

NORTH CAROLINA
DEPARTMENT OF STATE TREASURER



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INVESTMENT MANAGEMENT DIVISION

Inflation Portfolio Review

February 22, 2023



Overview

- 1) Inflation strategy is performing as originally designed
- 2) Diversification has proven to be value added
- 3) Macroeconomic Environment is Uncertain



Role in the Portfolio

Inflation Protection

- Provide some degree of protection against the risks associated with inflation

Attractive Absolute Returns

- Provide an attractive return over the long-term by making investments that provide a nominal total return that rises with inflation

Competitive Relative Returns

- Achieve or exceed the return on the performance benchmark over a long period of time, within reasonable risk parameters

Diversification

- Enhance the diversification of the Fund's total investment portfolio relative to public equity and nominal fixed income

Liquidity

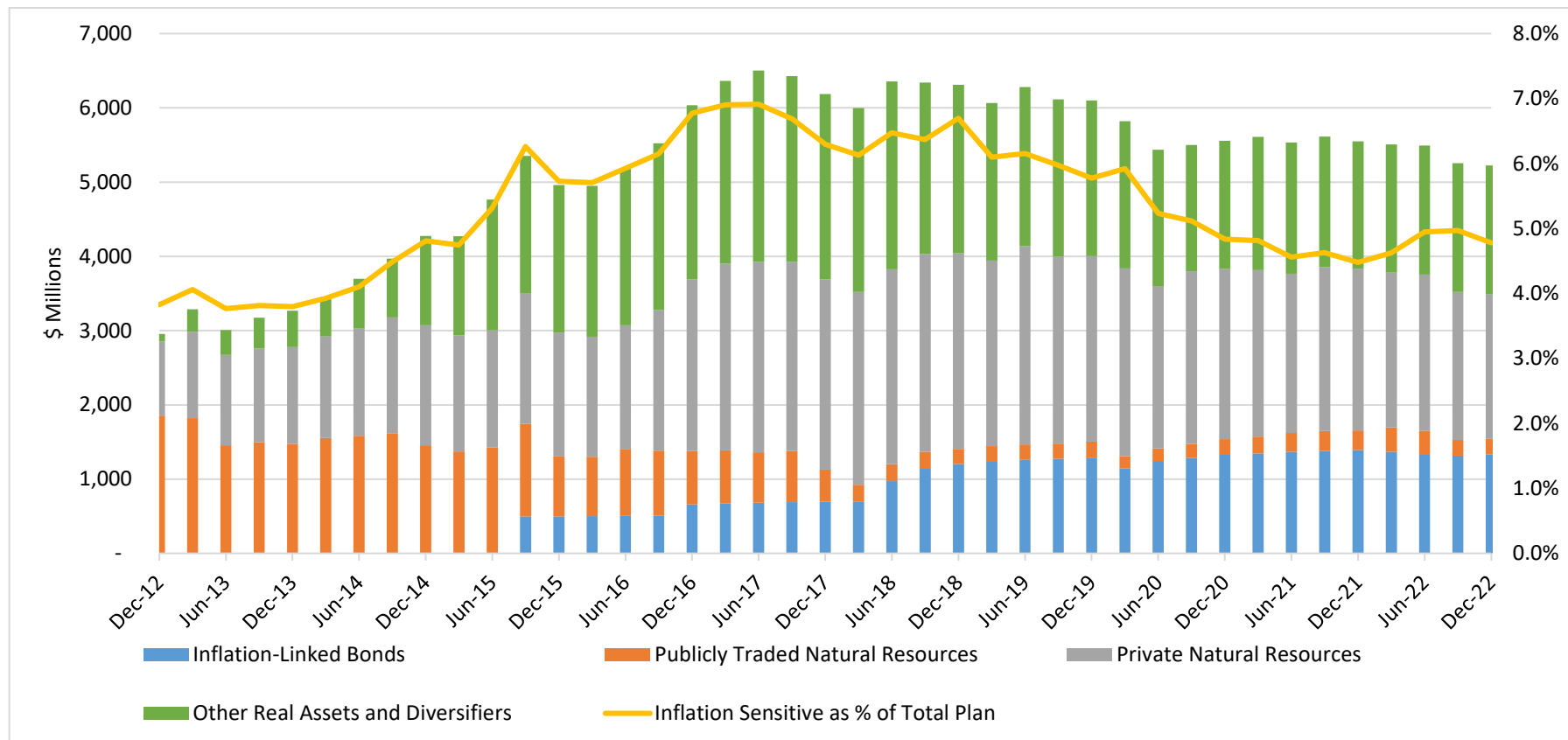
- Provide a source of liquidity to the Fund when other Portfolios are experiencing lower returns due to unanticipated inflation



Portfolio History

As of December 31, 2022

Historical Allocation by Sub-Strategy



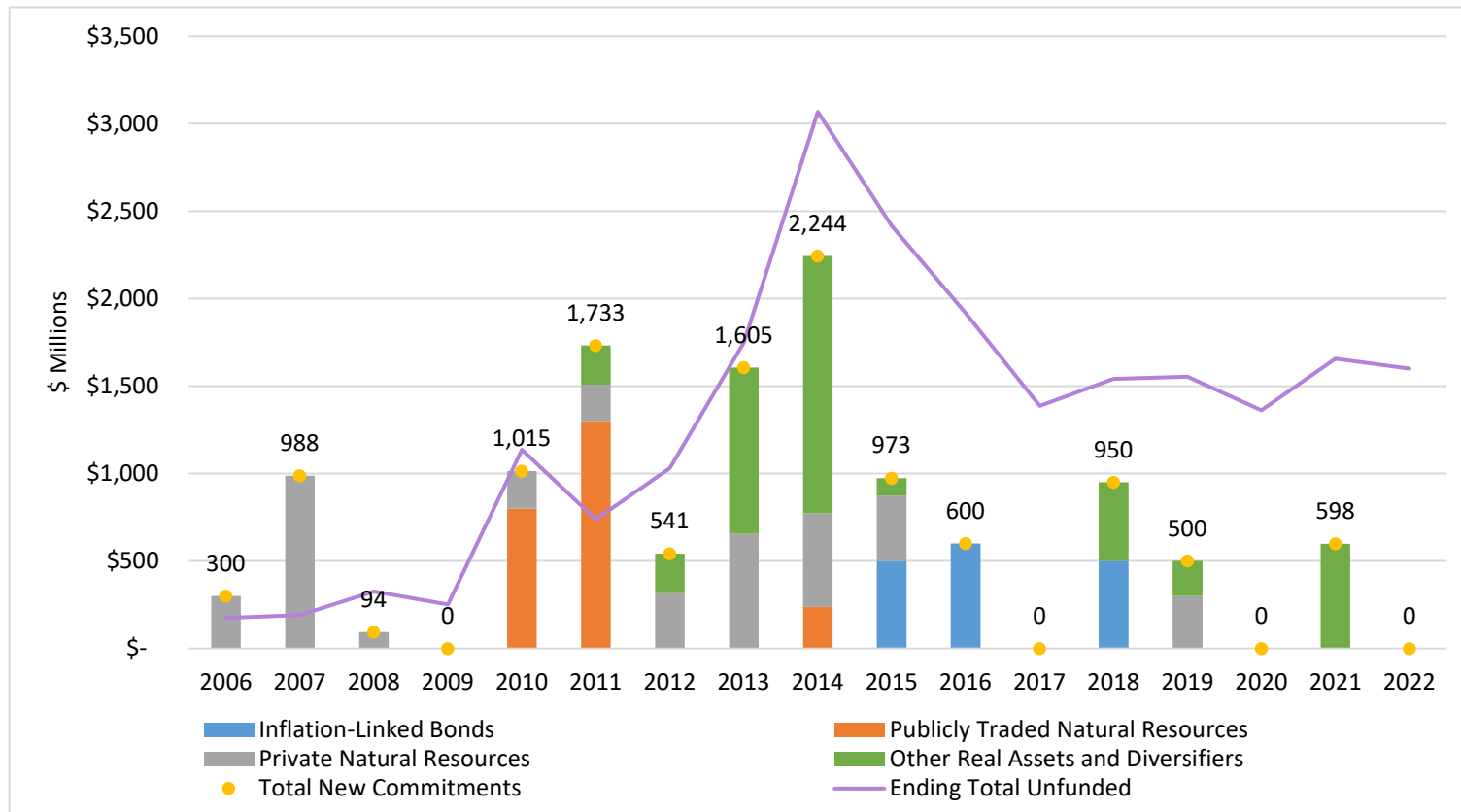
- Inflation Sensitive Portfolio diversification has expanded substantially



