



COMPTROLLER'S INVESTMENT ADVISORY BOARD

# ENDOWMENT PORTFOLIO REVIEW

Q<sup>3</sup>  
2015



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*As of September 30, 2015*

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# Asset Allocation Summary

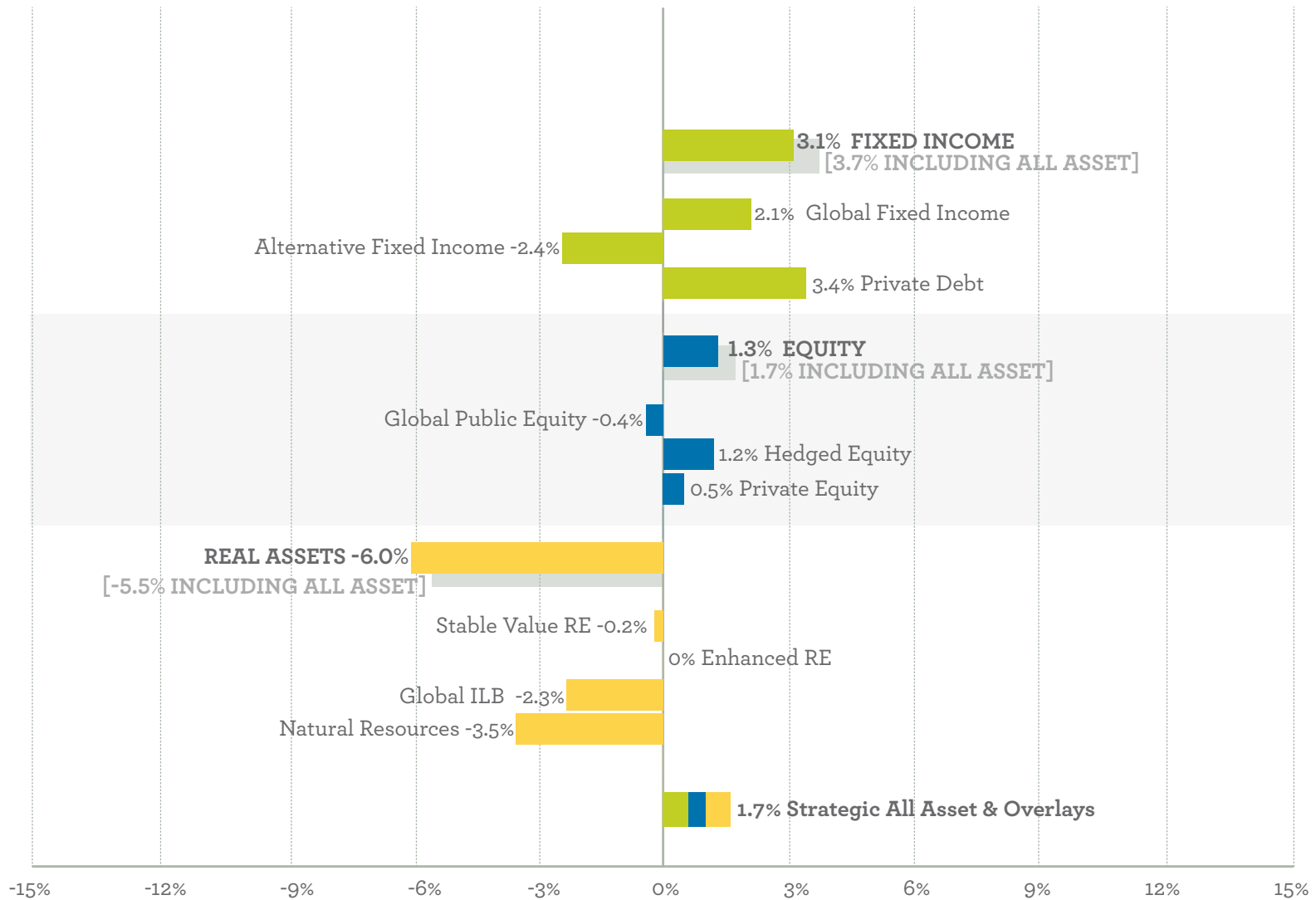
As of September 30, 2015

Asset Class	Strategy	Current Market Value	Weight	Long-Term Target	Policy Range
<b>Fixed Income</b>		<b>\$1,344,971,958</b>	<b>38.1%</b>	<b>35.0%</b>	<b>20-50%</b>
	Global Fixed Income <sup>1</sup>	426,229,157	12.1%	10.0%	
	Alternative Fixed Income	623,675,449	17.6%	20.0%	
	Private Debt	295,067,352	8.4%	5.0%	
<b>Equity</b>		<b>\$1,636,181,494</b>	<b>46.3%</b>	<b>45.0%</b>	<b>30-60%</b>
	Global Public Equity	515,599,378	14.6%	15.0%	
	Hedged Equity	749,794,548	21.2%	20.0%	
	Private Equity	370,787,568	10.5%	10.0%	
<b>Real Assets</b>		<b>\$493,001,669</b>	<b>14.0%</b>	<b>20.0%</b>	<b>10-30%</b>
	Stable Value Real Estate	168,743,180	4.8%	5.0%	
	Enhanced Real Estate	176,587,834	5.0%	5.0%	
	Global ILB	23,598,000	0.7%	3.0%	
	Natural Resources	124,072,655	3.5%	7.0%	
<b>Strategic All Asset &amp; Overlays</b>		<b>\$60,500,565</b>	<b>1.7%</b>	<b>0.0%</b>	<b>0-10%</b>
	All Asset Strategies	60,500,565	1.7%	0.0%	
<b>Total Portfolio</b>		<b>\$3,534,655,687</b>	<b>100.0%</b>	<b>100.0%</b>	

