



Inflation Portfolio Overview

03/29/2017



North Carolina Department of State Treasurer
Investment Management

Learn. Invest. Grow. Prosper.

Team Introduction

Ronald Funderburk, CFA

Director

8 years with IMD

12 Years Industry Experience

Kathy Hahn, CFA

Assistant Director

6 years with IMD

13 Years Industry Experience

John Leraas

Portfolio Manager

1.5 years with IMD

9 Years Industry Experience

Zhexing Zhang

Quantitative Analyst

2.5 years with IMD

3 Years Industry Experience



Portfolio Goal

Investment Policy Statement (“IPS”) states top five objectives of the Inflation Sensitive Portfolio as:

1. Inflation protection: Provide some degree of protection against the risks associated with inflation
2. Attractive absolute returns: Provide an attractive return over the long-term by making investments that provide a nominal total return that rises with inflation
3. Competitive relative returns: Achieve or exceed the return on the performance benchmark over a long period of time, within reasonable risk parameters
4. Diversification: Enhance the diversification of the Fund’s total investment portfolio relative to public equity and nominal fixed income.
5. Liquidity: Provide a source of liquidity to the Fund when other Portfolios are experiencing lower returns due to unanticipated inflation.



Policy Subcomponents and Strategies

Policy Subcomponents

Inflation Linked Bonds

Publicly Traded Natural Resources

Private Natural Resources

Other Real Assets & Diversifiers

Potential Strategies

TIPS

Proxies to TIPS

Commodity Futures

Natural Resources
Public Equity

Natural Resources
Public Debt

Oil & Gas PE

Metals & Mining PE

Natural Resources
Lending

Timber

Agriculture

Infrastructure

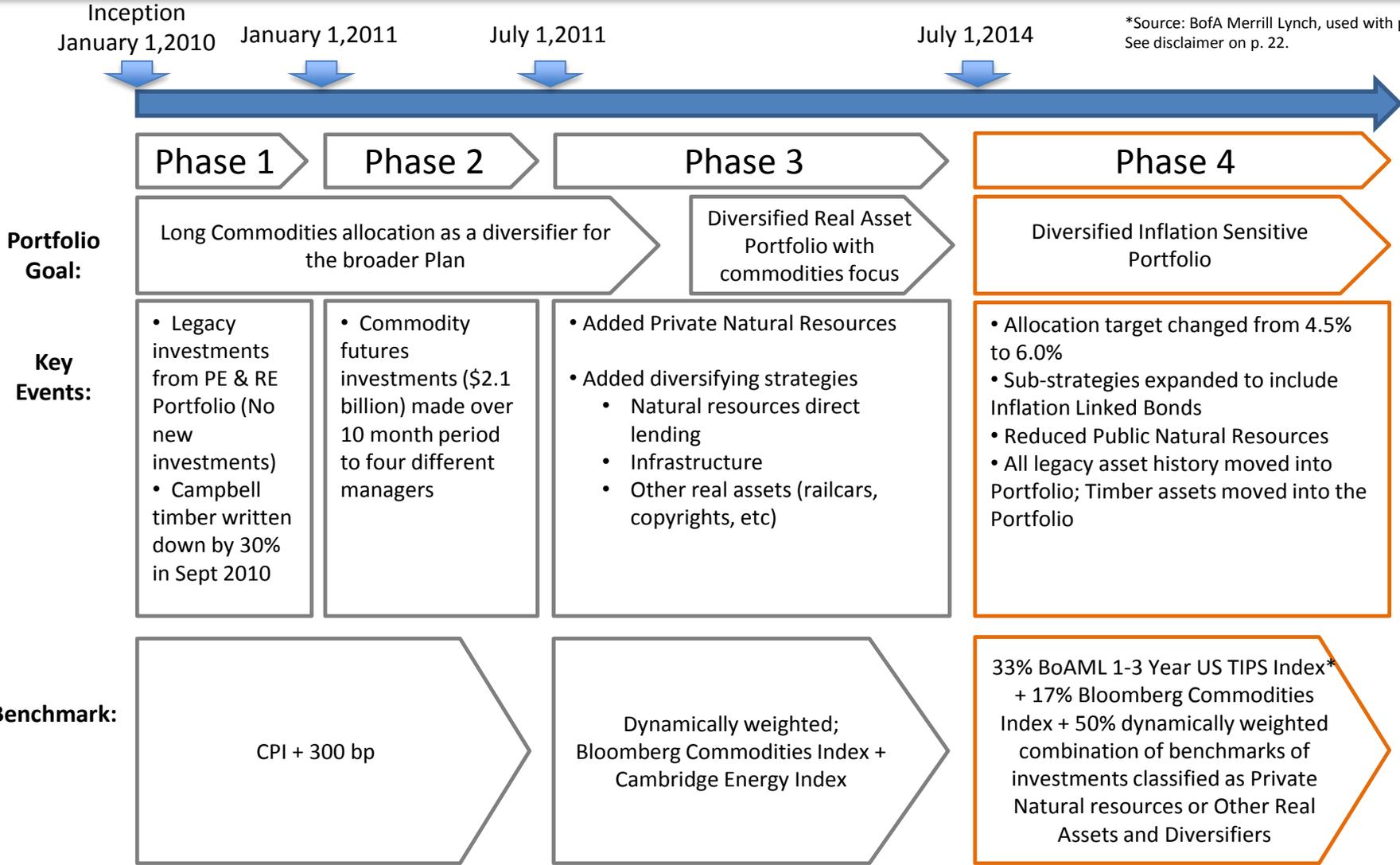
Real Assets

Secondaries

Real Asset Lending



Portfolio History



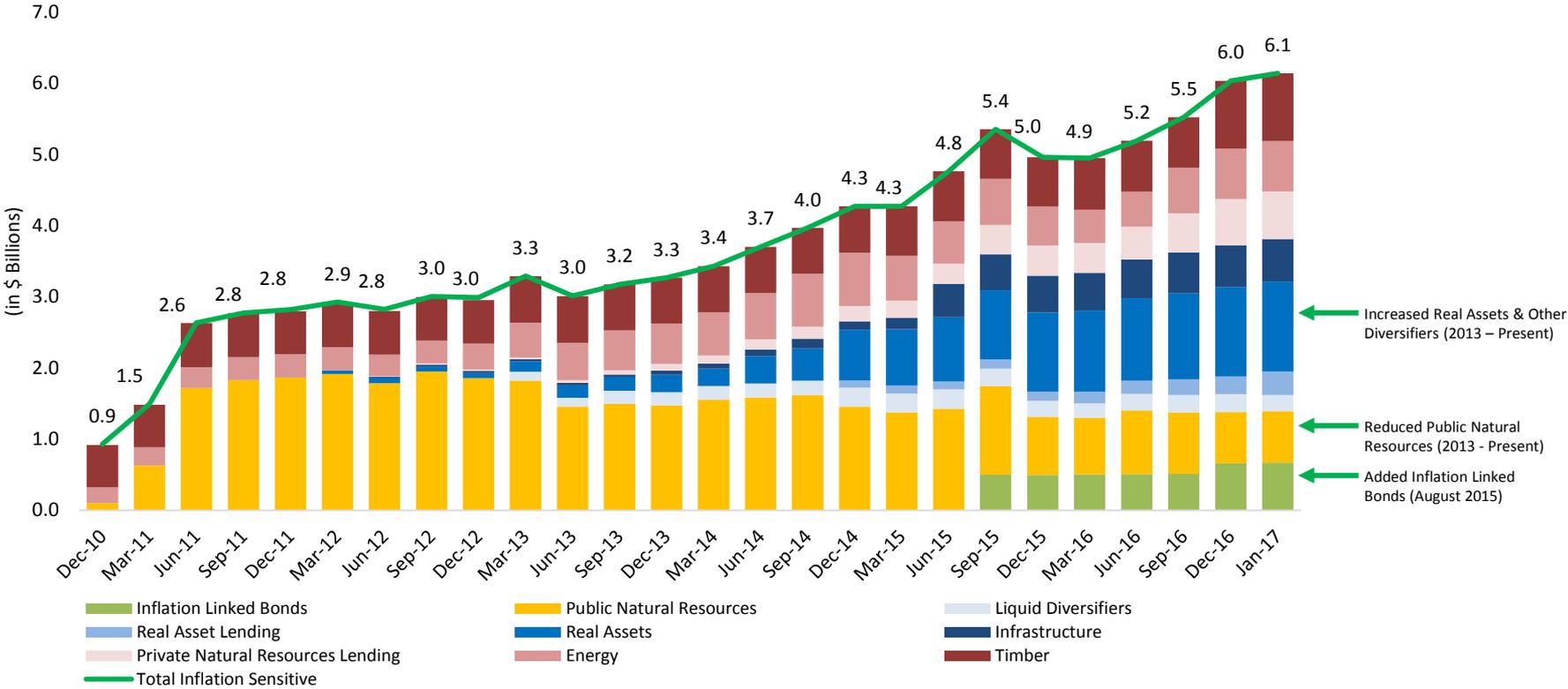
*Source: BofA Merrill Lynch, used with permission. See disclaimer on p. 22.