Portfolio History

As of December 31, 2022

Historical New Commitments by Component and Total Unfunded



Note: Unfunded values are as of each respective calendar year end



Current Portfolio Allocation

As of December 31, 2022

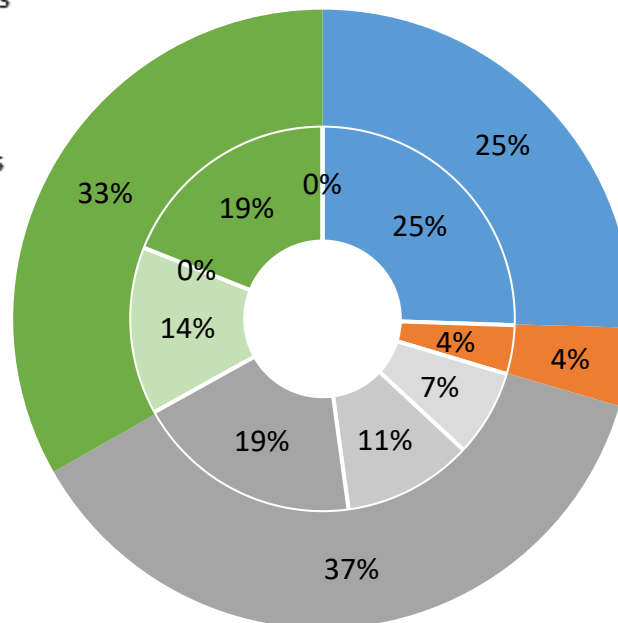
Allocation by Component and Sub-Strategy

Components (Outer):

- Inflation-Linked Bonds
- Publicly Traded Natural Resources
- Private Natural Resources
- Other Real Assets and Diversifiers

Sub-Strategies (Inner):

- Inflation-Linked Bonds
- Publicly Traded Natural Resources
- Energy
- Private Natural Resources Lending
- Timber
- Infrastructure
- Liquid Diversifiers
- Real Assets
- Real Asset Lending

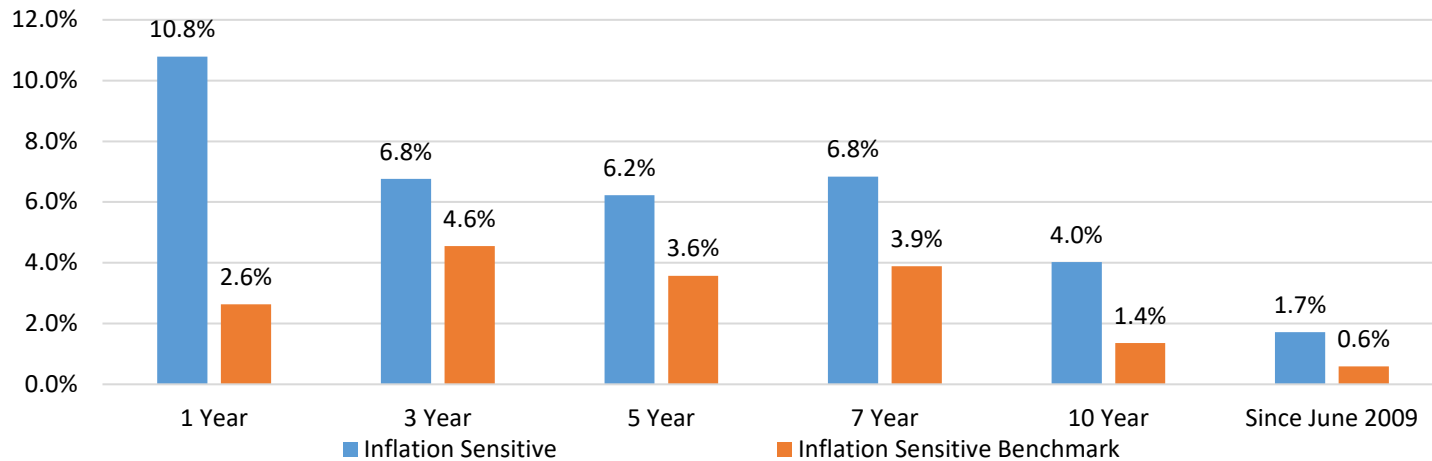




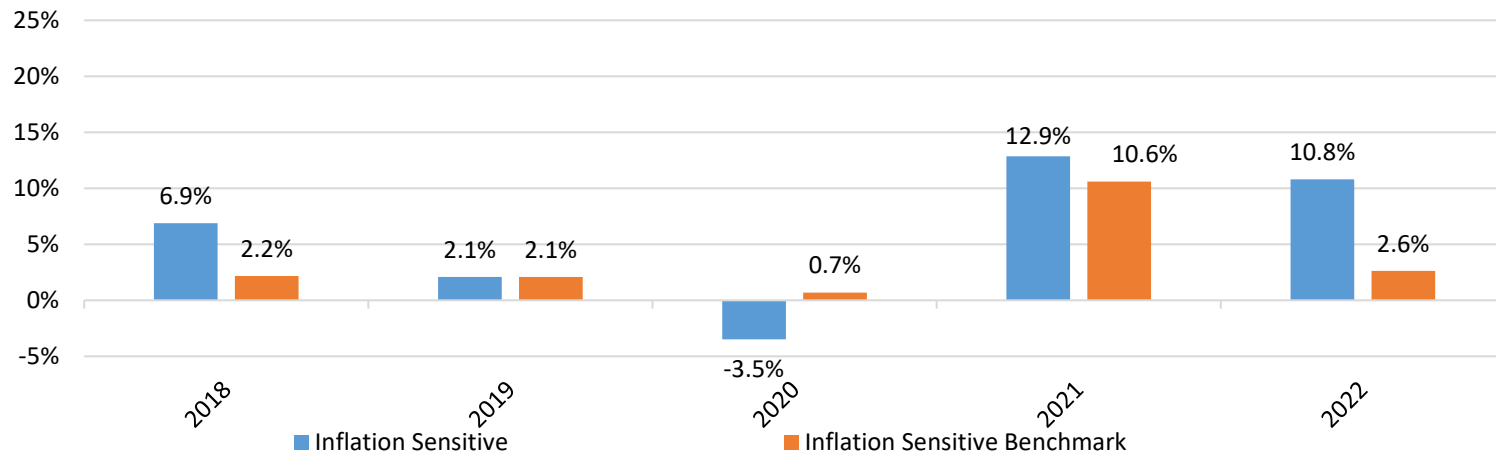
Portfolio Performance

As of December 31, 2022

Annualized Performance



Calendar Year Performance



Notes:

Periods greater than one year are annualized

See slides 10 and 27 for details on the composition of the Inflation Sensitive Benchmark



Portfolio Performance

As of December 31, 2022

Performance by Component



Notes:

Periods greater than one year are annualized (%)

See slides 10 and 27 for details on the composition of the Inflation Sensitive Benchmark