<sup>1</sup> Includes cash

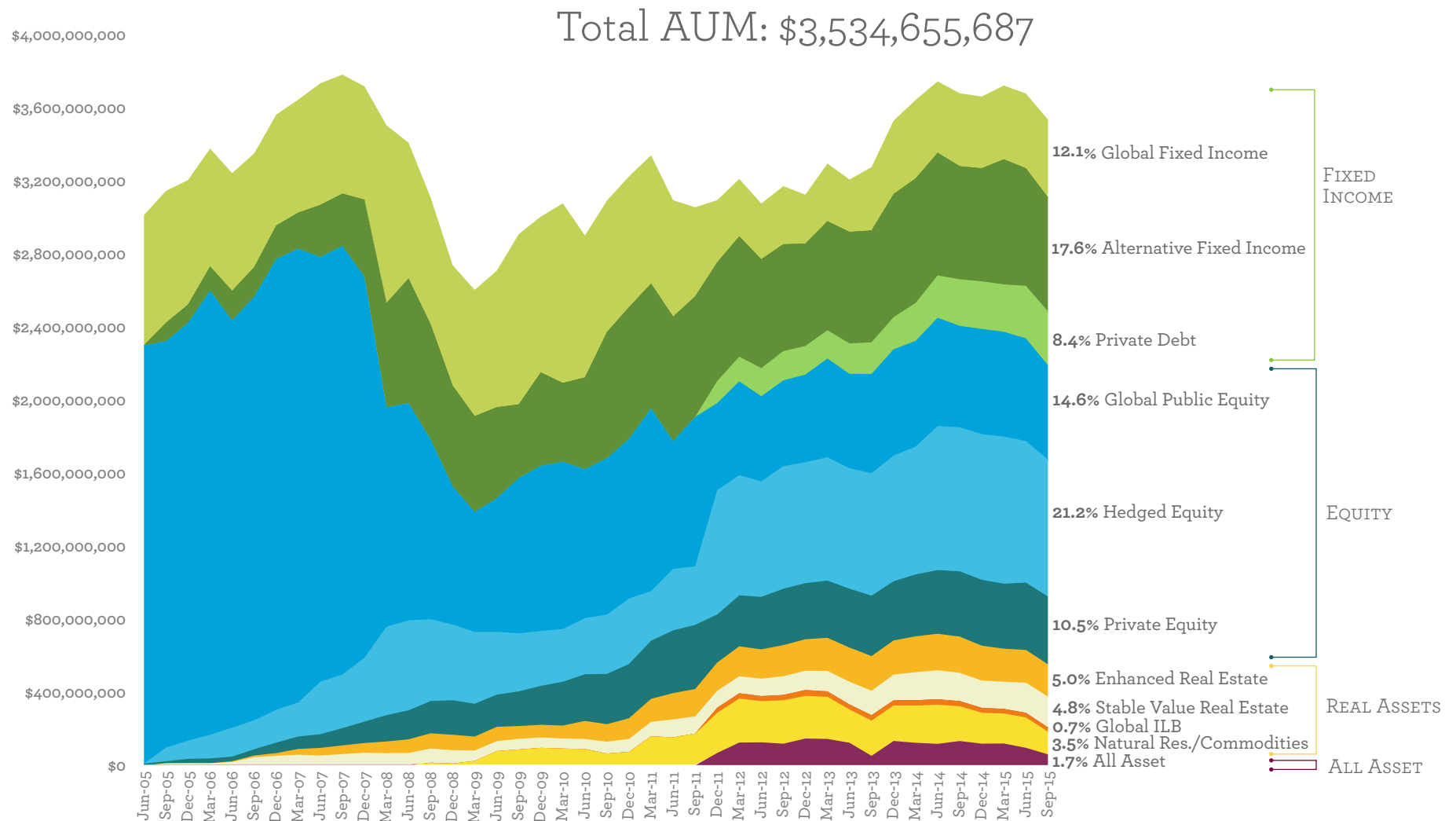
# Actual vs. Target Allocations

As of September 30, 2015



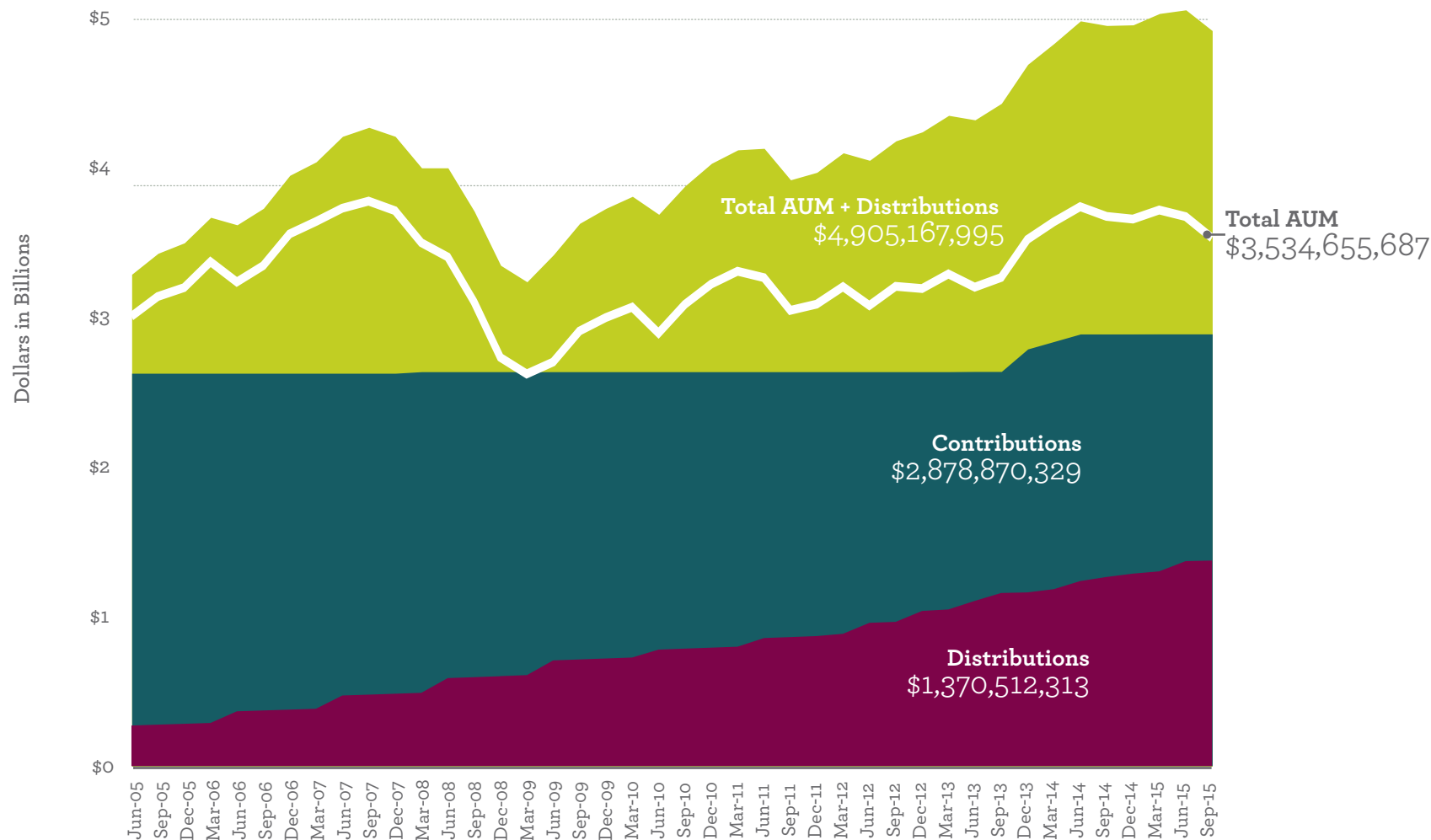
# Asset Allocation Evolution (Actual)