Portfolio History

*Data as of 1/31/2017

Historical Allocation by Strategy



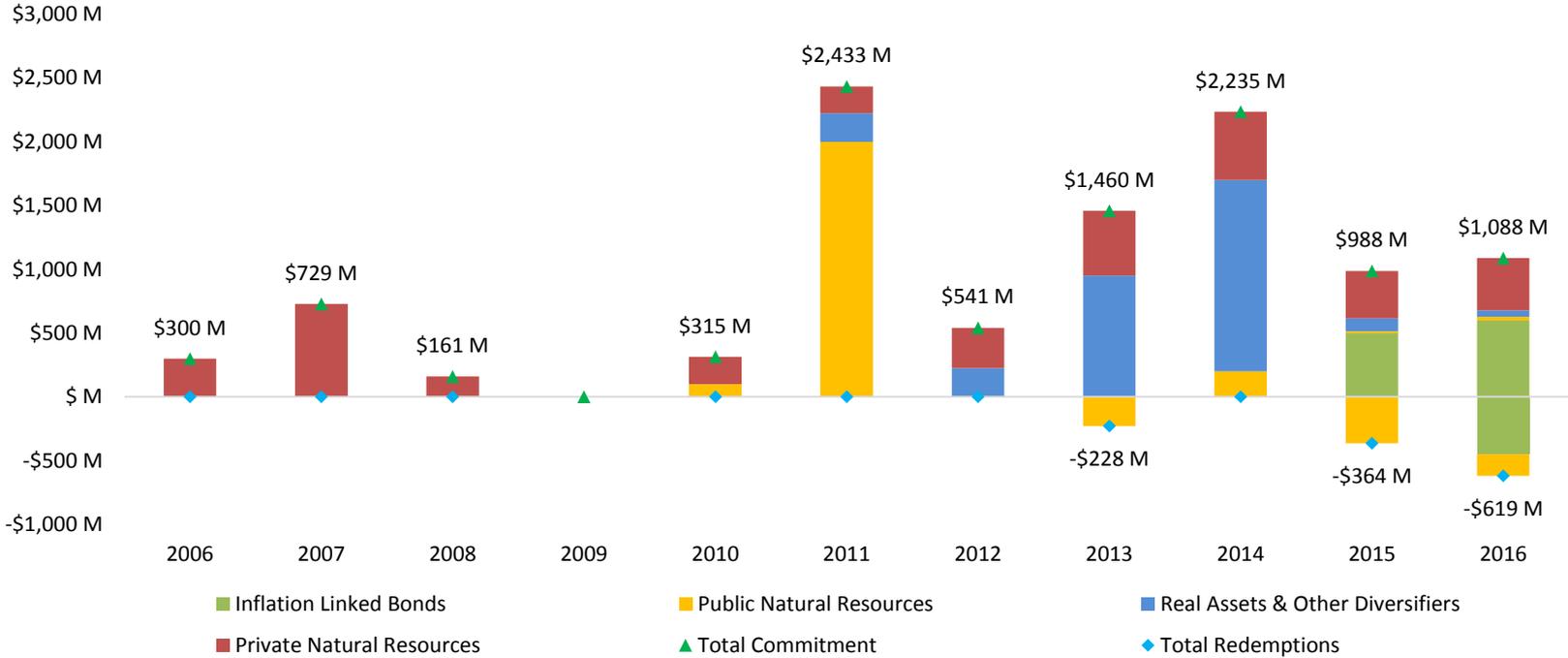
- Inflation Sensitive Portfolio diversification has expanded substantially
- 25 Managers and 49 Funds / Co-Investments



Portfolio History (contd.)

*Data as of 1/31/2017

Historical Commitment by Strategy



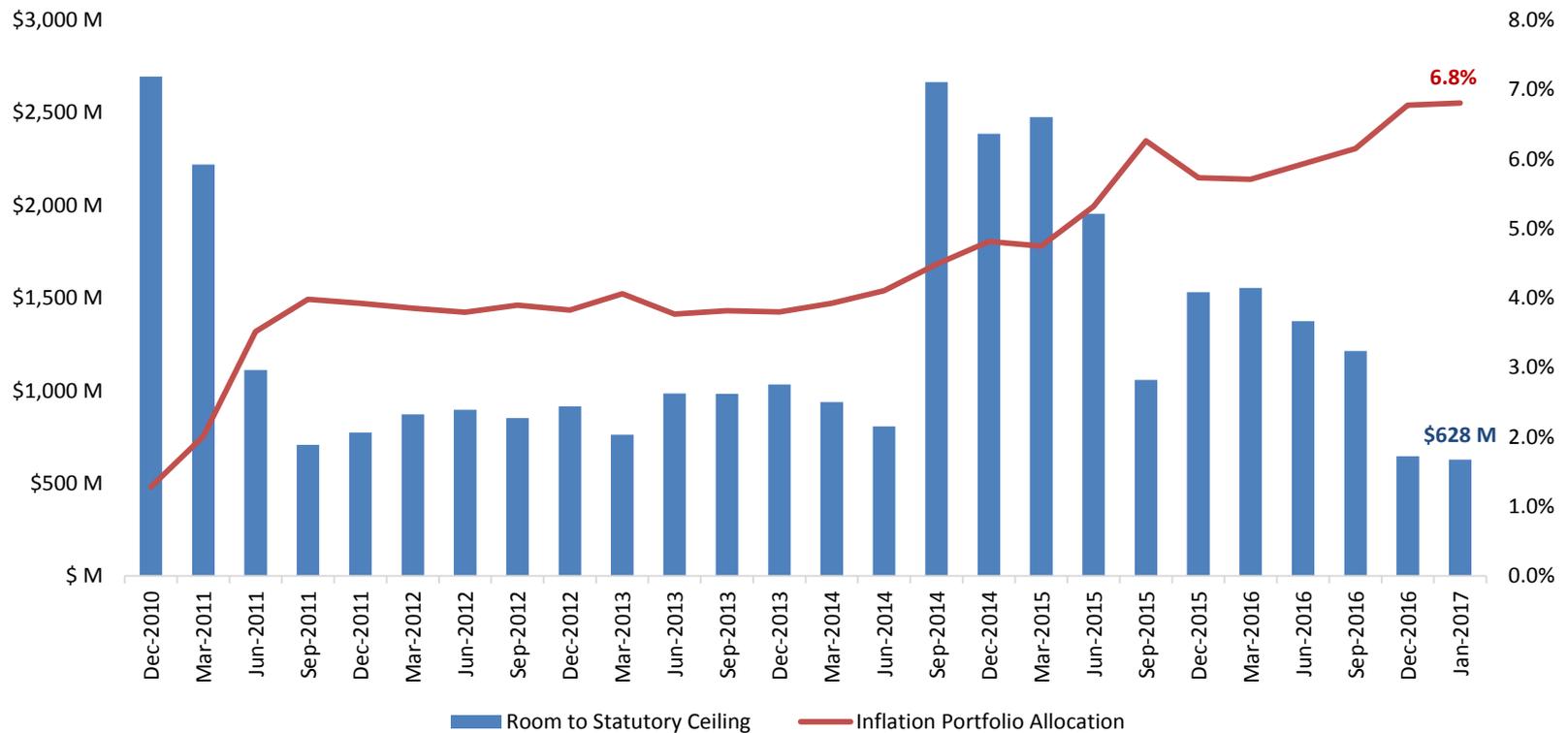
- Increased Real Assets & Other Diversifiers in 2013, 2014
- Added Inflation Linked Bonds in 2015, 2016