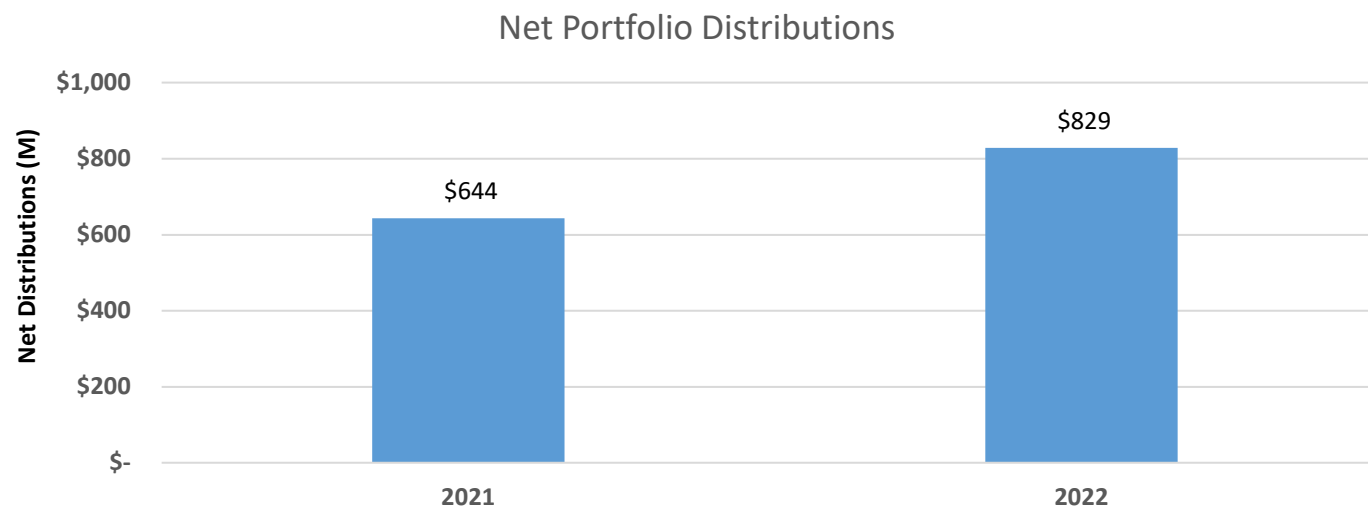


Portfolio Performance

As of December 31, 2022

Inflation Sensitive Portfolio Correlation

	Total Pension		Private	Non-Core	Opportunistic	Investment	Core Real	Multi-
	Plan	Public Equity	Equity	Real Estate	Fixed Income	Grade Fixed Income	Estate	Strategy
3 - Year Correlation	-0.022	-0.102	0.553	0.593	0.633	-0.534	0.766	0.355
5 - Year Correlation	-0.062	-0.124	0.560	0.533	0.633	-0.518	0.605	0.229

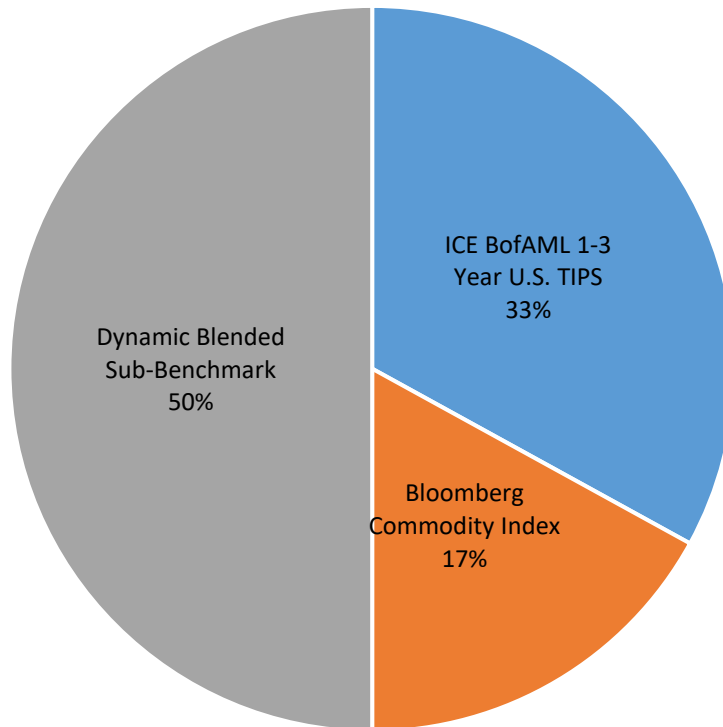




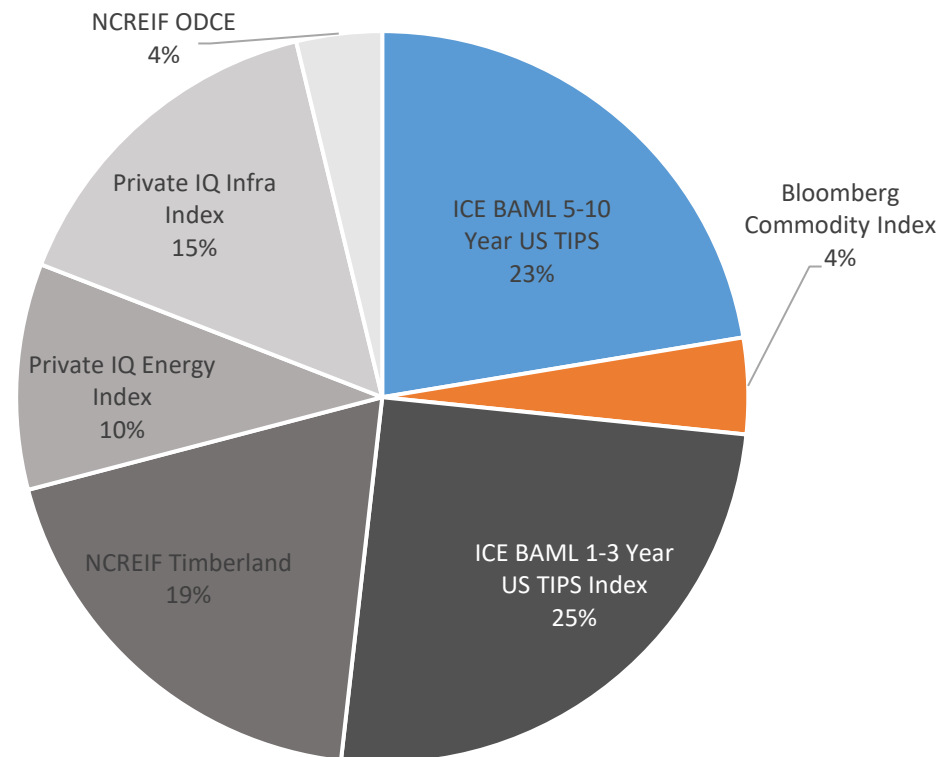
Inflation Sensitive Benchmark Composition

