



Measuring Investment Performance with Rising Interest Rates

April 2017

PFM Asset
Management LLC

222 North LaSalle
Suite 910
Chicago, IL 60601

312.977.1570
pfm.com



Agenda

- ◆ Market Update
- ◆ Measuring Results
- ◆ CFOs' Interest Rate Forecasts



Market Update



U.S. Treasury Yields

Yield History Past 12 Months

— 2-Year Treasury



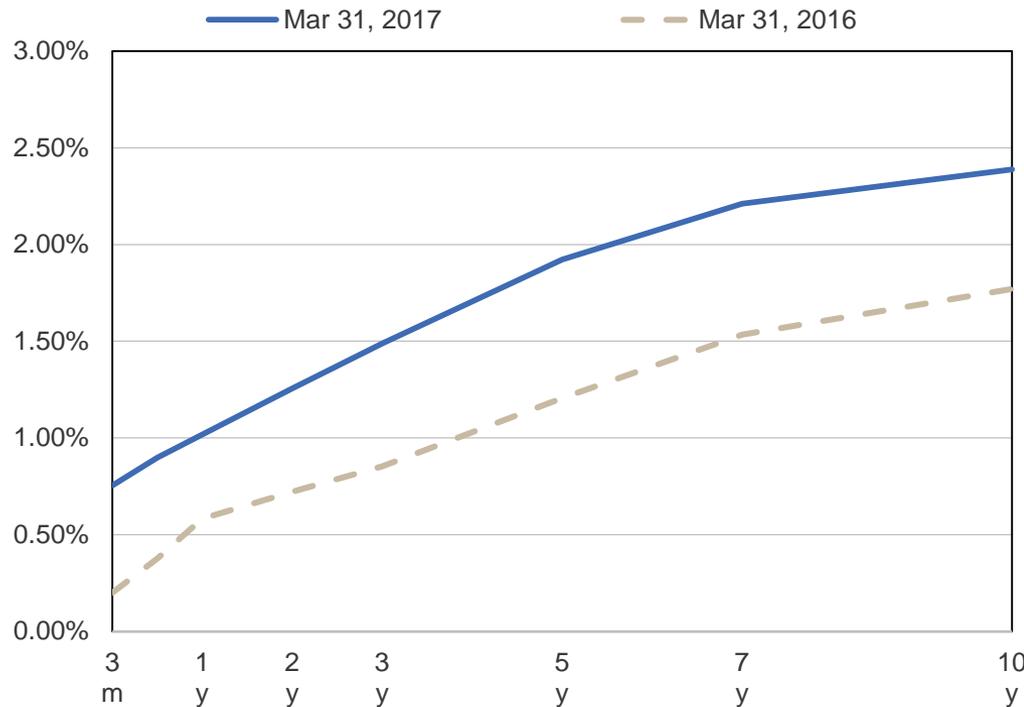
Source: Bloomberg, as of 03/31/17.



Interest Rates Move Up

- Treasury rates surged following the U.S. elections, with longer maturities rising substantially due to higher inflation expectations from the President's proposed fiscal policies; the shorter end of the curve also moved higher as market participants priced in rate hikes in December 2016 and March 2017