Room to Statutory Ceiling

* Data as of 1/31/2017

Historical Inflation Portfolio Allocation



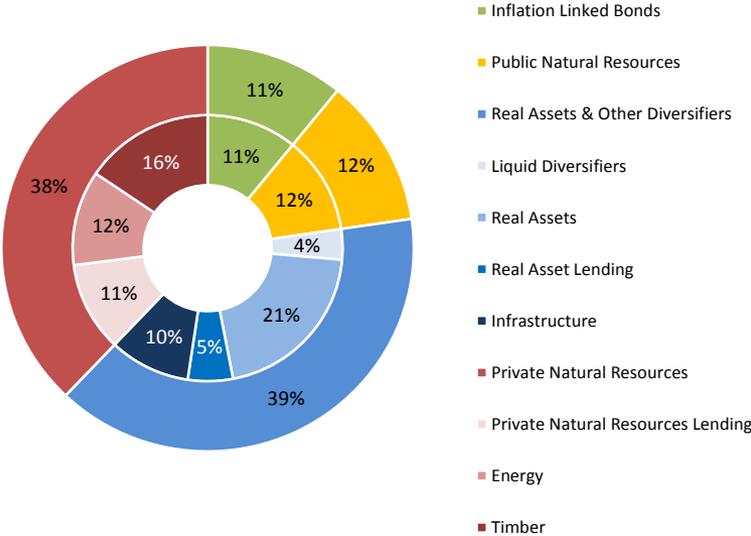
- Statutory Maximum changed in 2014 from 5% of plan assets to 7.5%