As of December 31, 2022

Long-Term Target Benchmark



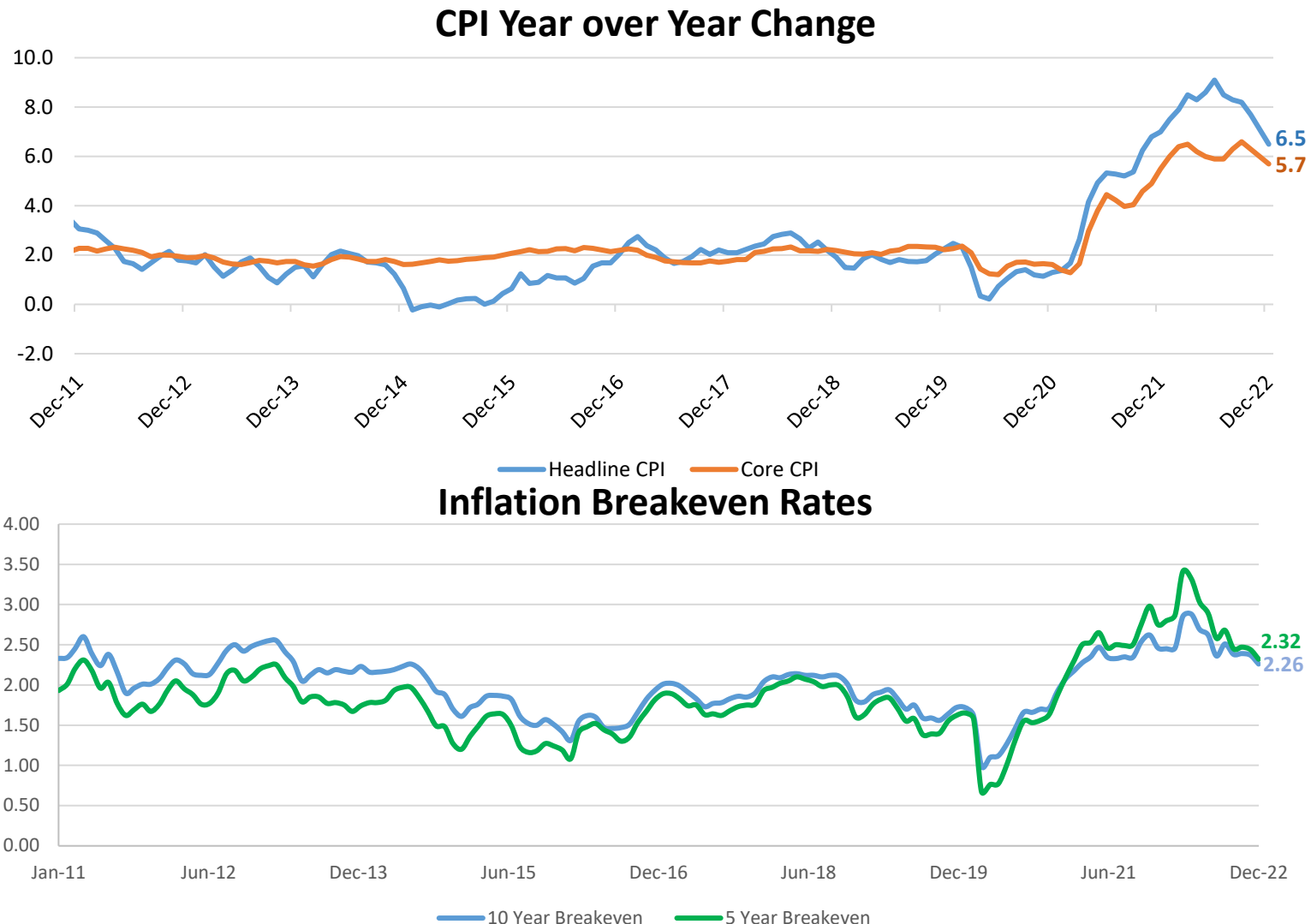
Benchmark Composition by Current Market Weight





Current Inflation Environment

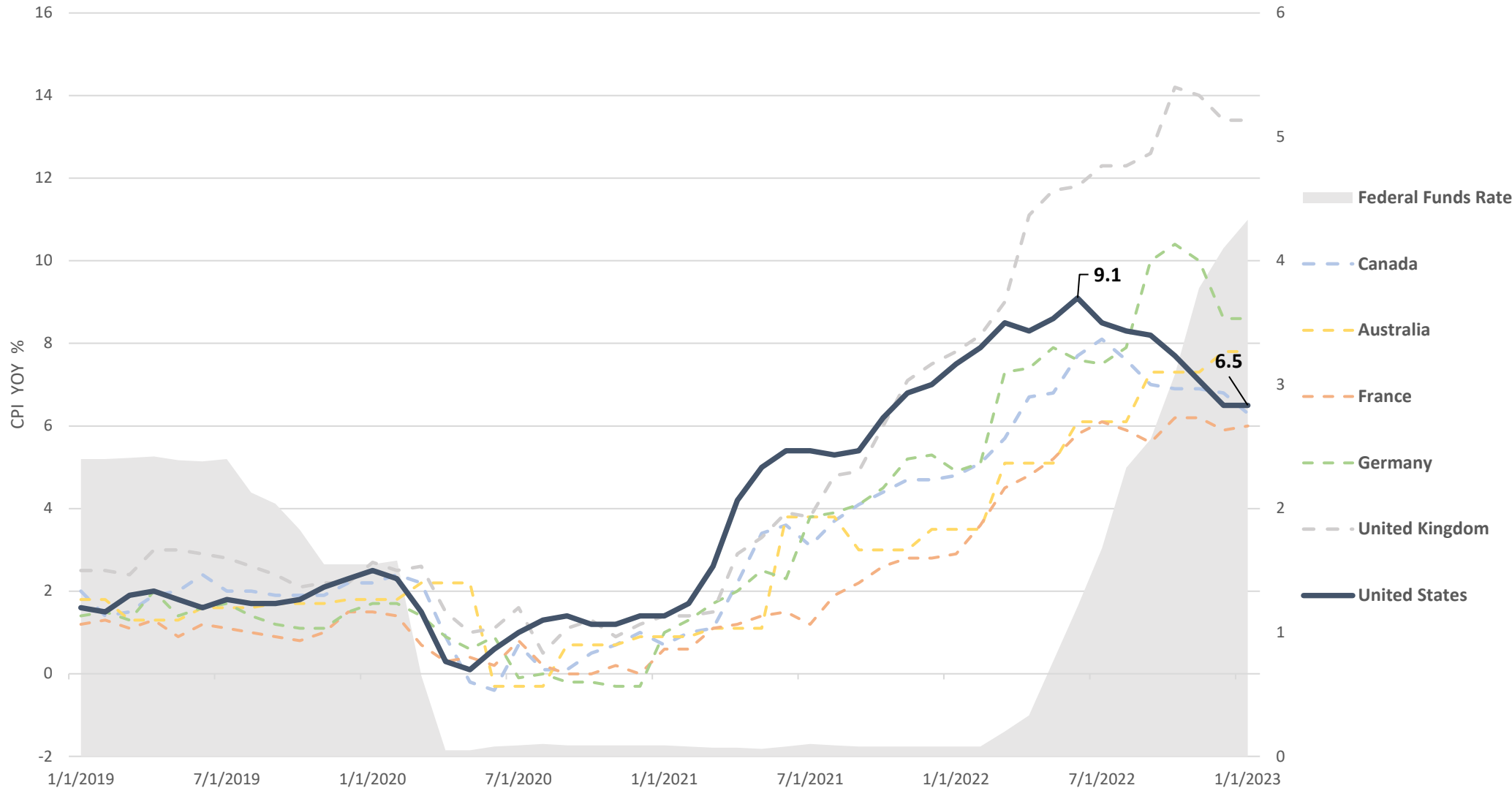
The gap between breakeven expectations and CPI continue to suggest a potential convergence