U.S. Treasury Yield Curve



Yield Curve History

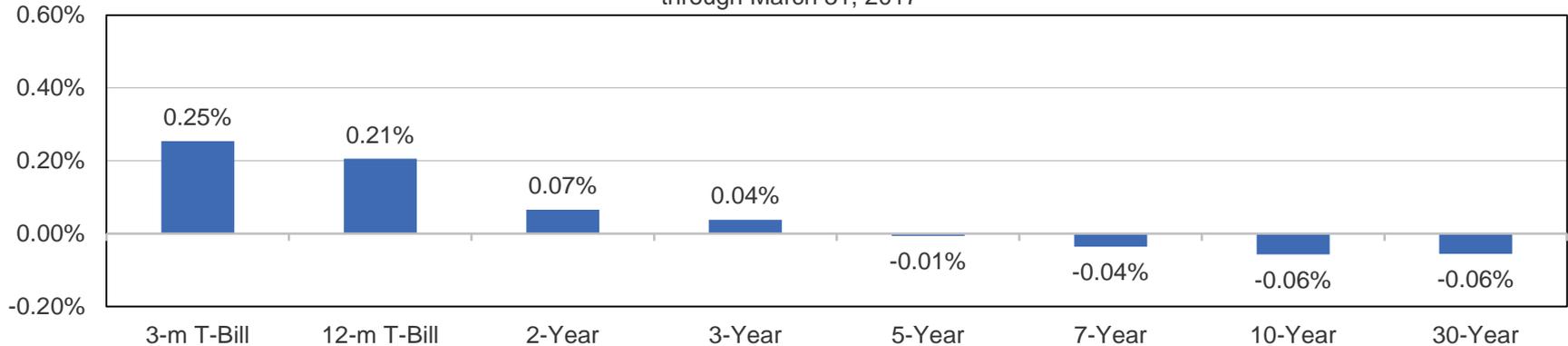
Maturity	03/31/17	03/31/16
1-Mo.	0.73%	0.17%
3-Mo.	0.75%	0.20%
6-Mo.	0.90%	0.38%
1-Yr.	1.02%	0.58%
2-Yr.	1.26%	0.72%
3-Yr.	1.49%	0.85%
5-Yr.	1.92%	1.21%
7-Yr.	2.21%	1.53%
10-Yr.	2.39%	1.77%
30-Yr.	3.01%	2.61%

Source: Bloomberg, as of 03/31/17.