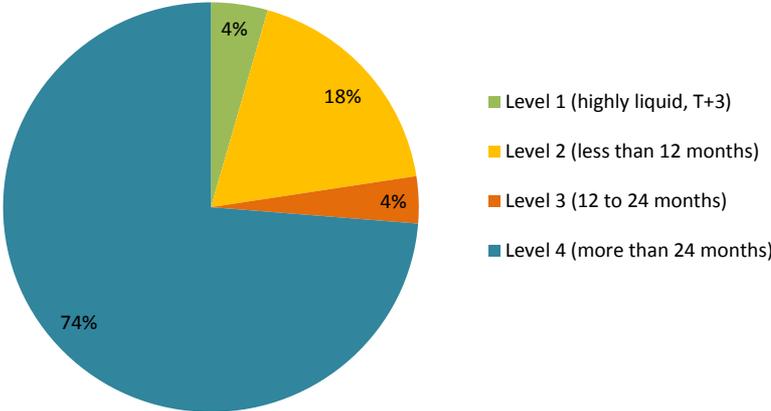
Portfolio Characteristics

* Data as of 1/31/2017

Current Allocation by Strategy



Portfolio Liquidity¹



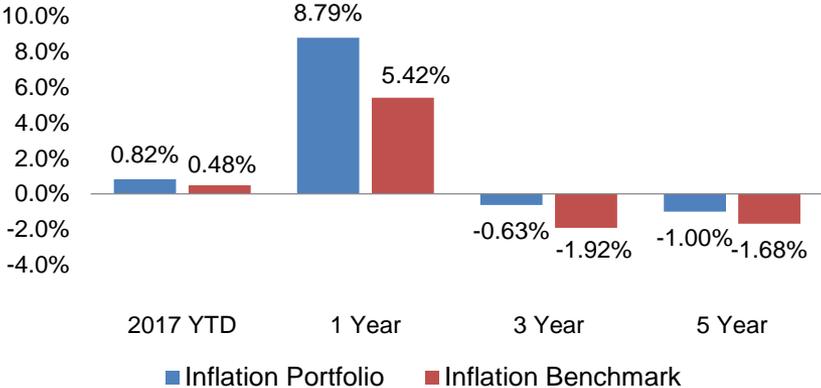
¹ DST internal liquidity profile



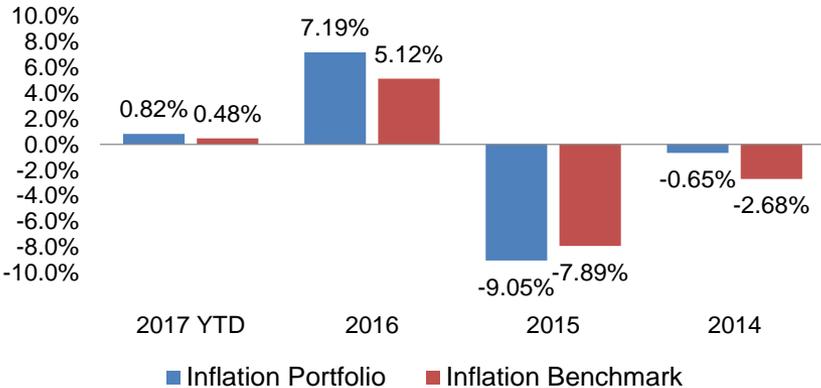
Portfolio Performance

* Data as of 1/31/2017 (quarterly)

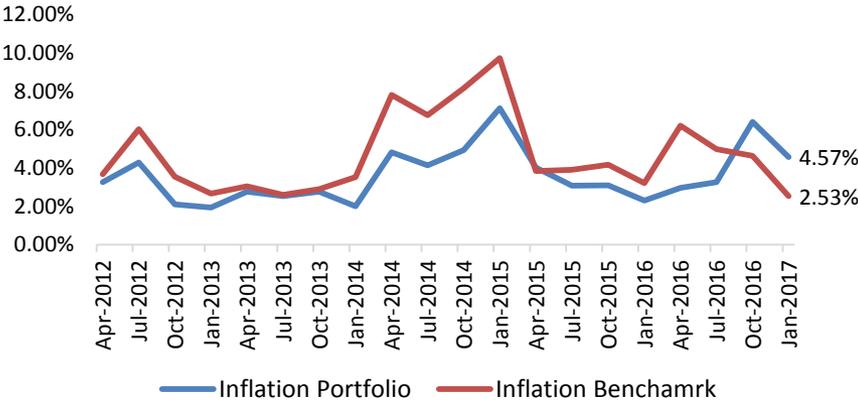
Annualized Performance



Calendar Year Performance



Rolling 1-Year Volatility



5-Year Correlation

	IS	Total Plan	GPE	PE	NCRE	IG FI	Opp FI	CRE	Multi
IS	1.00								
Total Plan	0.37	1.00							
GPE	0.33	0.94	1.00						
PE	0.30	0.30	0.30	1.00					
NCRE	-0.06	0.16	0.15	0.66	1.00				
IG FI	-0.12	0.14	-0.16	-0.22	-0.04	1.00			
Opp FI	0.51	0.58	0.62	0.22	-0.16	-0.31	1.00		
CRE	-0.03	0.58	0.46	0.03	0.11	0.36	0.25	1.00	
Multi	0.29	0.93	0.98	0.31	0.11	-0.17	0.66	0.51	1.00



Current Inflation Environment

* Data as of 1/31/2017

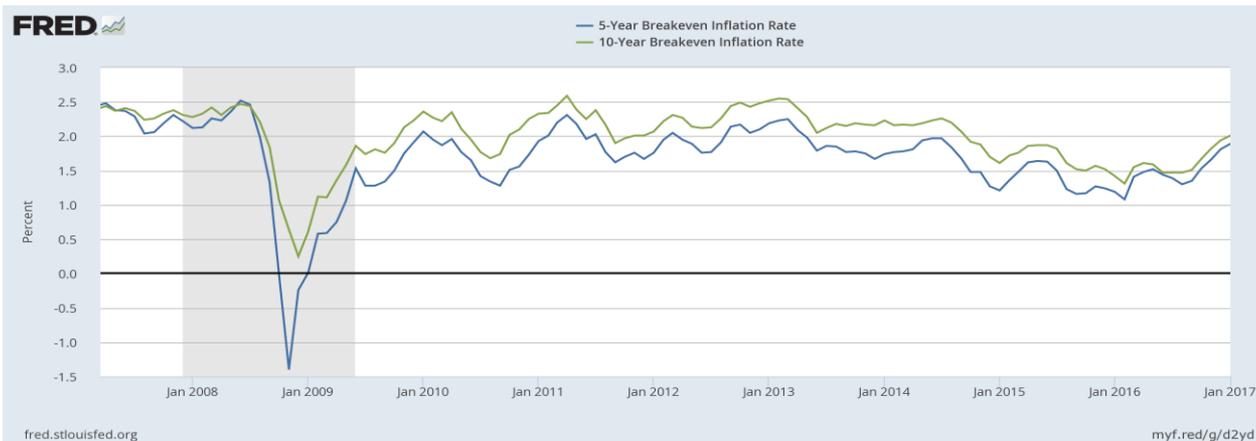
Year-over-Year CPI:



1960s to Present		
	CPI	Core CPI
Average	3.84%	3.83%
Median	3.12%	2.96%
Stev.	2.88%	2.60%