Current Inflation Environment

Inflation is moderating as federal interest rates have risen dramatically

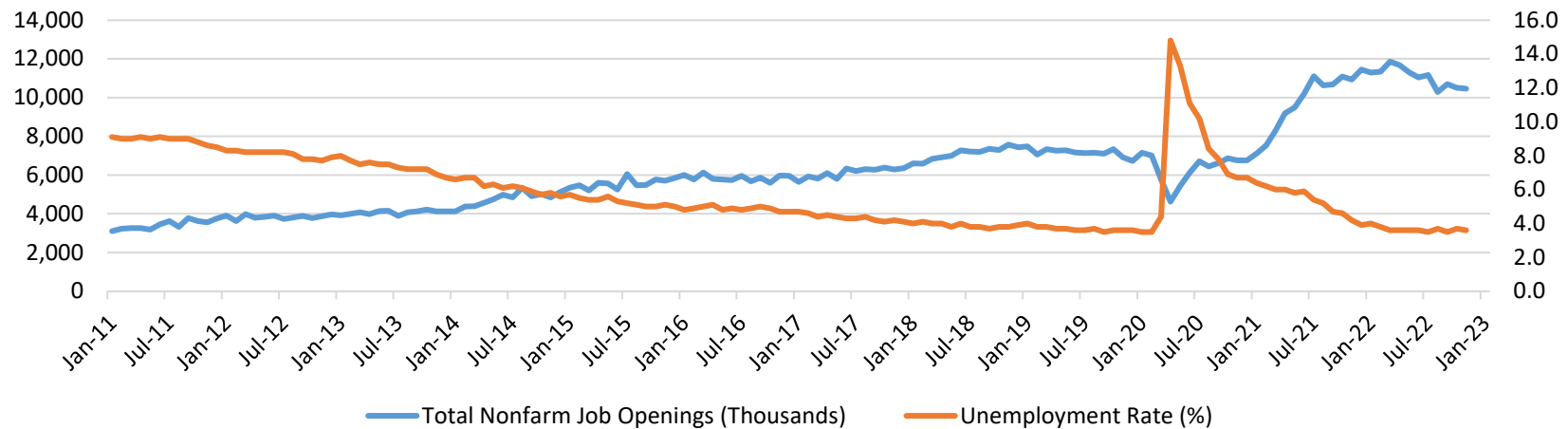




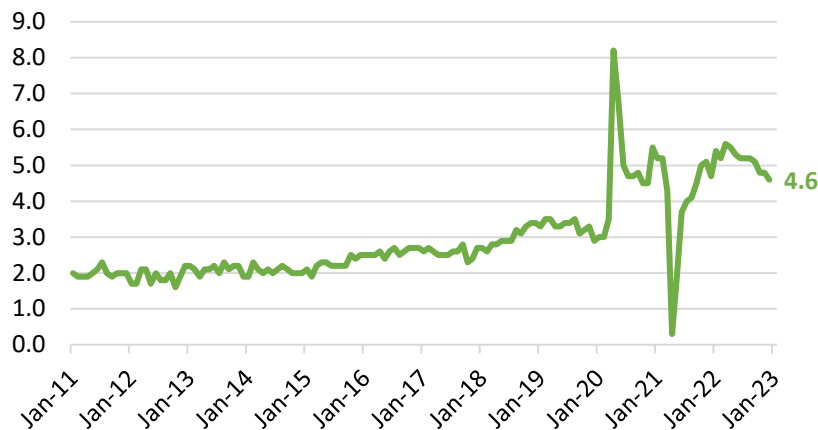
Current Inflation Environment: Labor

Job openings remain high while unemployment rate continues to decline – workers exit the labor force.

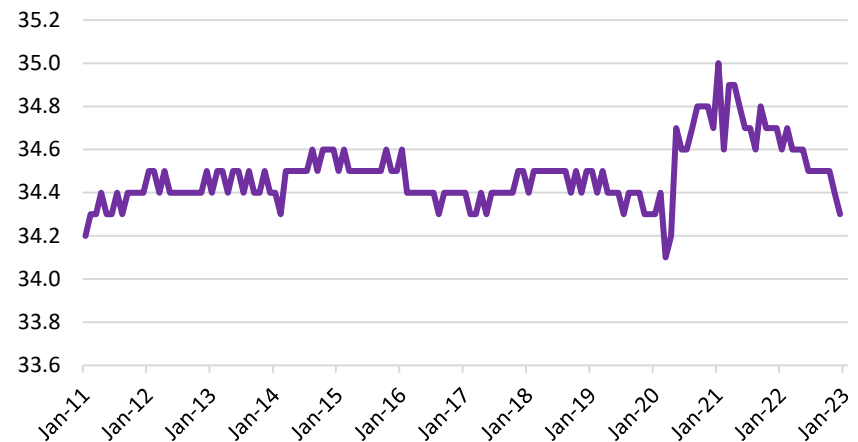
Vacancies vs. Unemployment



Average Hourly Earnings – YoY Change



Average Weekly Hours – Private Sector

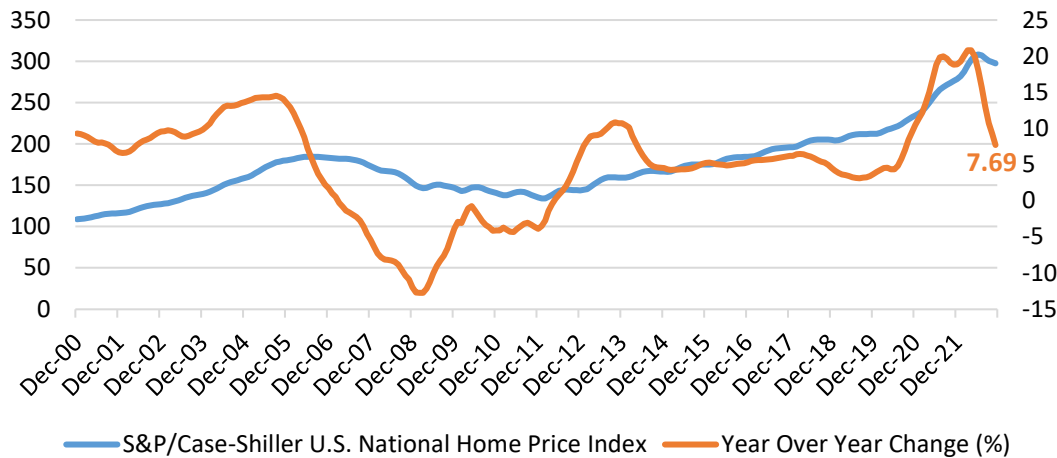




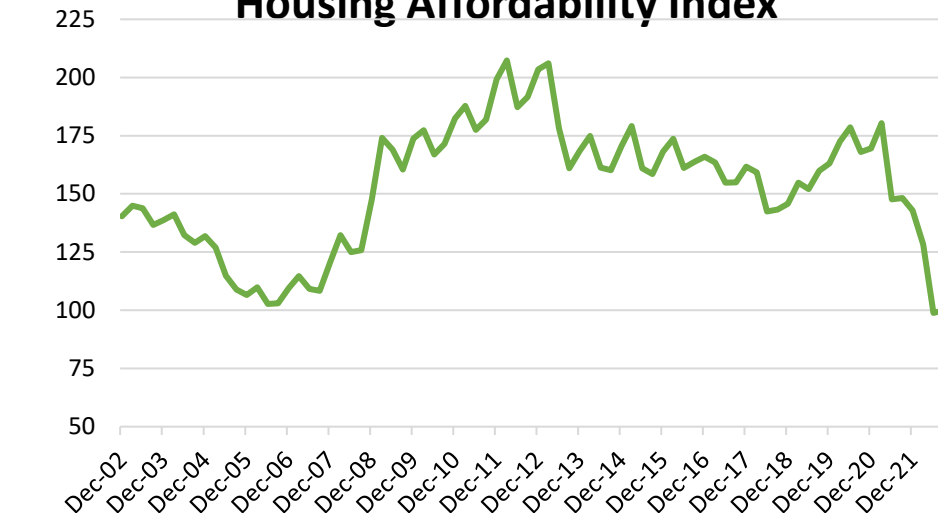
Housing Market Review

Housing is supported by constrained supply and low rates, boosting household balance sheets