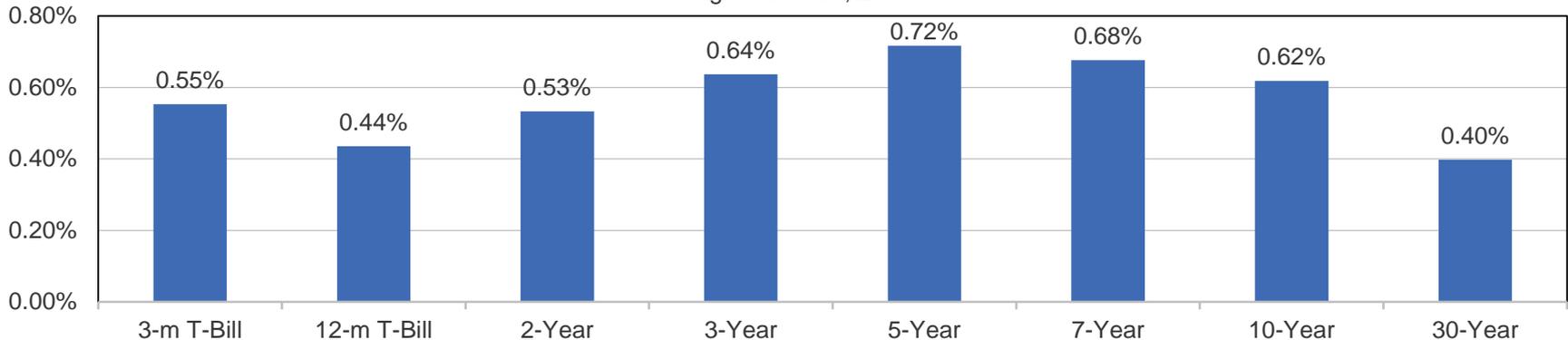


Long-Term U.S. Treasury Yields Little Changed in the First Quarter

3-Months Change in Yield
through March 31, 2017



1-Year Change in Yield
through March 31, 2017



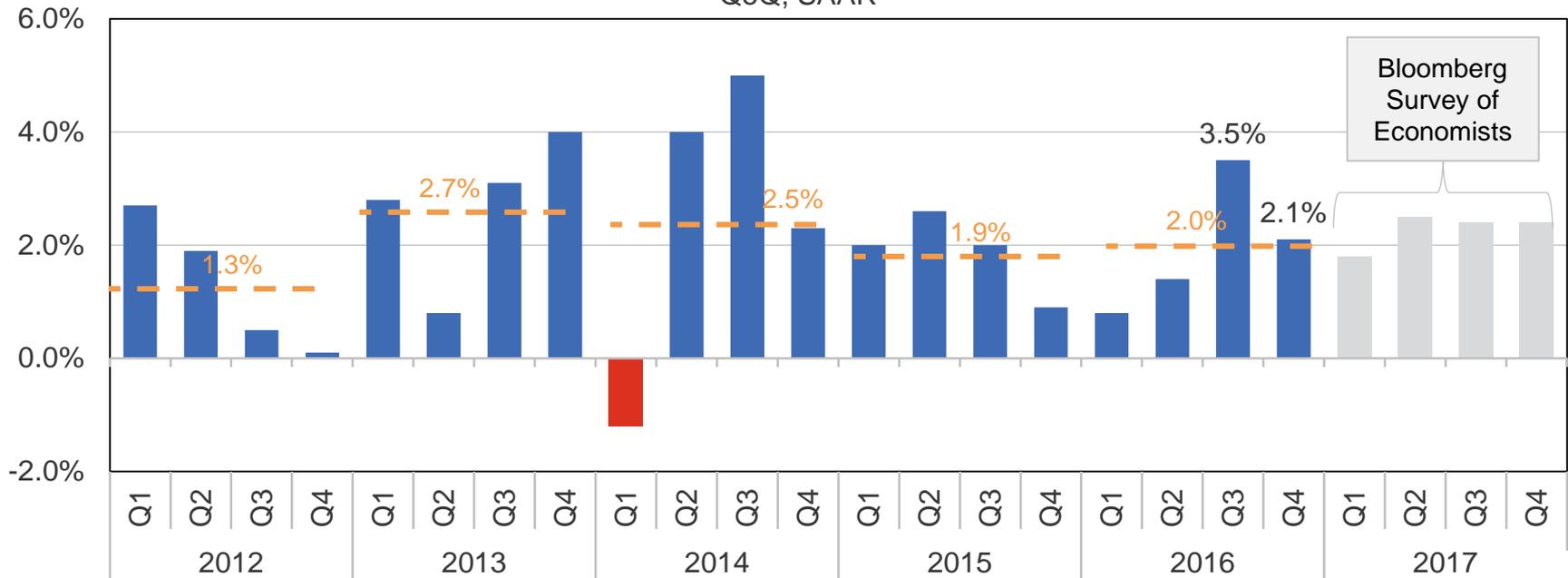
Source: Bloomberg, as of 03/31/17.



Economic Growth Slowed in 4th Quarter Due to One-Time Factor

- Gross domestic product increased at an annualized rate of 2.1% in the fourth quarter, down from the 3.5% pace of the prior quarter prior, resulting in an average 2.0% rate of growth for 2016
- Fourth quarter GDP reflected positive contributions from personal consumption, fixed investment, private inventories, and government expenditures; however, these drivers of growth were offset by a large decline in net exports, a one-time factor