Last 10 Years		
	CPI	Core CPI
Average	1.78%	1.86%
Median	1.69%	1.90%
Stev	1.45%	0.43%
YoY, Jan 2017	2.54%	2.26%

Monthly Breakeven Inflation Rate:



Last 10 Years		
	10-Yr Breakeven	5-Yr Breakeven
Average	2.01%	1.70%
Median	2.15%	1.77%
Stev.	0.42%	0.56%
1/31/2017	2.05%	1.94%



Performance of Key Indices

*Data as of 1/31/2017
Source: Bloomberg

Performance	2013	2014	2015	2016
Inflation Sensitive Portfolio	-1.32%	-0.65%	-9.05%	7.19%
Bloomberg Commodity Index Return	-9.52%	-17.01%	-24.66%	11.77%
BofA Merrill Lynch 1-3 Yr TIPS Index Return	-0.98%	-1.30%	-0.43%	2.55%
S&P 500 - Energy	25.07%	-7.78%	-21.12%	27.36%
BofA ML IG Energy Index	-3.05%	4.78%	-5.67%	11.58%
BofA ML IG Metals Mining and Steel Index	-4.31%	6.71%	-13.61%	21.68%

- Inflation Portfolio continued to diversify away from Public Natural Resources and energy related investments consistent with having a balanced portfolio
- The increased diversification has benefited 3-year and 5-year performance



Recent Accomplishments

	Accomplishments	Better Economics	Better Governance	Customized Exposure	Diligence Resources
1	Timber Restructuring	✓	✓		
2	Customized Inflation Linked Bonds	✓		✓	
3	Fund of One Relationships	✓	✓	✓	
4	Cross Asset Class Collaboration	✓	✓	✓	✓



Current Priorities

Priorities

- 1 Manage Portfolio Weight vs. Statutory Limit and Plan Target
- 2 Researching the Current and Evolving Drivers of Inflation



Strategic Considerations for Discussion

1. Discuss relative importance of vintage diversification
2. Discuss overall inflation outlook and drivers
3. Discuss overall importance of policy subcomponents and major sub strategies



Supplemental Information for Discussion



Inflation Portfolio IRR by Vintage

* Data as of 1/31/2017

Vintage	Inflation Linked Bonds	Public Traded Natural Resources	Private Natural Resources	Real Assets & Other Diversifiers	All
2016	2.56	-	-	-	2.56
2015	1.10	-	9.62	10.46	3.57
2014	-	-3.75	9.50	10.27	7.07
2013	-	-	5.11	4.34	4.51
2012	-	-	4.10	5.90	4.95
2011	-	-10.85	-1.17	7.84	-7.43
2010	-	-9.46	-2.49	-	-8.21
2008	-	-	1.48	-	1.48
2007	-	-	7.88	-	7.88
2006	-	-	-0.33	-	-0.33
1993	-	-	9.38	-	9.38
All	2.10	-9.78	1.24	6.82	-1.36

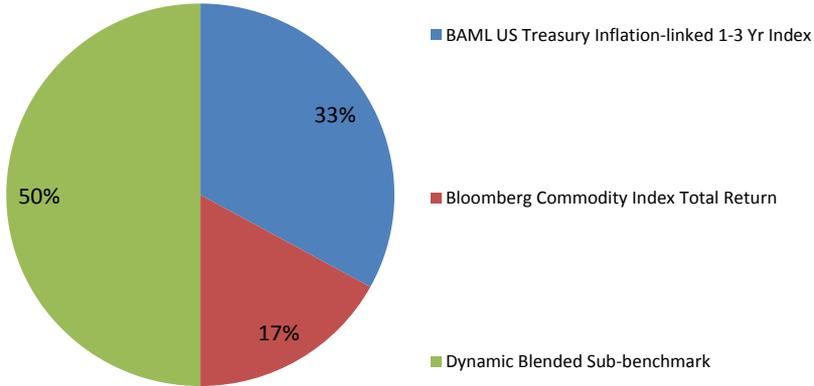
- Real Assets & Other Diversifiers have been a positive contributor to performance
- Recent Private Natural Resource commitments have demonstrated positive early performance
- Public Natural Resources have performed in line with relevant commodity benchmarks



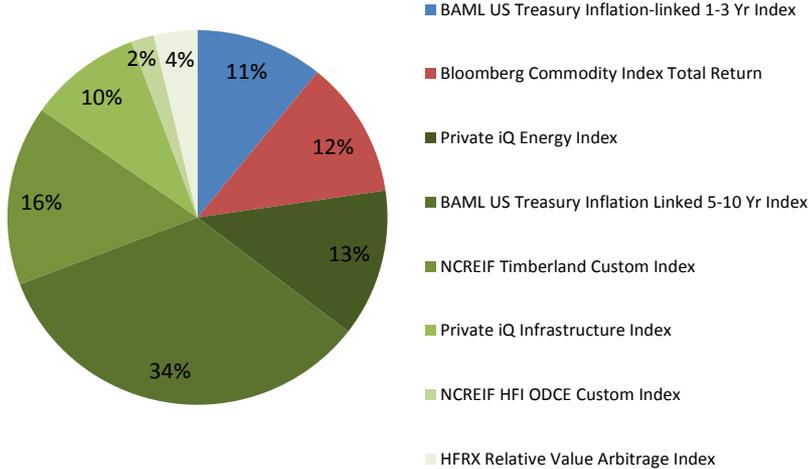
Benchmark Breakdown

* Data as of 1/31/2017

Long-Term Target Benchmark



Current Benchmark Component



The Inflation Sensitive Portfolio follows a dynamic benchmark, which is dictated by