Home Price Appreciation

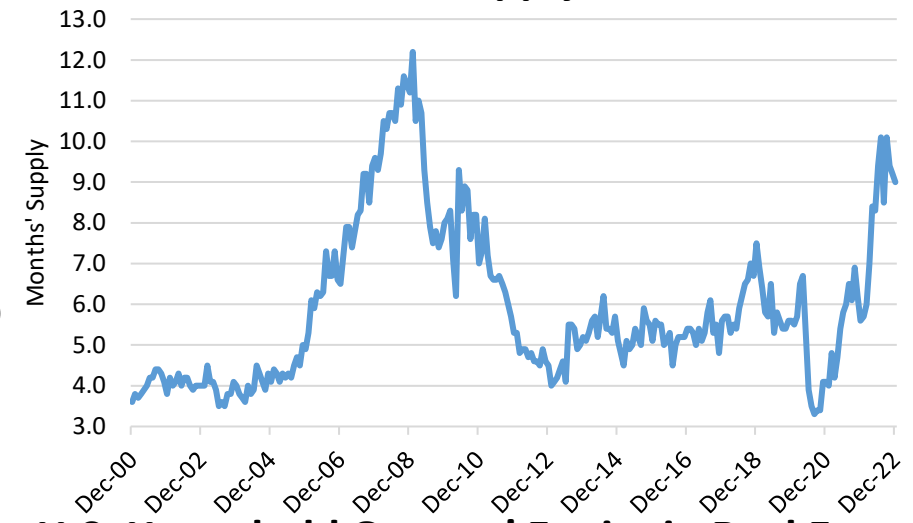


Housing Affordability Index

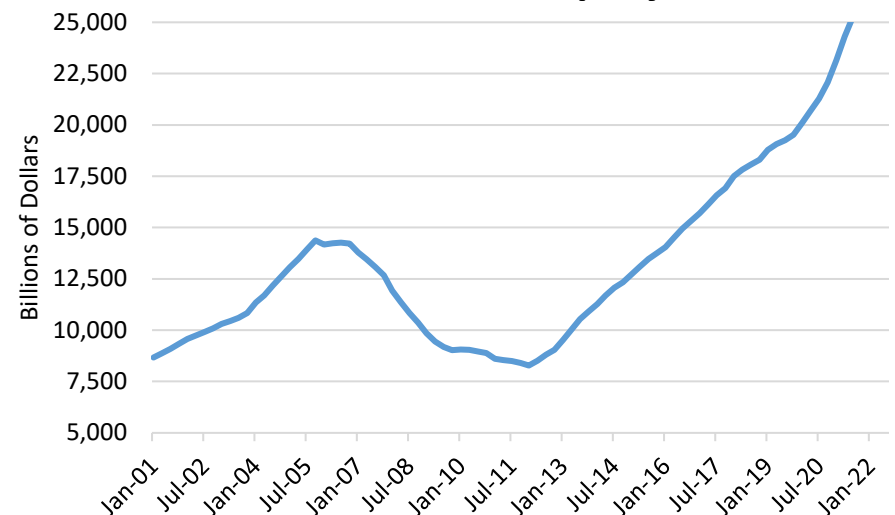


Sources: Federal Reserve Bank of St. Louis, Bloomberg

U.S. Months' Supply of Houses



U.S. Household Owners' Equity in Real Estate





Current Inflation Environment

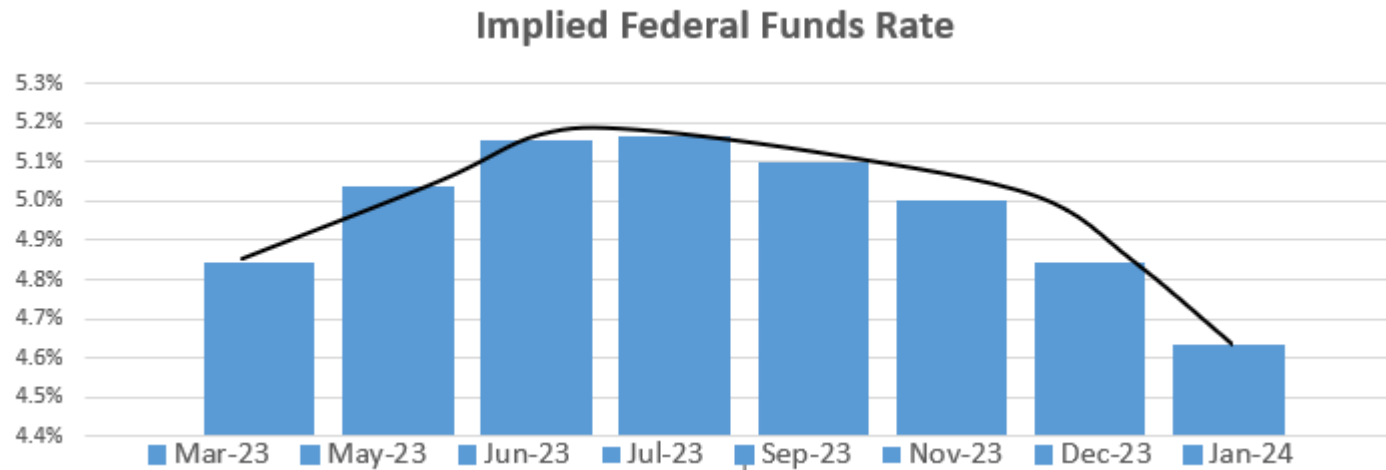
Unprecedented levels of liquidity weakened the Dollar and spurred inflation.



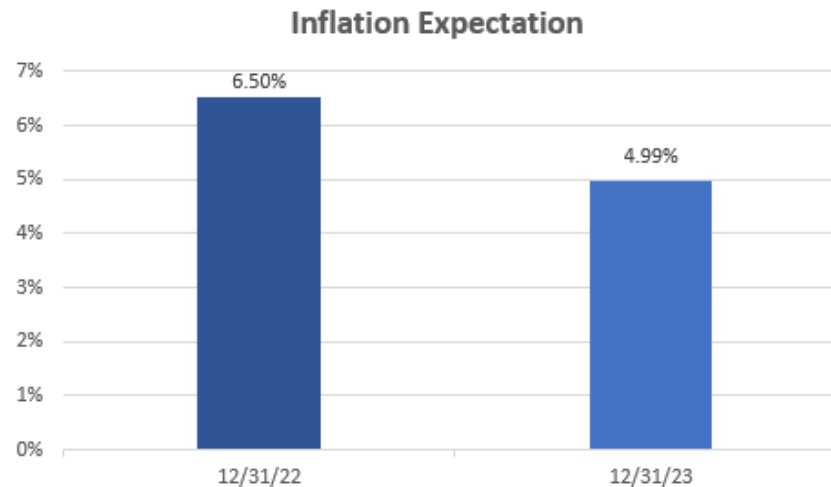


Current Inflation Environment

Markets indicate we will realize rate hikes followed by cuts at year end.



Data provided by Bloomberg as of 2/8/2023



Inflation expectation provided by the University of Michigan inflation survey as of 12/31/2022



Risks to the Current Inflationary Outlook

Downward Pressure

- Federal Reserve and Central Banks continue interest rate hikes and other restrictive policies
- Recession
- Lower wage growth

Uncertain

- Geopolitical unrest is less inflationary than prior occurrences
- Unresolved US/China Trade War

Upward Pressure

- Re-opening of China
- Low unemployment and labor shortages in certain sectors
- Continued Global Supply Chain Disruptions
- Impact of war (Russia / Ukraine)



Strategies of Interest

Energy

- Renewables & Energy Transition
- Storage & Intermittency Management
- Private debt across multiple sectors
- Midstream

Technology & Data

- Cell Towers
- Data Centers
- Fiber
- Music Royalties
- Intellectual Property

Logistics and Other Essential Infrastructure

- Transportation (i.e., leasing assets)
- Storage
- Traditional Infrastructure
- Real Asset focused Secondaries

Health Care

- Dental
- Vision
- Veterinarian
- Drug Royalties
- Real Estate for Medical Practices

Real Estate

- REITS
- CMBS
- RMBS
- Residential Whole Loans
- Floating Rate Debt
- Core Real Estate