U.S. Real GDP
QoQ, SAAR



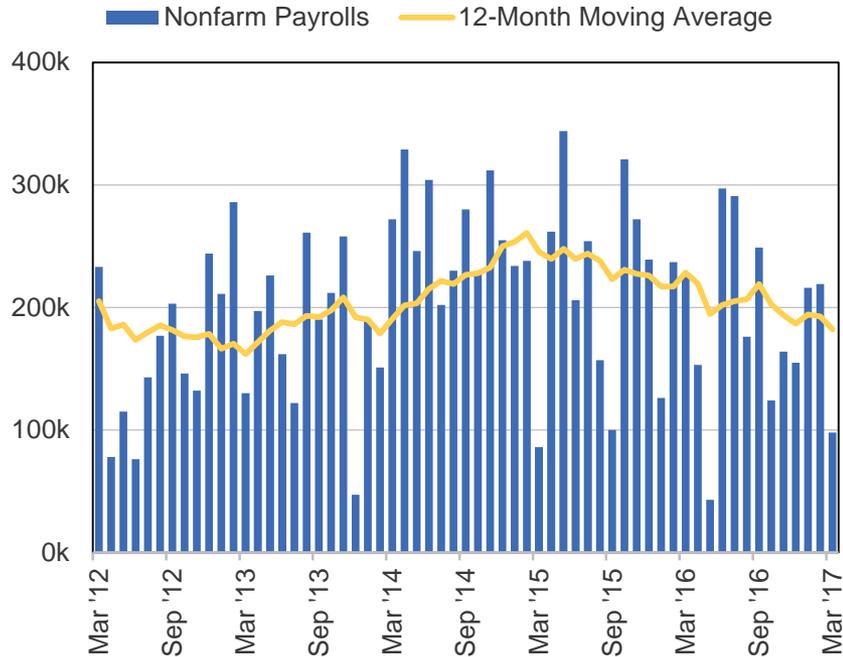
Source: Bloomberg, as of March 2017. SAAR is seasonally adjusted annualized rate.



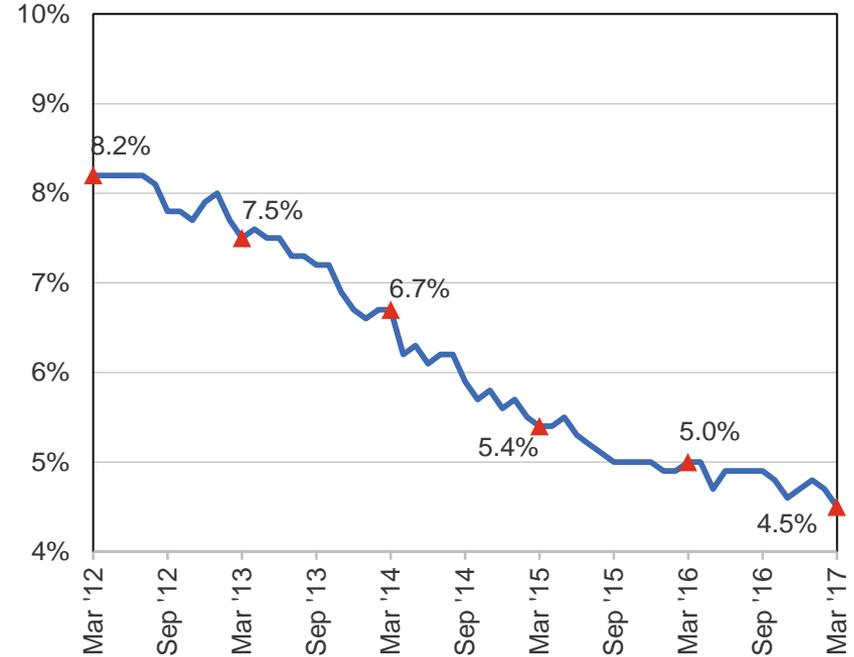
Labor Market Strength Continues

- The U.S. labor market continues to tighten, adding an average of 182,000 jobs per month over the past year
- The headline unemployment rate fell to 4.5% while the U-6 rate, which includes part-time and discouraged workers for economic reasons, dropped to 8.9%, the lowest since 2007
- The annual growth rate of average hourly earnings – an important gauge of wage growth – averaged 2.7% over the past 12 months

