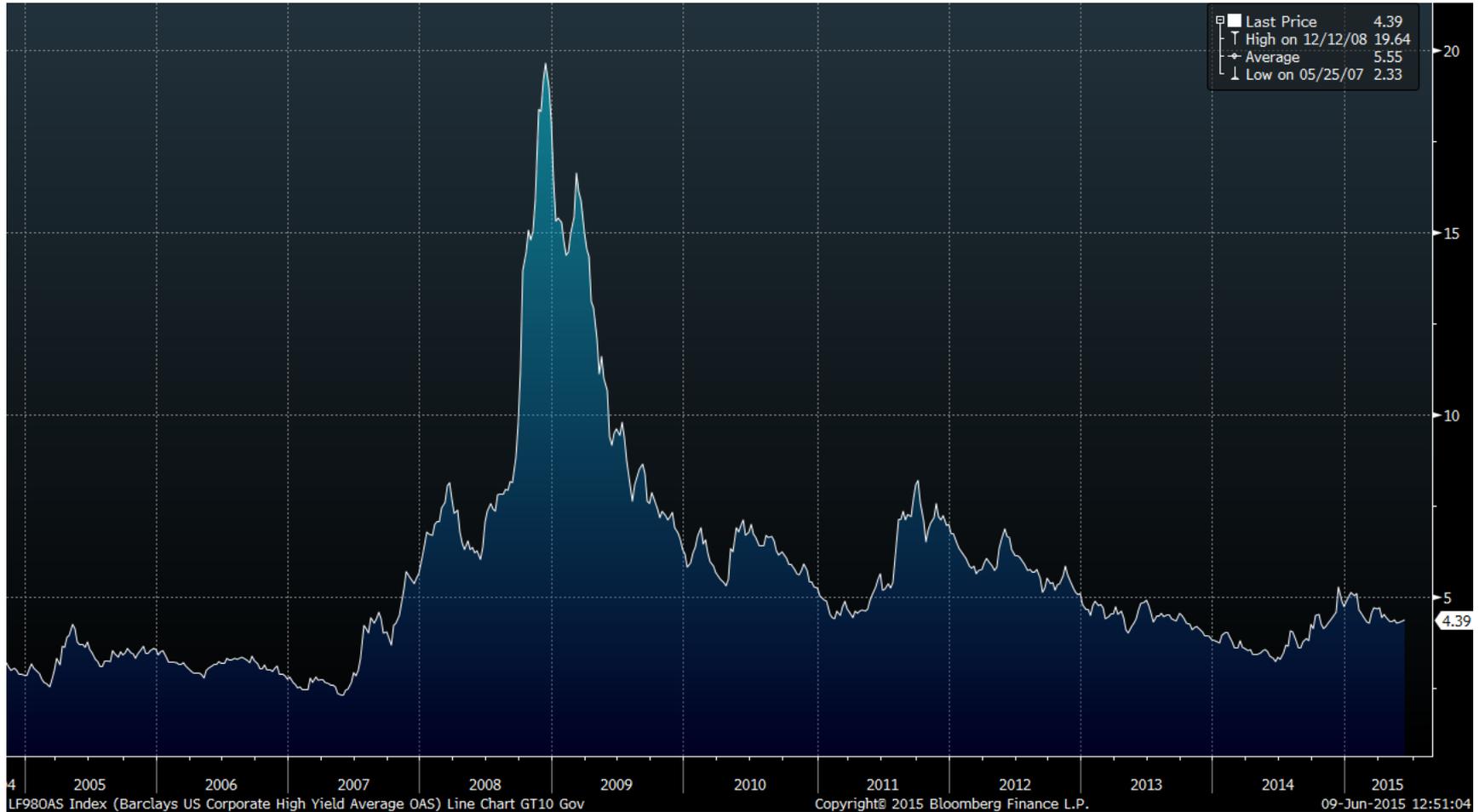
US Mortgage-Backed Securities Spreads

Option Adjusted Spreads (OAS) 2005 – 2015

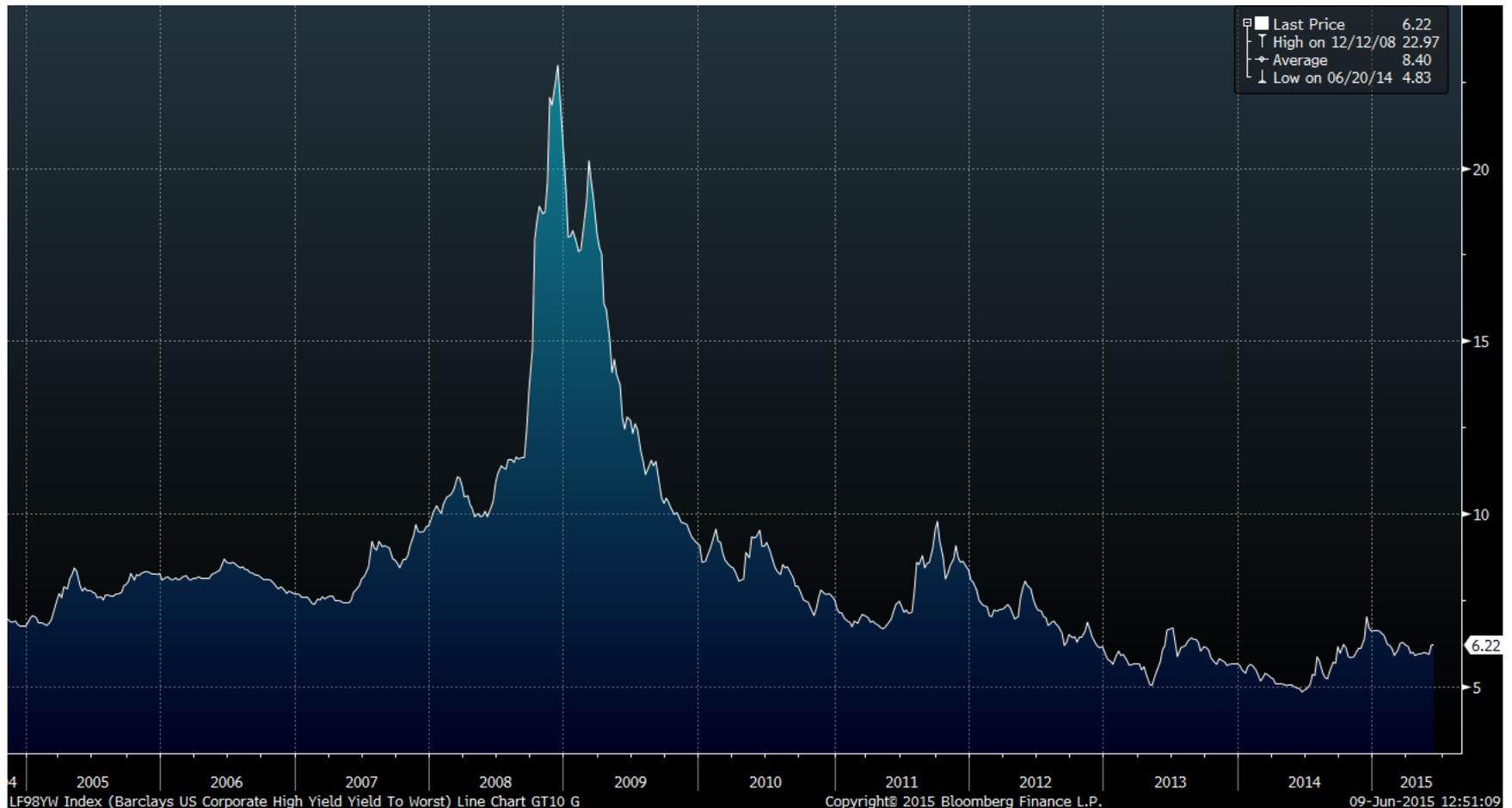


High Yield Fixed Income

Barclays US Corporate High Yield Index Option Adjusted Spread (OAS) 2005 – 2015



Barclays US Corporate High Yield Index Yield-to-Worst 2004 – 2014



Sovereign Bond Yields

10 Year German Bund Yield 2005 - 2015



10 Year Japanese Government Bond Yield 2005 - 2015



Emerging Market Local Debt Index 2005 - 2015



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%		