As of September 30, 2015



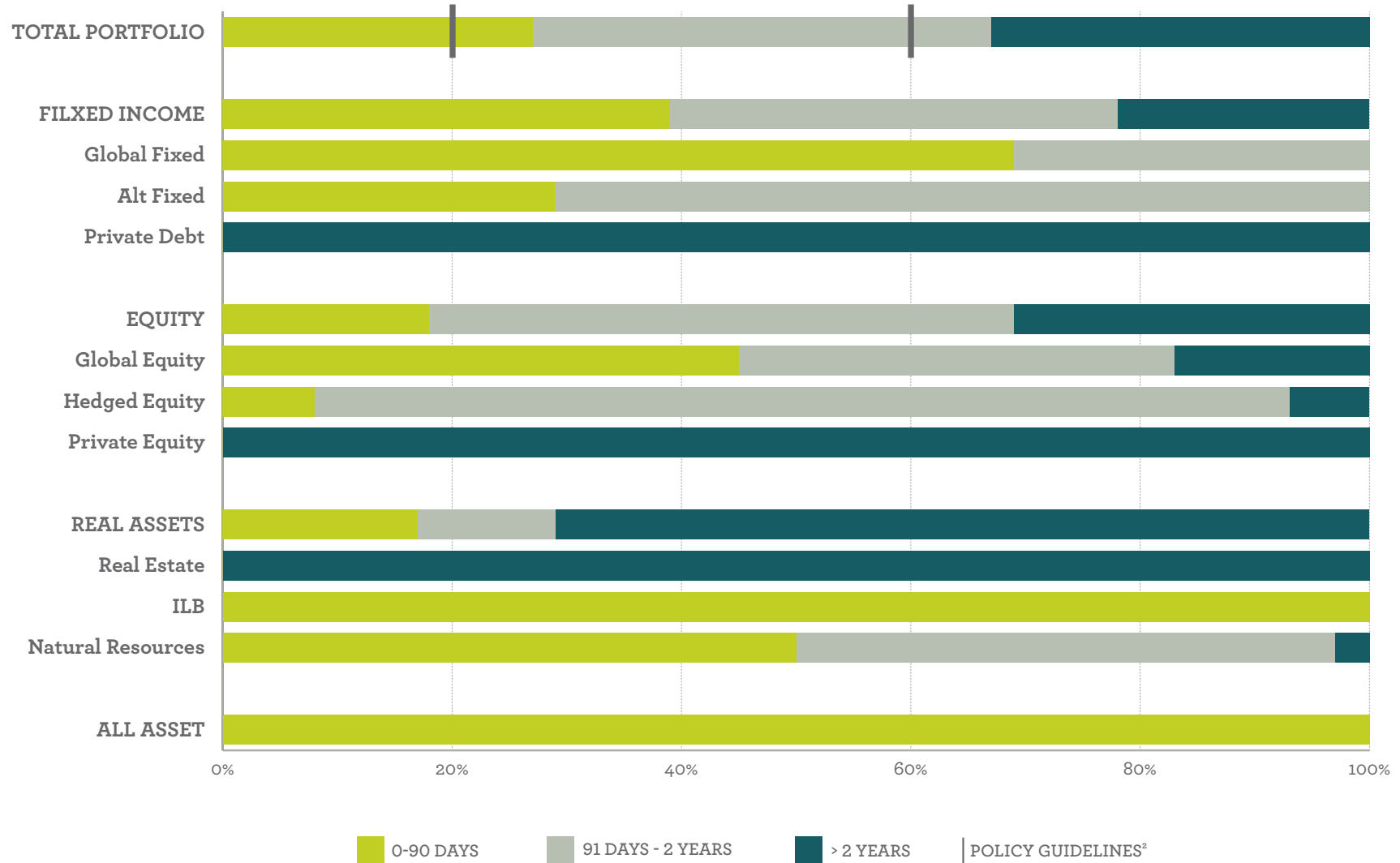
# Contributions & Distributions

As of September 30, 2015



# Portfolio Liquidity<sup>1</sup>

As of September 30, 2015



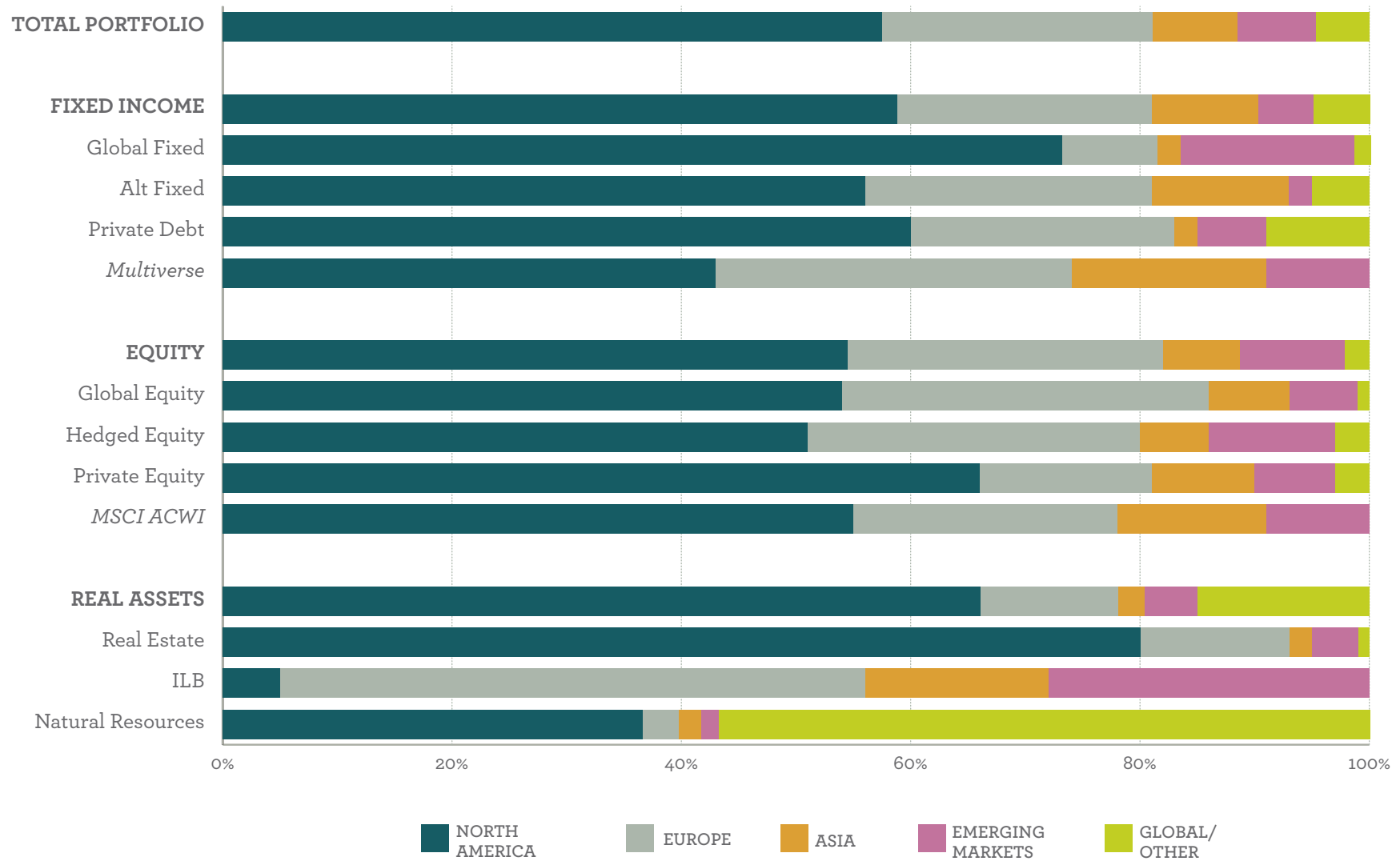
<sup>1</sup> Projected liquidity takes hard lock, soft lock, notice and payout periods into consideration.

<sup>2</sup> Policy Guidelines: Minimum of 20% in 0-40 day bucket and minimum of 60% combined in 0-40 and 41-185 day buckets



# Portfolio Geographic Allocation<sup>1</sup>

As of September 30, 2015



<sup>1</sup> Calculated using gross exposures.

# Fixed Income Summary

As of September 30, 2015

Strategy	Market Value	Portfolio Weight	Standard Deviation <sup>1</sup>	Sharpe Ratio <sup>1</sup>	Downside Deviation <sup>1</sup>	Max Drawdown <sup>1</sup>	% Positive Months <sup>1</sup>	BC Multiverse		HFRI Conservative	
								Beta <sup>1</sup>	Correlation <sup>1</sup>	Beta <sup>1</sup>	Correlation <sup>1</sup>
Global Fixed Income & Cash	\$426,229,157	12.1%	2.8%	0.0	3.3%	-5.0%	53.0%	0.4	0.6	0.7	0.6
Global Fixed Income (ex-cash)	270,427,963	7.7%	3.3%	0.0	3.8%	-6.0%	52.8%	0.5	0.6	0.9	0.6
Cash	155,801,193	4.4%	-	-	-	-	-	-	-	-	-
Barclays Multiverse			3.8%	-0.4	4.1%	-7.1%	44.4%	1.0	1.0	0.1	0.1
Alternative Fixed Income	\$623,675,449	17.6%	3.9%	0.7	5.2%	-4.4%	72.2%	0.4	0.4	1.3	0.8
Event Driven	205,666,917	5.8%	-	-	-	-	-	-	-	-	-
HFRI Event Driven (Total) Index			4.4%	1.0	4.7%	-6.7%	66.7%	0.2	0.2	1.7	0.9
Relative Value	278,426,987	7.9%	-	-	-	-	-	-	-	-	-
HFRI Relative Value (Total) Index			2.6%	1.7	2.7%	-3.2%	72.2%	0.3	0.4	0.9	0.9
Tactical Trading	134,973,840	3.8%	-	-	-	-	-	-	-	-	-
HFRI Macro (Total) Index			3.9%	0.2	3.9%	-4.2%	52.8%	0.1	0.1	0.8	0.5
Fund of Funds	4,607,705	0.1%	-	-	-	-	-	-	-	-	-
HFRI FoF: Conservative			2.4%	1.7	2.5%	-2.4%	72.2%	0.0	0.1	1.0	1.0
Private Debt	\$295,067,352	8.4%	-	-	-	-	-	-	-	-	-
Total Fixed Income	\$1,344,971,958	38.1%	2.7%	1.1	3.4%	-2.9%	72.2%	0.3	0.5	0.9	0.8

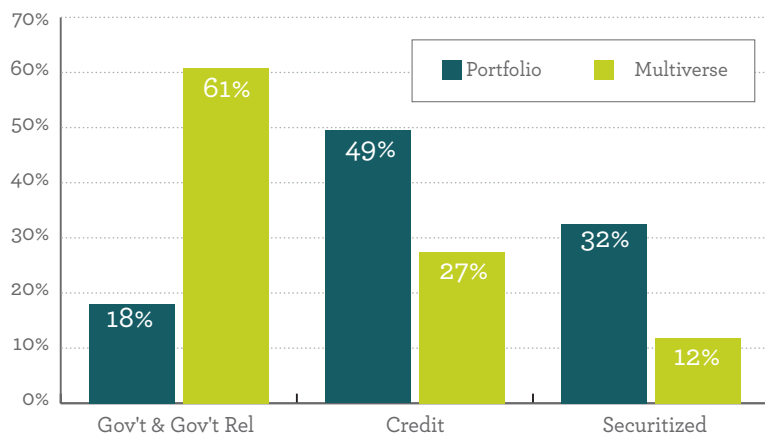
<sup>1</sup>Trailing 36 months.