Monthly Change in Nonfarm Payrolls



Unemployment Rate



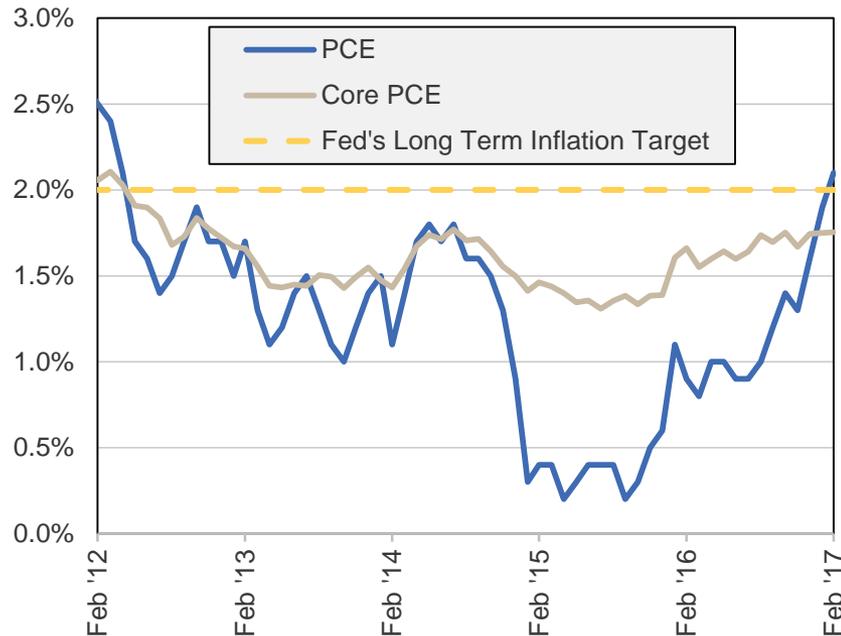
Source: Bloomberg, as of March 2017.



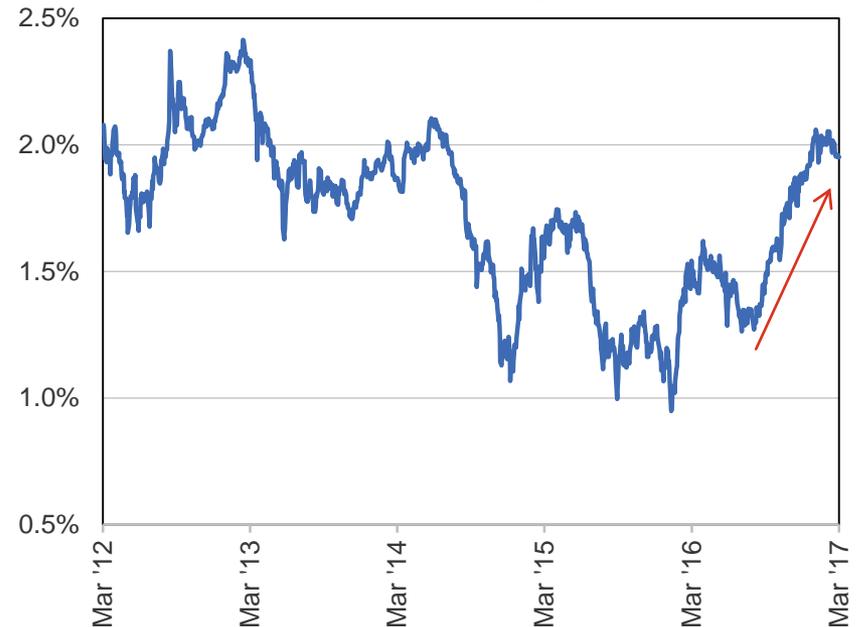
Inflation Rising, but Slowly

- The core personal consumption expenditures (PCE) price index, the Fed's preferred gauge of core inflation, ticked up to 1.8% year-over-year through February, continuing to modestly undershoot the Fed's 2.0% target
- However, investors are expecting inflation to pick up, with market expectations for inflation over the next five years recovering to levels last seen in 2014; should President Trump realize his proposed spending policies, price pressures could increase and prompt the Fed to raise rates faster.