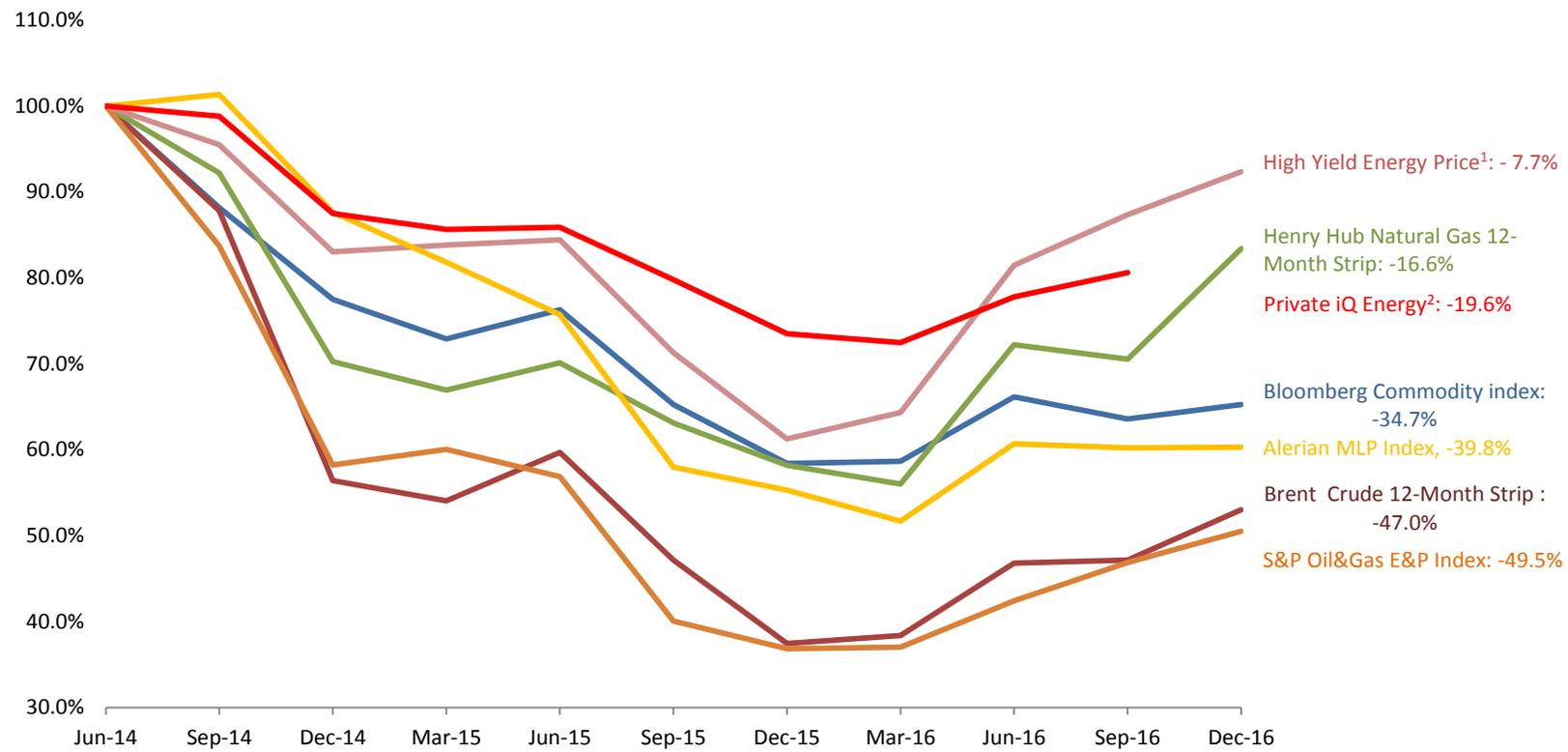
- (1) the market value of each investment and
- (2) the appropriate benchmark(s) for that investment.