# Fixed Income Detail

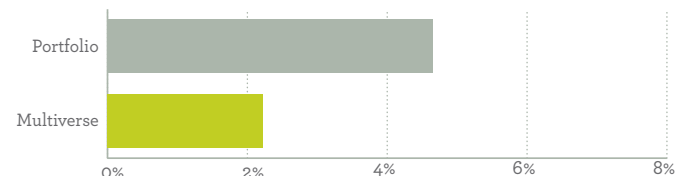
As of September 30, 2015

Global Fixed  
ex-cash

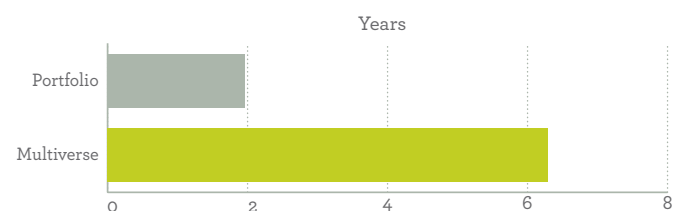
## Sector Allocation



## Yield

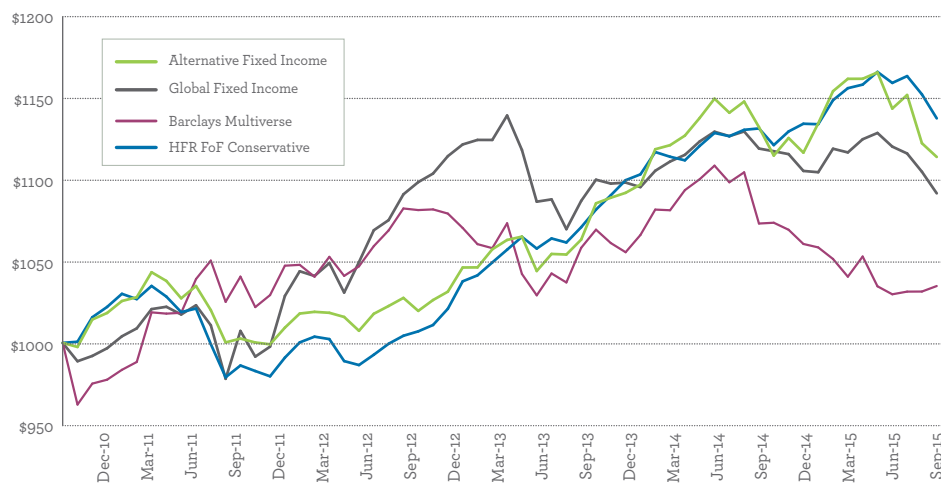


## Duration



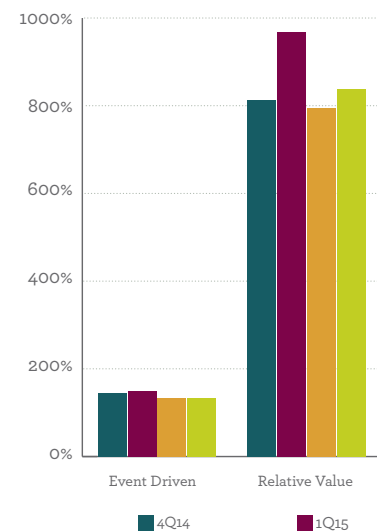
## Growth of \$1,000<sup>1</sup>

Fixed Income

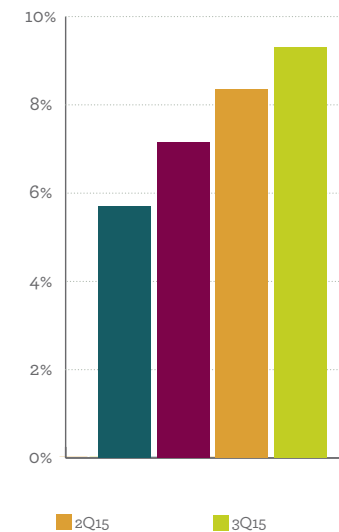


<sup>1</sup> Trailing 5 year

## Gross Exposure by Strategy



## VaR of Tactical Trading Strategy<sup>1</sup>



<sup>1</sup> One month 95% confidence extrapolated ex-ante VaR provided by the managers.

# Equity Summary

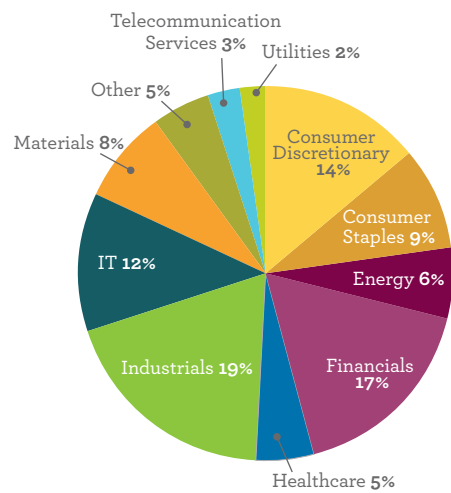
As of September 30, 2015

Strategy	Market Value	Portfolio Weight	Standard Deviation <sup>1</sup>	Sharpe Ratio <sup>1</sup>	Downside Deviation <sup>1</sup>	Max Drawdown <sup>1</sup>	% Positive Months	MSCI ACWI		HFRI Strategic	
								Beta <sup>1</sup>	Correlation <sup>1</sup>	Beta <sup>1</sup>	Correlation <sup>1</sup>
Global Equity	\$515,599,378	14.6%	9.5%	1.0	10%	-12.7%	66.7%	0.9	1.0	1.9	0.9
MSCI ACWI			10.0%	0.7	11%	-11.6%	63.9%	-	-	2.0	0.9
Hedged Equity	749,794,548	21.2%	5.5%	1.1	6%	-5.6%	69.4%	0.5	0.9	1.2	0.9
HFRI FoF: Strategic			4.4%	0.9	5%	-6.7%	61.1%	0.4	0.9	-	-
Private Equity	370,787,568	10.5%									
Total Equity	\$1,636,181,494	46.3%	5.6%	1.6	5%	-5.9%	63.9%	0.5	1.0	1.2	0.9