Inflation Measures
(YoY)



Expectations for Average Inflation Rate over next 5 years



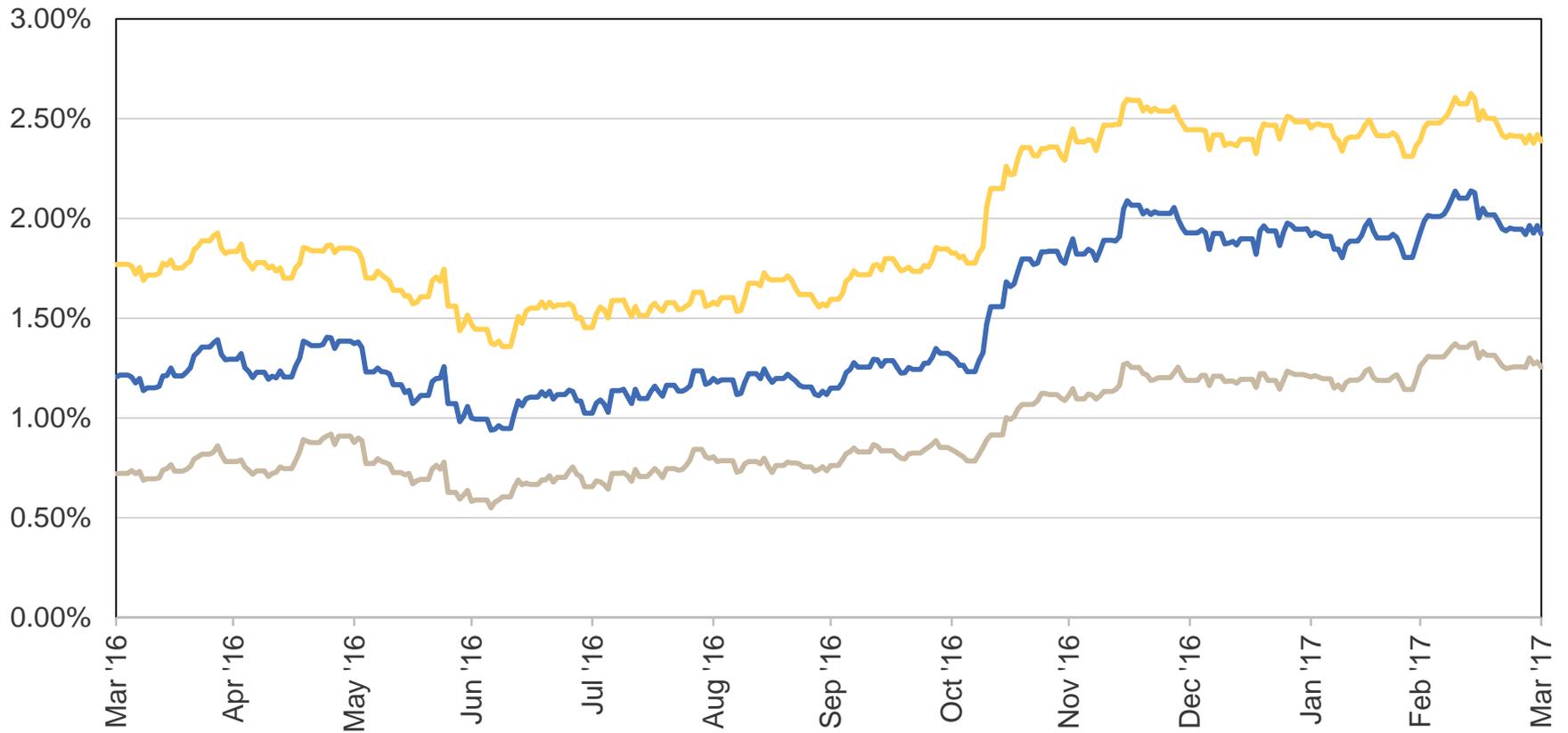
Source: Bloomberg, as of 03/31/17. Inflation expectations based on yield difference between 5-year Treasury note and 5-year Treasury Inflation Protected Securities (TIPS).