Strategic Considerations for 2023

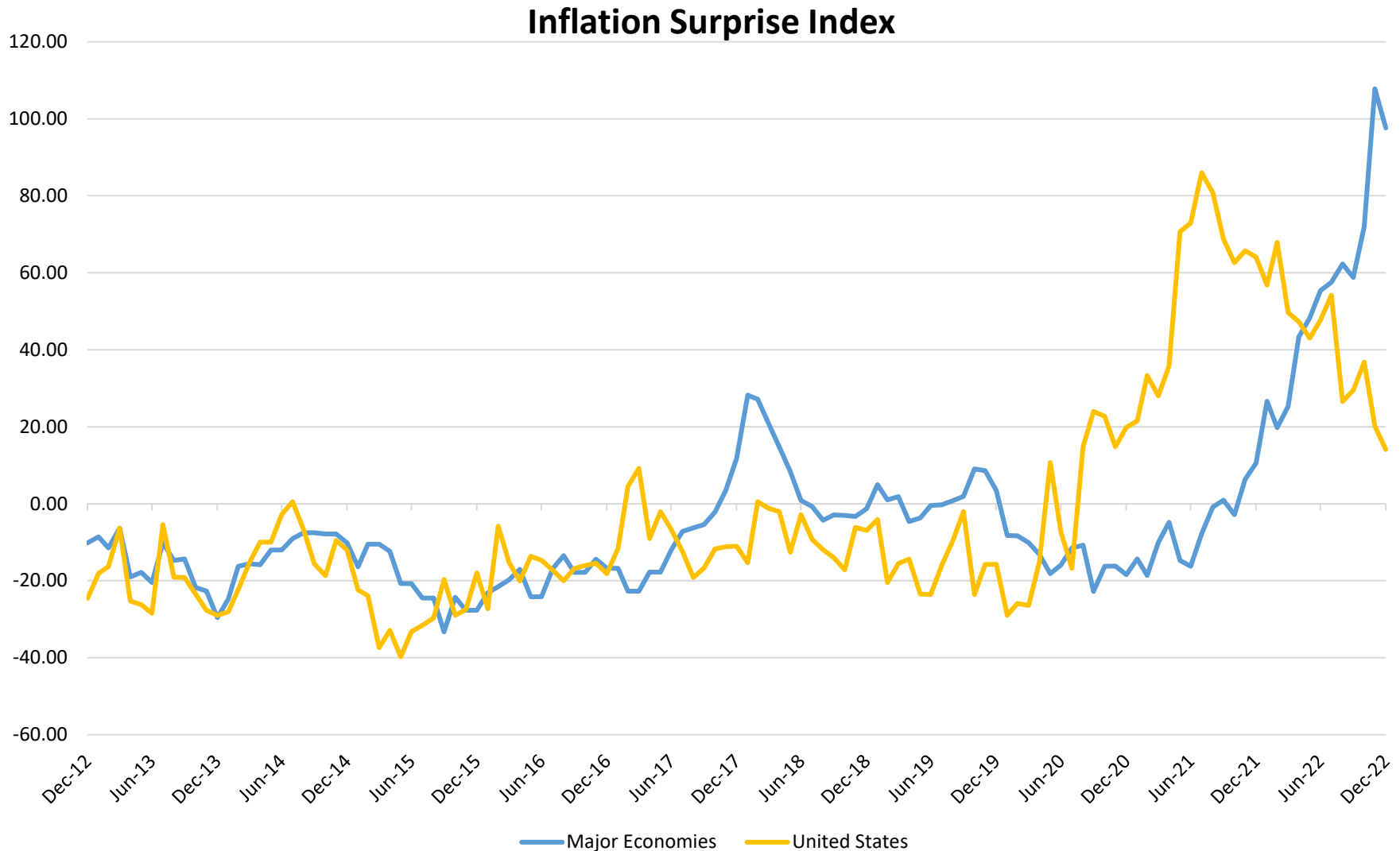
- 1) Rationalize current manager lineup; focus on high conviction opportunities
- 2) Maintain vintage and strategy diversification
- 3) Consider monetizing strategies that may be more susceptible to deflationary pressures