<sup>1</sup> Trailing 36 months

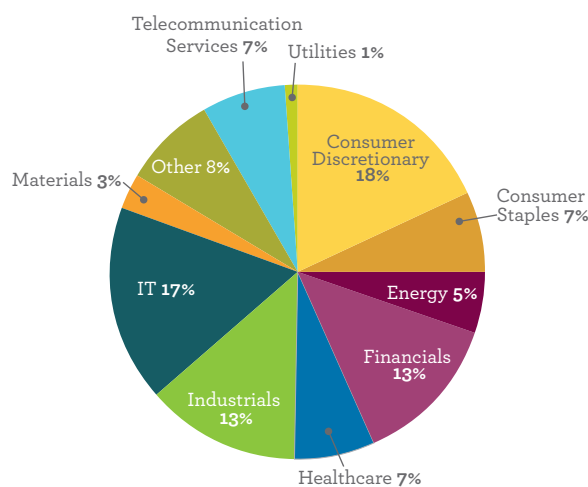
## Sector Allocation<sup>1</sup>

### Global Equity

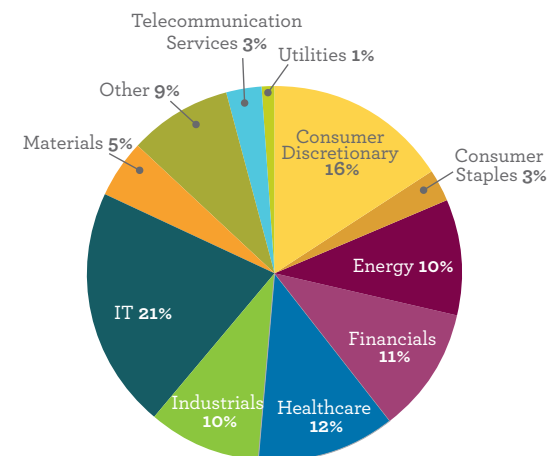


<sup>1</sup> Calculated using gross exposures

### Hedged Equity



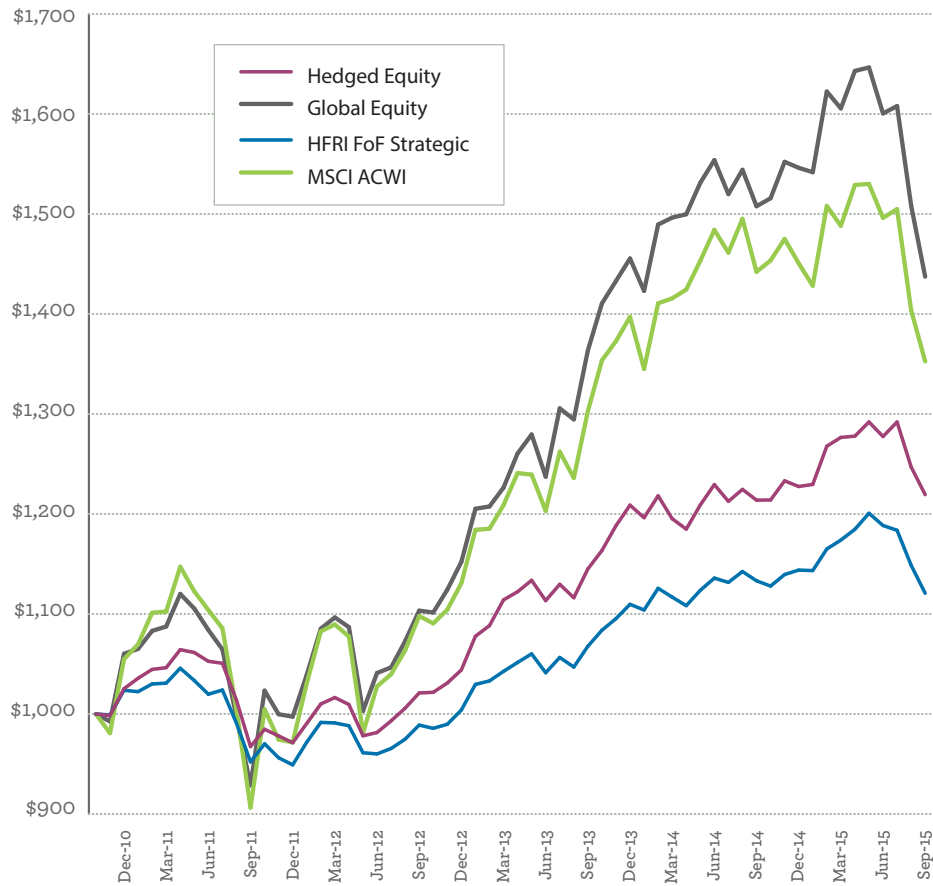
### Private Equity



# Public Equity Detail

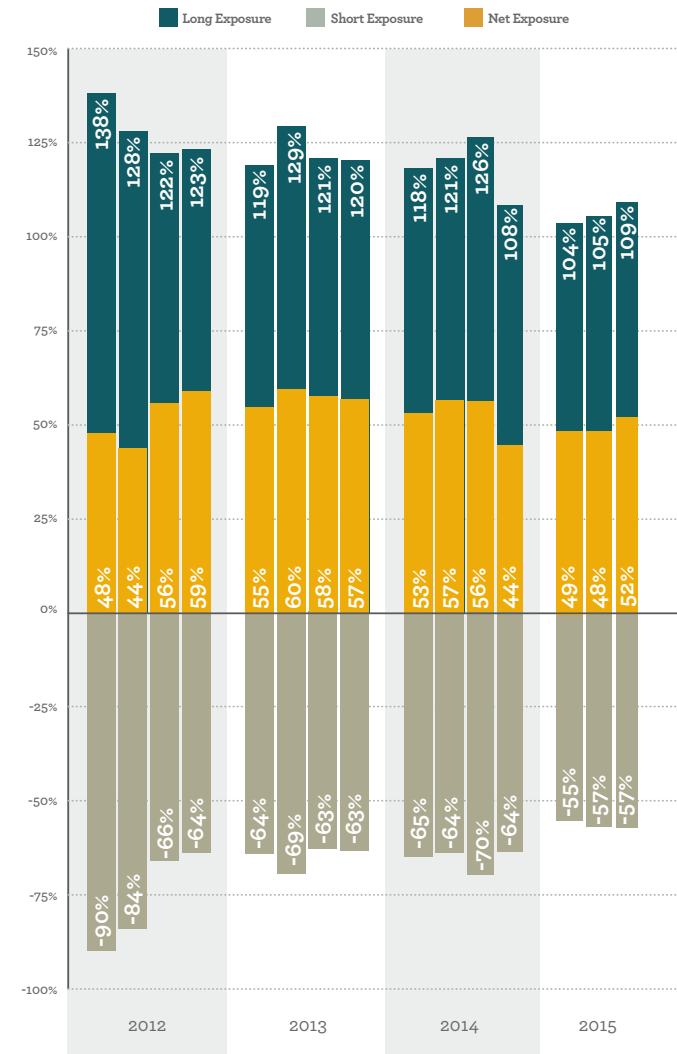
As of September 30, 2015

## Growth of \$1,000<sup>1</sup>



<sup>1</sup> Trailing 5 year

## Exposure by Quarter - Hedged Equity



# Private Equity Detail

As of September 30, 2015

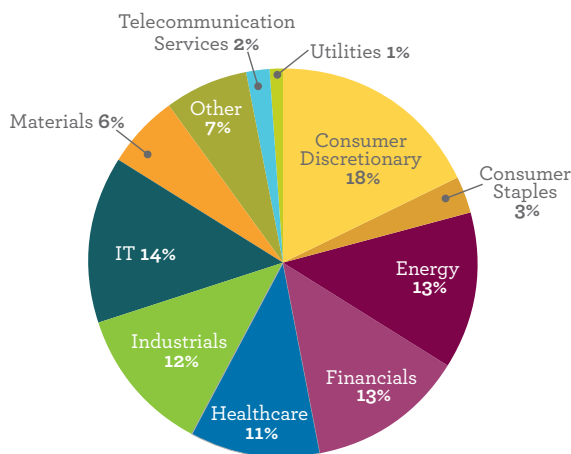
Strategy	Number of Fund Commitments	Commitments	Unfunded Commitments	Total Contributions <sup>1</sup>	Distributions	Remaining Value <sup>2</sup>	Total Value
Buyout	44	\$477,452,278	\$107,742,069	\$399,352,992	\$250,886,039	\$288,786,734	\$539,672,773
Venture Capital	13	152,050,000	51,574,239	101,014,084	50,442,940	82,000,834	132,443,775
<b>Total Private Equity</b>	<b>57</b>	<b>\$629,502,278</b>	<b>\$159,316,308</b>	<b>\$500,367,076</b>	<b>\$301,328,979</b>	<b>\$370,787,568</b>	<b>\$672,116,548</b>

<sup>1</sup>Total Contributions include fees and expenses that may not reduce or lower unfunded commitment.

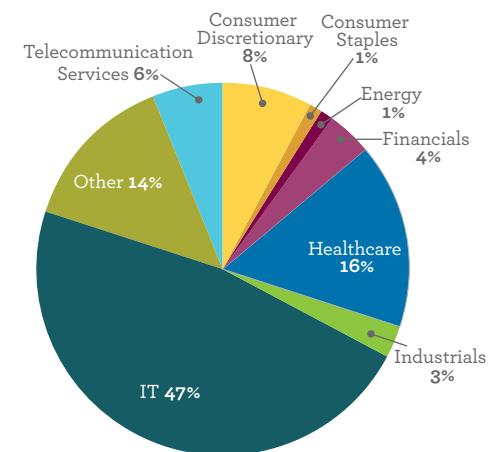
<sup>2</sup>Remaining Value is equal to the last actual reported capital account value plus subsequent capital calls less subsequent distributions through the indicated date, with no valuation changes.