U.S. Treasury Yields

Yield History Past 12 Months

— 2-Year Treasury — 5-Year Treasury — 10-Year Treasury

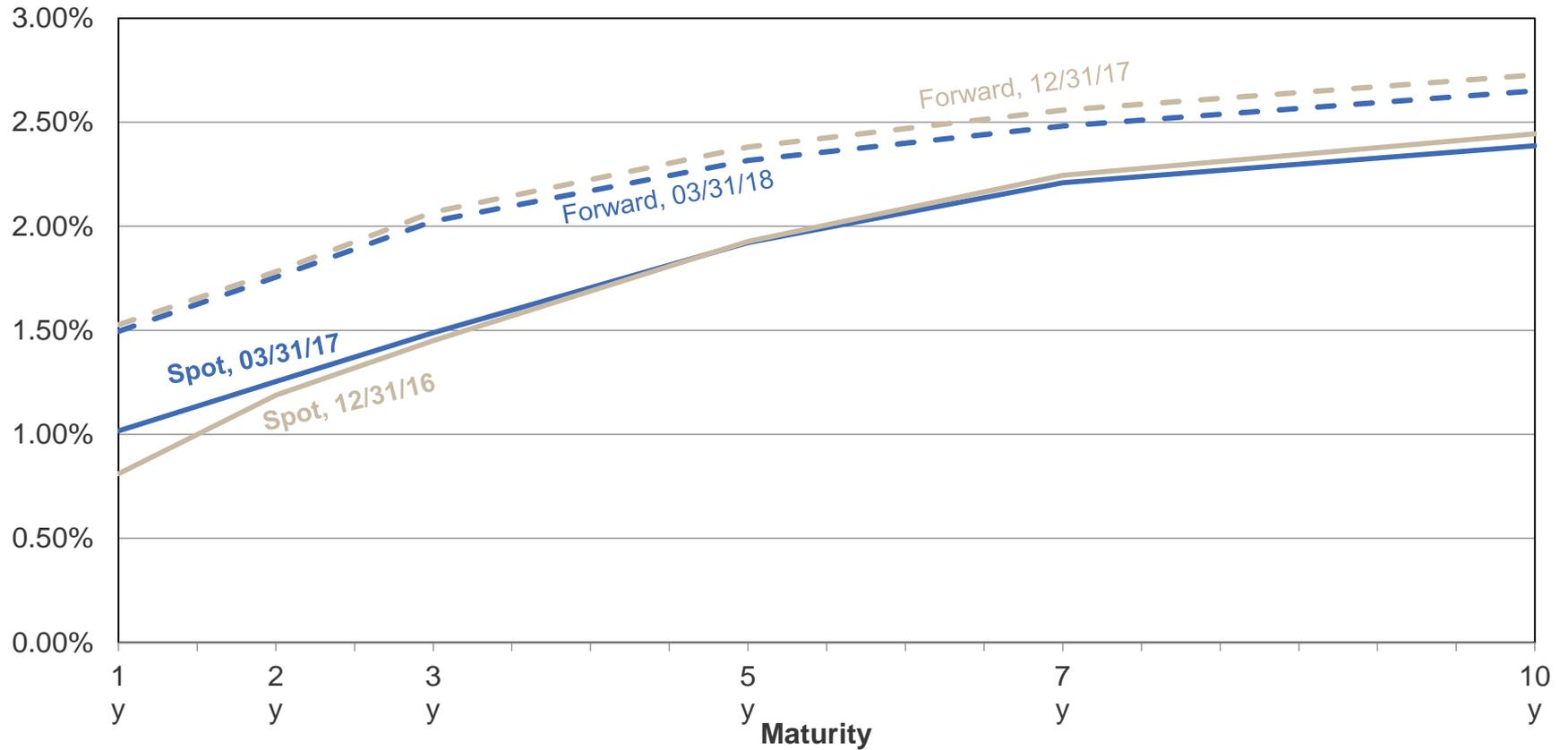


Source: Bloomberg, as of 03/31/17.



Rate Expectations

U.S. Treasury Yields vs. 1-year Forward Yields



Source: Bloomberg, as of 03/31/17.