Appendix



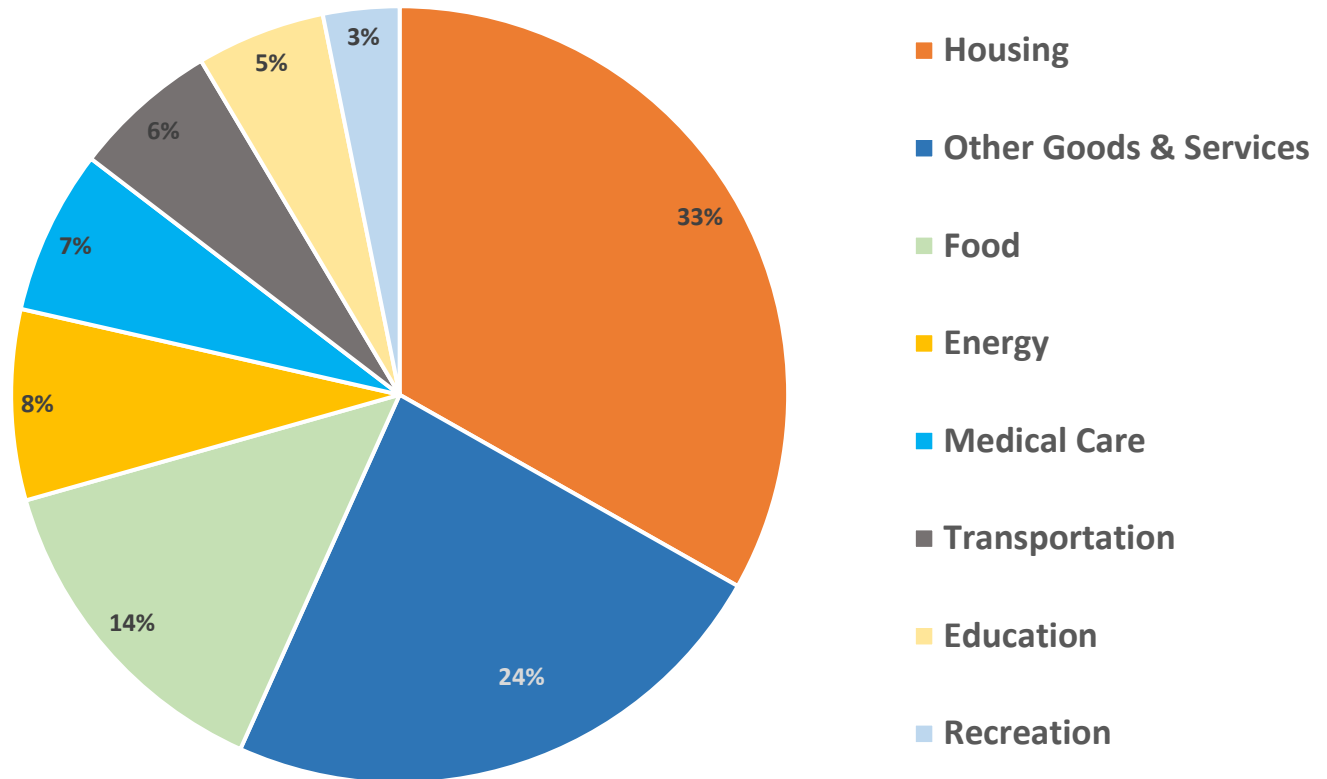
Current Inflation Environment





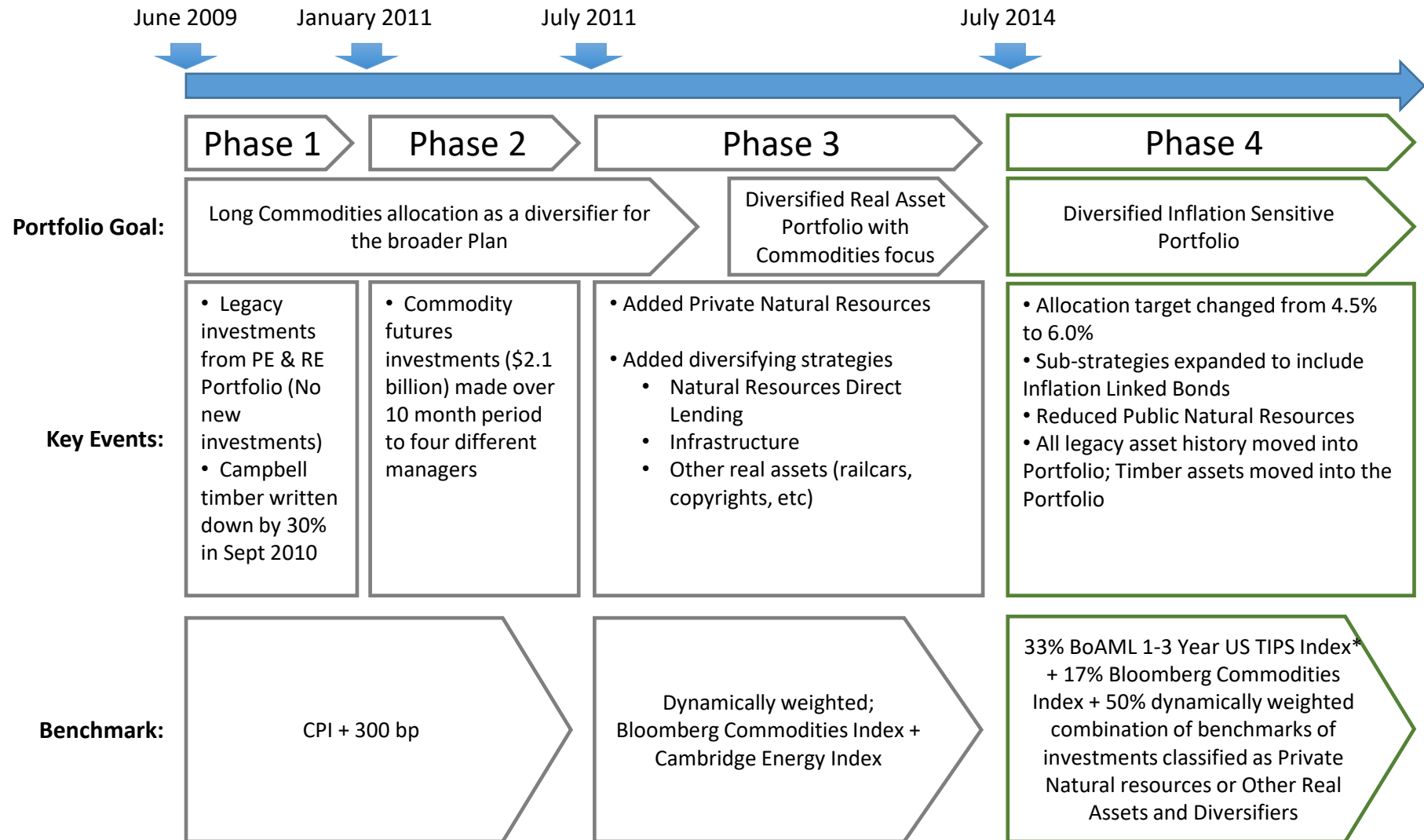
CPI Composition

All Urban Consumers (CPI-U) U.S. Average





Portfolio History



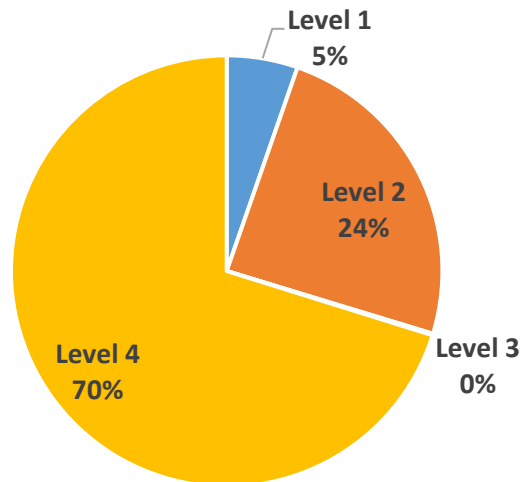
*Source: BofA Merrill Lynch, used with permission; see disclaimer on page 27



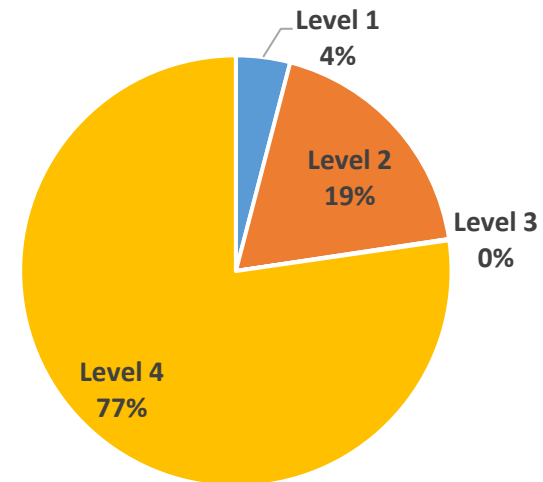
Portfolio Liquidity

As of December 31, 2022

Market Value



Market Value + Unfunded





Performance of Relevant Indices

As of December 31, 2022

Market Returns (%)

	3 Month	6 Month	1 YR	3 YR
S&P 500	7.0805	2.2959	-18.1269	7.6425
S&P Energy	22.7428	25.5572	65.4311	19.2061
Bloomberg Commodities	1.1808	-3.625	13.75	11.7249
Bloomberg High Yield Energy	4.1124	5.3513	-5.5571	2.2187
Bloomberg High Yield	8.1372	7.4384	-7.8073	1.2665
Bloomberg U.S. 1-3 Years TIPS	1.0212	-1.4491	-1.7974	2.4568
S&P 5-10 Year U.S. TIPS	4.2356	-3.3656	-12.0024	1.1588
Bloomberg U.S. 5-10 Year Treasuries	1.1772	-3.7396	-12.5843	-2.5555



Inflation Portfolio IRR by Vintage Year

As of December 31, 2022

Vintage Year	Inflation-Linked Bonds	Publicly Traded Natural Resources	Private Natural Resources	Other Real Assets and Diversifiers	All
1993	-	-	9.38	-	9.38
2006	-	-	0.95	-	0.95
2007	-	-	-7.73	-	-7.73
2008	-	-	-5.67	-	-5.67
2010	-	-3.81	-27.39	-	-5.51
2011	-	-10.33	1.43	2.82	-5.70
2012	-	-	3.53	7.83	5.55
2013	-	-	5.36	7.86	7.22
2014	-	-3.97	8.17	8.78	7.43
2015	1.48	-	12.61	11.18	8.56
2016	2.57	-	-	-	2.57
2017	-	-	3.80	-	3.80
2018	-	-	-	25.93	25.93
2019	-	-	29.42	19.46	27.21
2020	-	-	-	-	-
2021	-	-	-	52.53	52.53
2022	-	-	-	-	-
All	2.43	-6.32	2.44	8.5	2.24



Notes:

All data presented are based on currently available information at time of publication and may be revised subsequently.

The Inflation Sensitive Benchmark is the dynamically weighted combination of the ICE Bank of America Merrill Lynch 1-3 Years U.S. Inflation-Linked Treasury Index (Inflation-Linked Bonds)*, the Bloomberg Commodities Index (Public Natural Resources), and a combination of the benchmarks of investments classified within Private Natural Resources or Other Real Assets and Diversifiers.

The Private Natural Resources Benchmark is the dynamically weighted combination of the benchmarks of investments classified within Private Natural Resources.

The Other Real Assets and Diversifiers Benchmark is the dynamically weighted combination of the benchmarks of investments classified within Other Real Assets and Diversifiers.

The Inflation Sensitive asset class (G.S. 147-69.2(b)(9a)) was created by the General Assembly in June 2009. It included some investments that were previously authorized under other provisions of G.S. 147-69.2.

*Source: BofA Merrill Lynch, used with permission. See disclaimer on next page.



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