Strategy	Distributed/Paid In (DPI)	Total Value/Paid In (TVPI)	1 Year IRR	ITD IRR	Time Weighted Returns		
					1 Year	3 Year	5 Year
Buyout	0.63	1.35	8.5%	8.8%	8.5%	13.5%	13.5%
Venture	0.50	1.31	15.0%	4.6%	14.8%	15.0%	15.5%
<b>Total Private Equity</b>	<b>0.60</b>	<b>1.34</b>	<b>9.8%</b>	<b>7.4%</b>	<b>9.8%</b>	<b>13.8%</b>	<b>13.5%</b>
<i>State Street Private Equity Index</i>					<i>7.3%</i>	<i>13.9%</i>	<i>7.8%</i>

## Buyout Sector Allocation



## Venture Sector Allocation



# Real Assets Summary

*As of September 30, 2015*

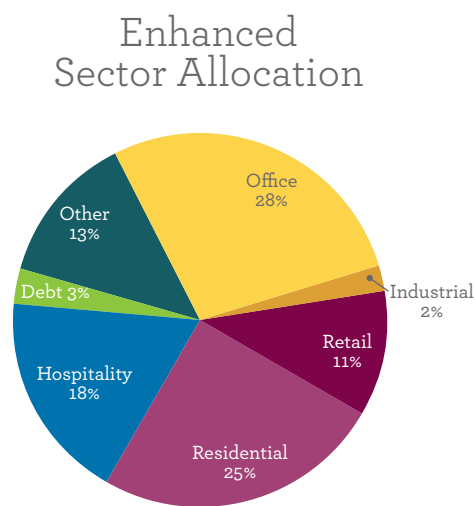
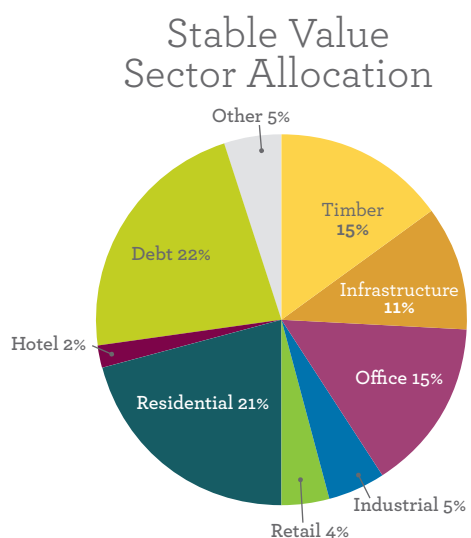
Strategy	Market Value	Portfolio Weight	Target Weight
Real Estate	\$345,331,014	9.8%	10.0%
Stable	168,743,180	4.8%	5.0%
Enhanced	176,587,834	5.0%	5.0%
ILB	\$23,598,000	0.7%	3.0%
Natural Resources	\$124,072,655	3.5%	7.0%
Commodity	85,935,545	2.4%	5.0%
Resource Securities - Public	35,119,682	1.0%	2.0%
Resource Securities - Private	3,017,428	0.1%	
Total Real Assets	\$493,001,669	14.0%	20.0%

# Real Estate Detail

As of September 30, 2015

Strategy	Number of Fund Commitments	Commitments	Unfunded Commitments	Total Contributions	Distributions	Remaining Value	Total Value
Stable Value	16	\$255,501,071	\$62,305,474	\$203,957,876	\$93,572,561	\$168,743,180	\$262,315,741
Enhanced Return	34	\$358,852,865	\$83,242,090	\$307,804,120	\$214,641,187	\$176,587,834	\$391,229,021
<b>Total Real Estate</b>	<b>50</b>	<b>\$614,353,936</b>	<b>\$145,547,564</b>	<b>\$511,761,996</b>	<b>\$308,213,747</b>	<b>\$345,331,014</b>	<b>\$653,544,762</b>

Strategy	Distributed/Paid In (DPI)	Total Value/Paid In (TVPI)	1 Year IRR	ITD IRR	Time Weighted Returns		
					1 Year	3 Year	5 Year
Stable Value	0.46	1.29	7.8%	7.5%	7.7%	9.3%	7.1%
<i>Stable Value RE Blend</i>					13.4%	12.0%	10.2%
Enhanced Return	0.70	1.27	20.4%	6.4%	19.1%	16.8%	15.3%
<i>Enhanced RE Blend</i>					13.6%	13.5%	14.5%
<b>Total Real Estate</b>	<b>0.60</b>	<b>1.28</b>	<b>14.5%</b>	<b>6.8%</b>	<b>13.9%</b>	<b>-</b>	<b>-</b>
<i>Real Estate Blend</i>					13.5%		





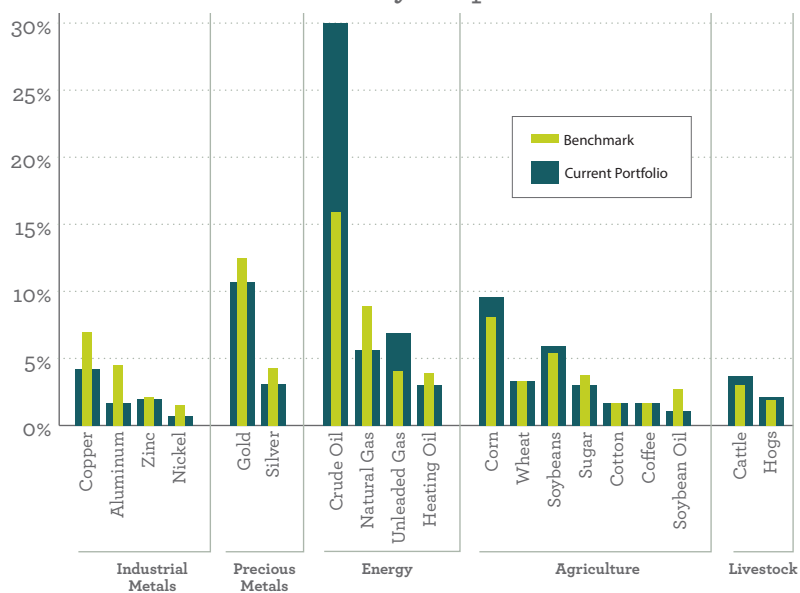
# Inflation Linked Bonds & Natural Resources

As of September 30, 2015

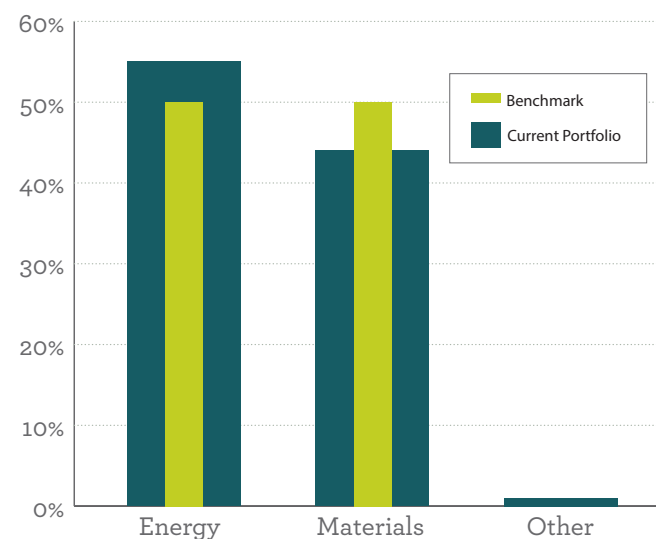
Strategy	Market Value	Portfolio Weight	Target Weight	Standard Deviation	Sharpe Ratio	Benchmark	
						Beta <sup>1</sup>	Correlation <sup>1</sup>
<b>ILB</b>	<b>\$23,598,000</b>	<b>0.7%</b>	<b>3.0%</b>	<b>8.8%</b>	<b>-0.6</b>	<b>1.3</b>	<b>0.9</b>
<i>BC Global ILB</i>				<i>5.9%</i>	<i>0.0</i>	-	-
<b>Natural Resources</b>	<b>\$124,072,655</b>	<b>3.5%</b>	<b>7.0%</b>	<b>14.8%</b>	<b>-0.9</b>	<b>1.0</b>	<b>0.9</b>
<i>Natural Resources Blend</i>				<i>11.8%</i>	<i>-1.1</i>	-	-
<b>Commodity</b>	<b>85,935,545</b>	<b>2.4%</b>	<b>5.0%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<i>BCOM</i>				<i>12.3%</i>	<i>-1.3</i>	-	-
<b>Resource Securities - Public</b>	<b>35,119,682</b>	<b>1.0%</b>	<b>2.0%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<i>MSCI 50/50 Materials &amp; Energy Blend</i>				<i>14.0%</i>	<i>-0.6</i>	-	-
<b>Resource Securities - Private</b>	<b>3,017,428</b>	<b>0.1%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total</b>	<b>\$147,670,655</b>	<b>4.2%</b>					

<sup>1</sup> Beta & Correlation are relative to each item's respective benchmark.