Commodity Downturn & Recovery

* Data as of 12/31/2016

Price Movement Since 6/30/2014



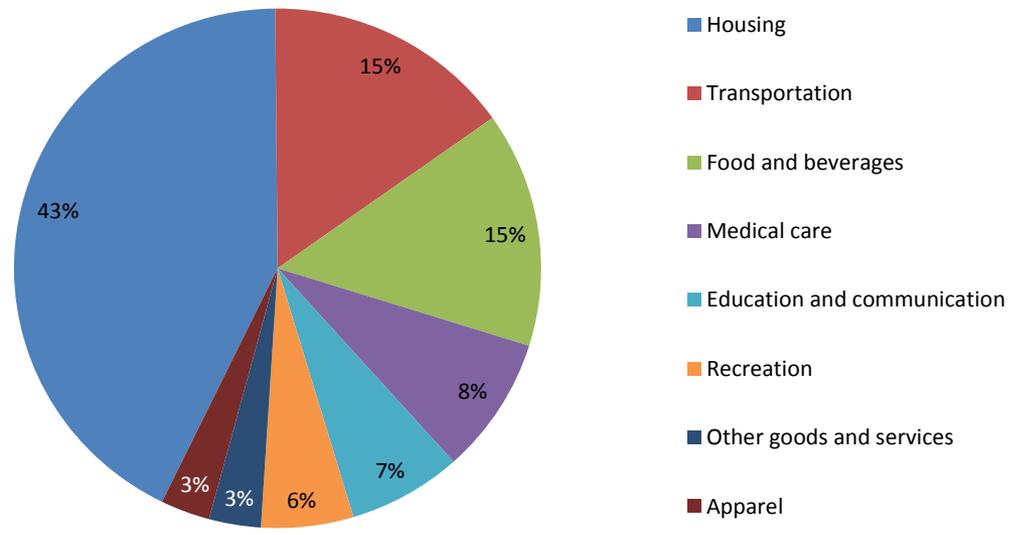
Source: Bloomberg. ⁽¹⁾ Source: BofA Merrill Lynch, used with permission. ⁽²⁾ Source: Burgiss Private iQ. See disclaimer on p. 22.



CPI Components

* Data as of 12/31/2016

CPI Component Weight

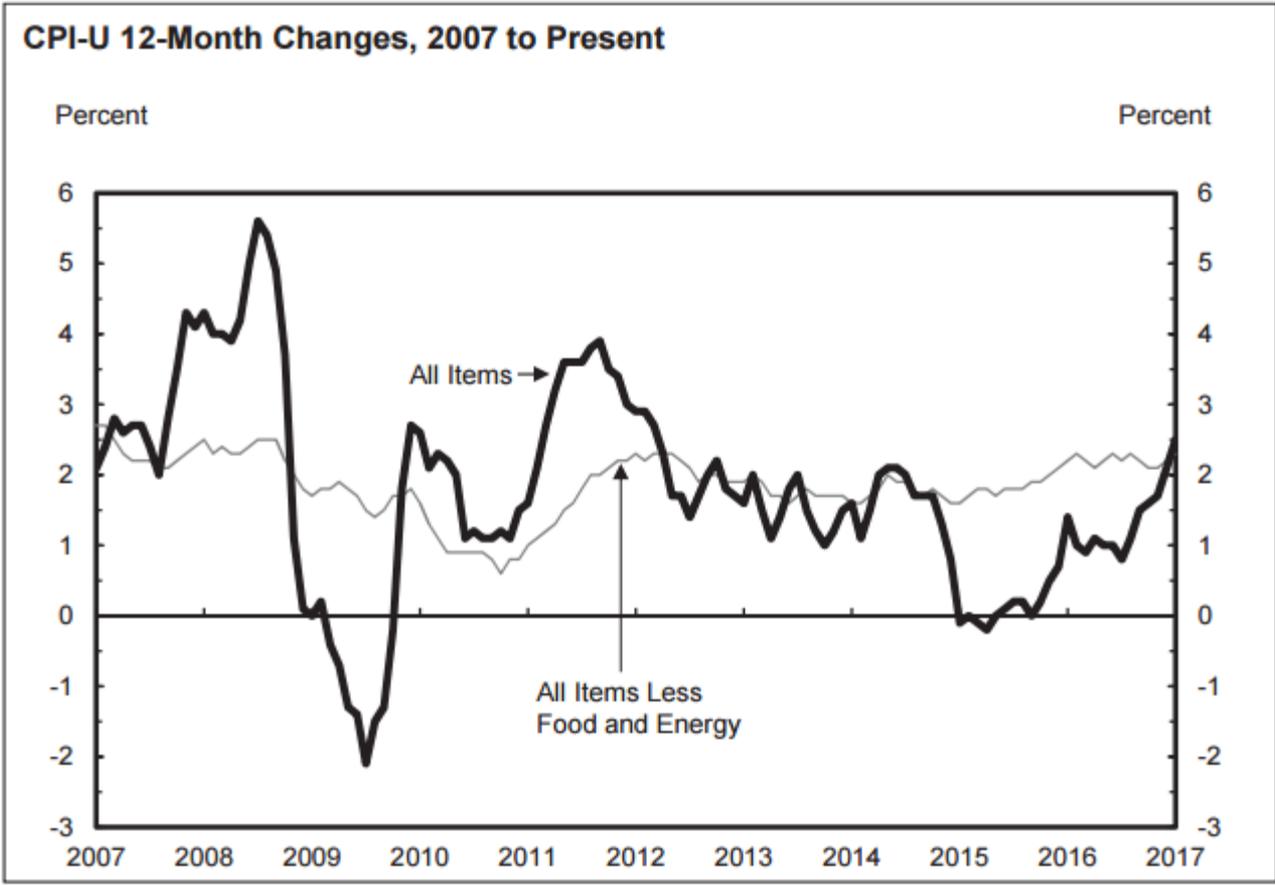


Source: The U.S. Bureau of Labor Statistics (BLS)



CPI: Annual CPI Change

* Data as of 1/31/2017



Source: The U.S. Bureau of Labor Statistics (BLS)



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