## Commodity Exposure



## Resource Securities Public Exposure



# All Asset Strategies

As of September 30, 2015

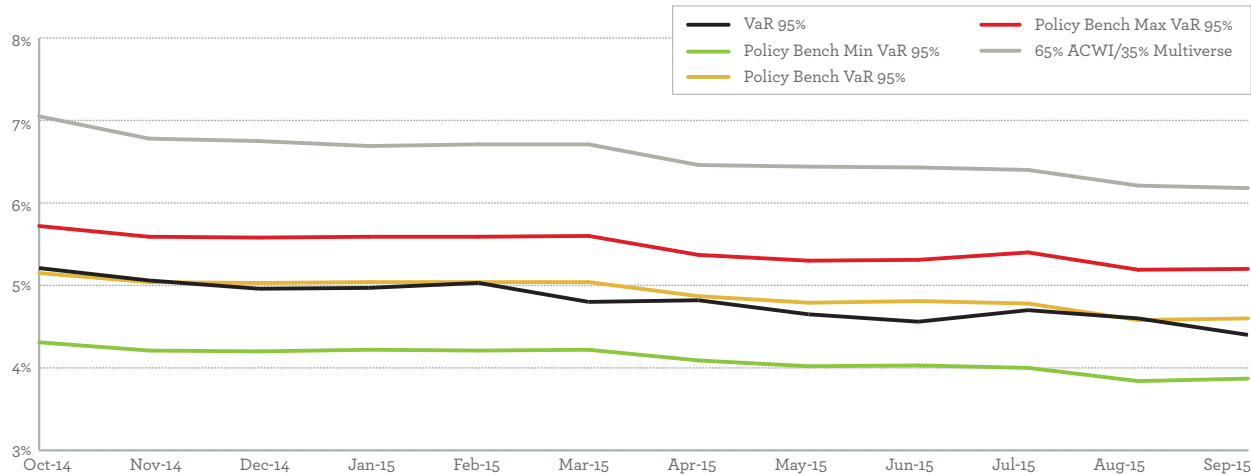
Strategy	Market Value	Portfolio Weight	Standard Deviation <sup>1</sup>	Sharpe Ratio <sup>1</sup>	Downside Deviation <sup>1</sup>	Max Drawdown <sup>1</sup>	% Positive Months <sup>1</sup>	Total Policy Benchmark	
								Beta <sup>1</sup>	Correlation <sup>1</sup>
Risk Parity	\$32,229,215	0.9%	8.0%	-0.1	9.4%	-10.9%	52.8%	1.4	0.6
Tactical Asset Allocation	28,271,350	0.8%	7.0%	-0.9	8.8%	-20.1%	47.2%	1.5	0.7
<b>All Asset Total</b>	<b>\$60,500,565</b>	<b>1.7%</b>	<b>7.5%</b>	<b>-0.5</b>	<b>9.2%</b>	<b>-15.7%</b>	<b>50.0%</b>	<b>1.5</b>	<b>0.7</b>
<i>TTSTC Endowment</i>			4.0%	1.3	4.6%	-4.7%	72.2%	1.0	0.9

<sup>1</sup> Trailing 36 months.

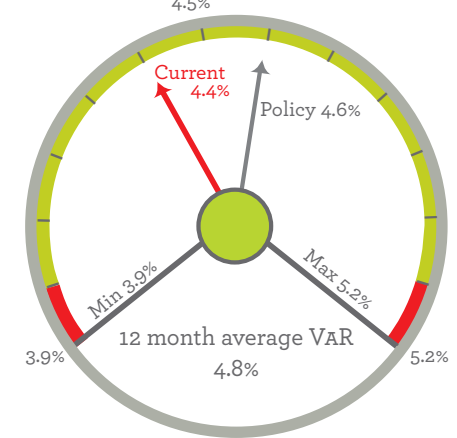
# Value at Risk (VaR) Analysis

As of September 30, 2015

## Twelve Month History

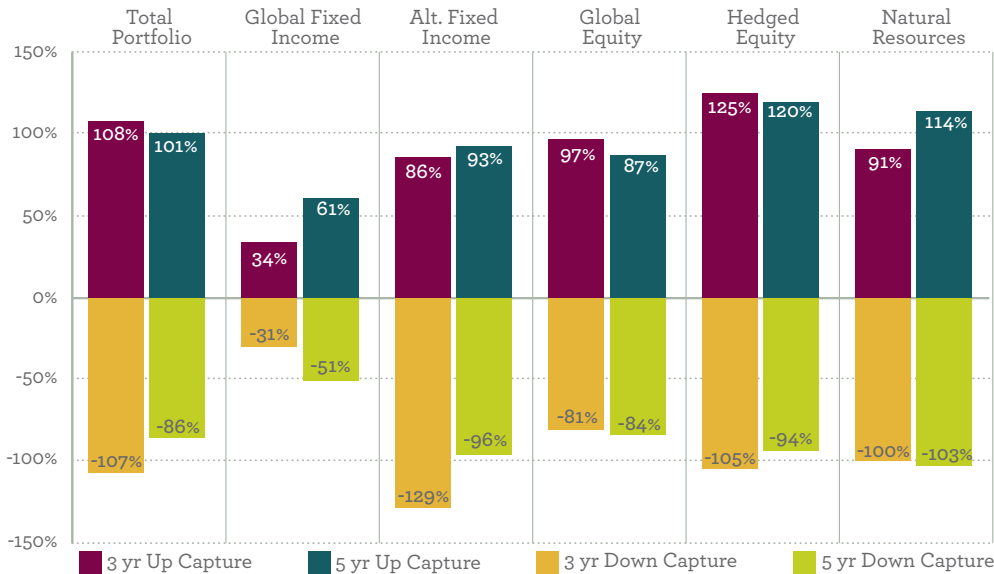


## VaR as a Percent of Market Value<sup>1</sup> (One Month, 95% Confidence)



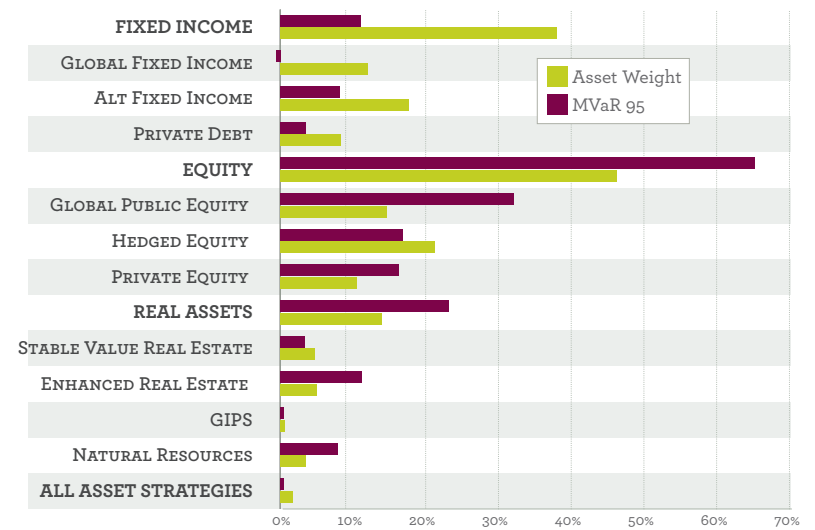
<sup>1</sup> Due to a material reduction in measured portfolio VaR in September that was not accompanied with a corresponding reduction in measured policy benchmark VaR, portfolio VaR in calculated using a more conservative method (parametric method instead of the usual historical method). Regardless of the method utilized, either calculation would result in portfolio VaR that is in compliance.

## Up and Down Capture<sup>1</sup>



<sup>1</sup> Up and down capture are relative to their respective benchmarks

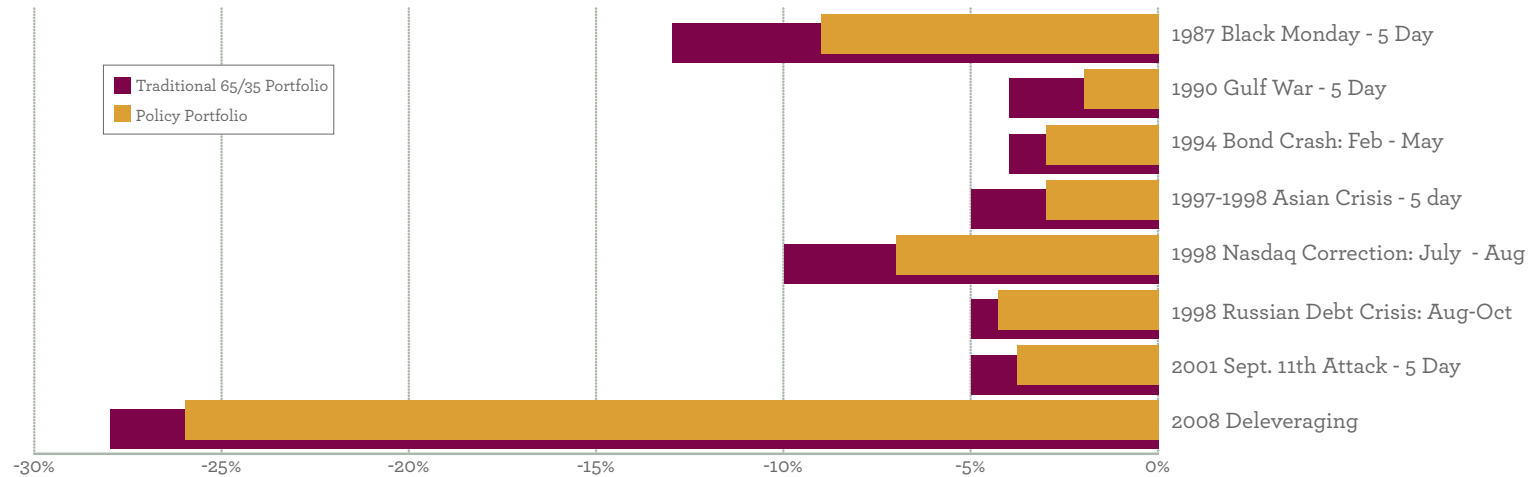
## VaR Contribution



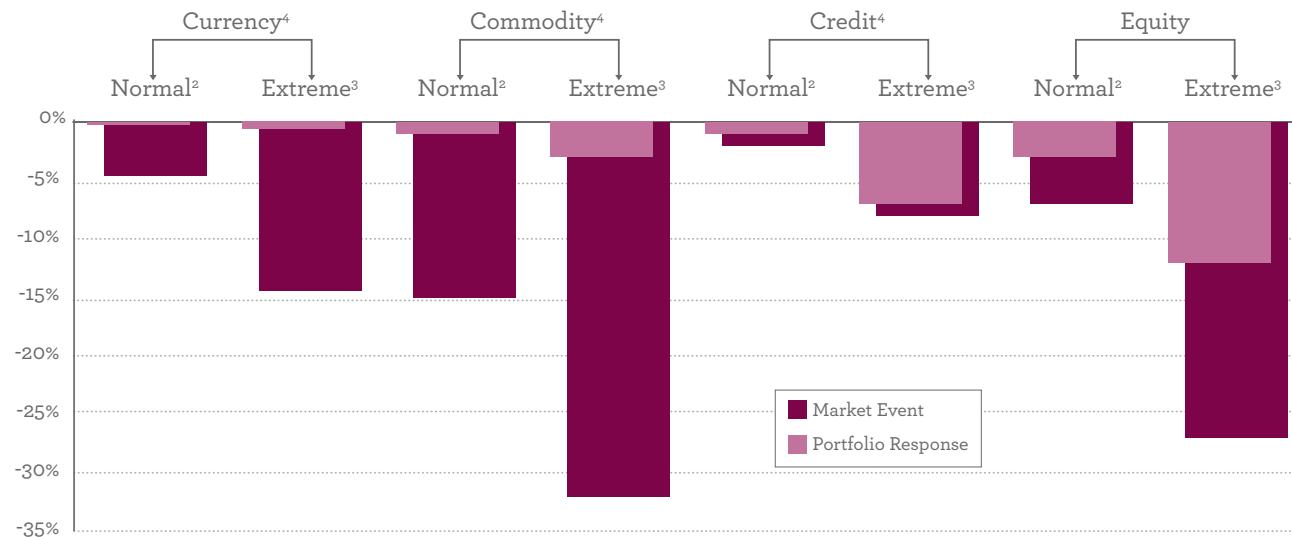
# Portfolio Stress Tests<sup>1</sup>

As of September 30, 2015

## Performance In a Crisis Relative to Policy Portfolio with Absolute Numbers



## Portfolio Tail Risk Profile



<sup>1</sup> Data sourced from State Street TrueView

<sup>2</sup> Normal Scenarios - 16% Probability

<sup>3</sup> Extreme Scenarios - 1% Probability

<sup>4</sup> Factors have lower confidence level and are less reliable.

# TTSTC Performance Table

*As of September 30, 2015*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
<b>2002</b>	-0.8%	-0.1%	1.9%	-1.8%	-0.6%	-4.6%	-4.7%	0.7%	-6.0%	3.7%	4.0%	-2.8%	<b>-11.0%</b>
<b>2003</b>	-1.6%	-0.9%	0.4%	5.9%	4.8%	1.3%	1.4%	2.1%	0.3%	4.4%	1.6%	3.6%	<b>25.6%</b>
<b>2004</b>	2.0%	1.4%	0.1%	-2.4%	0.8%	2.1%	-2.8%	0.6%	2.2%	1.6%	4.1%	2.9%	<b>13.0%</b>
<b>2005</b>	-1.7%	2.0%	-1.6%	-2.1%	2.9%	1.3%	3.2%	0.2%	1.2%	-1.9%	2.8%	1.4%	<b>7.7%</b>
<b>2006</b>	3.8%	0.0%	1.8%	1.5%	-2.5%	-0.2%	0.2%	1.8%	1.2%	2.8%	2.2%	1.3%	<b>14.7%</b>
<b>2007</b>	1.2%	-0.1%	1.4%	3.0%	2.7%	-0.7%	-1.7%	0.3%	3.0%	2.0%	-3.2%	-0.2%	<b>7.7%</b>
<b>2008</b>	-4.2%	-0.5%	-1.1%	2.3%	1.3%	-3.4%	-1.2%	-0.8%	-6.7%	-9.6%	-2.9%	0.6%	<b>-23.8%</b>
<b>2009</b>	-2.0%	-3.6%	1.9%	3.2%	3.1%	0.5%	4.0%	1.3%	2.5%	0.1%	2.2%	1.1%	<b>14.9%</b>
<b>2010</b>	-1.0%	1.0%	2.6%	1.0%	-3.9%	-1.1%	3.4%	-0.7%	4.1%	2.1%	-0.4%	3.0%	<b>10.3%</b>
<b>2011</b>	0.7%	1.6%	0.6%	2.2%	-0.5%	-1.1%	0.1%	-2.2%	-4.4%	3.1%	-0.8%	-0.5%	<b>-1.6%</b>
<b>2012</b>	2.3%	2.0%	0.0%	0.2%	-2.8%	1.1%	1.3%	1.6%	1.4%	0.1%	0.9%	0.9%	<b>9.3%</b>
<b>2013</b>	2.1%	0.2%	1.1%	1.0%	0.1%	-2.1%	1.9%	0.0%	1.8%	1.9%	0.8%	0.6%	<b>9.8%</b>
<b>2014</b>	-0.1%	2.5%	0.2%	0.6%	1.3%	1.1%	-0.3%	0.9%	-1.5%	0.0%	1.0%	-0.8%	<b>4.9%</b>
<b>2015</b>	0.2%	2.1%	-0.2%	1.4%	0.4%	-1.1%	0.1%	-2.1%	-1.8%				<b>-1.0%</b>



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