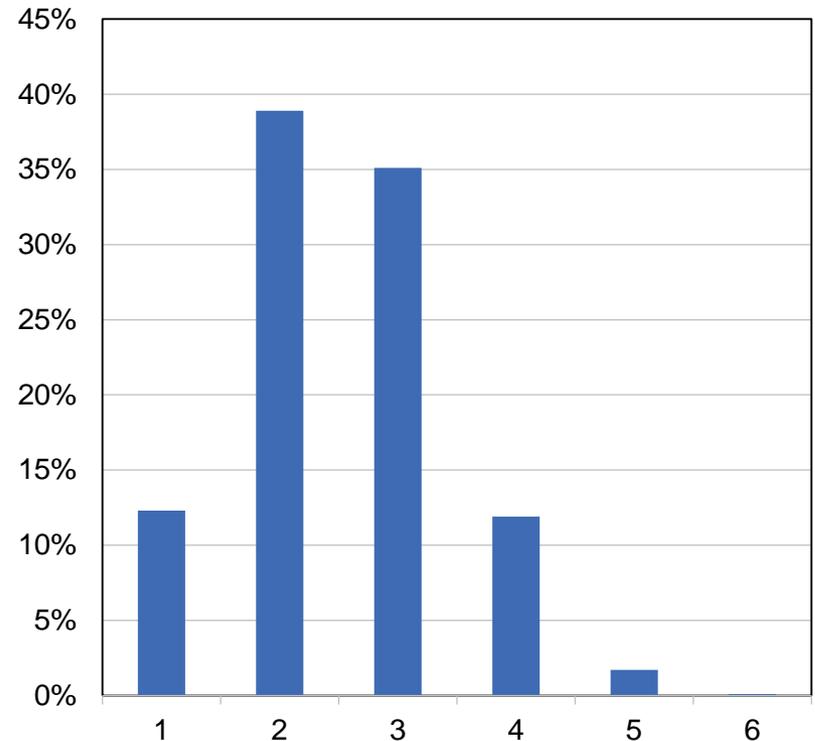


Fed Rate Hikes Expected in 2017

Probability of Fed Rate Hike

Meeting	4/24/2017
5/3/2017	11%
6/14/2017	69%
7/26/2017	72%
9/20/2017	84%
11/1/2017	84%
12/13/2017	88%
1/31/2018	88%

Number of Additional Rate Hikes Expected in 2017



Source: Bloomberg, as of 04/24/17. Rate hike assumed to be 25bps increase from 0.50% – 0.75%. Current fed funds rate at 0.75% – 1.00%.



Major Considerations for Next Interest Rate Increase

Impacts of Quick Tightening	Impacts of Slow Tightening
Large market value losses – over shorter timeframe	Smaller market value losses – over extended timeframe
Capture higher interest rates more quickly	Measured rise in rates
Rapid rise in inflation	Slower rise in inflation
Possible recovery killer due to high cost of credit	Possible investment bubbles



Developing an Investment Program: Measuring Results



Performance Measures

- Yield
 - Yields are prospective and show anticipated performance for future periods, using information available when the yield was calculated
 - Measures the expected rate of future earnings (assuming reinvestment at the same yield)
 - Fixed at purchase
 - Easy to track
- Total Return
 - Returns are retroactive and show actual performance for a specific prior period
 - Measures change in portfolio value over the measurement period
 - Includes accrued earnings, plus realized gains / losses, plus unrealized gains / losses
 - Based on the portfolio's value if it were sold
 - Used by most money managers and mutual funds
 - Harder to calculate
 - Market values are affected by changes in interest rates, yield spreads and volatility



Total Return versus Book Value Return

- An entity buys \$1,000,000 par value of 5-Year Treasury Notes at a yield of 5.00%; the Notes have a coupon of 5.00% and were purchased at par

Scenario - After 3 Months	Total Return		Book Value Return	
Interest Rates Are Unchanged	Market Value of Securities	\$1,000,000	Book Value of Securities	\$1,000,000
	Accrued Interest	\$12,500	Accrued Interest	\$12,500
	Total	\$1,012,500	Total	\$1,012,500
	Total Return = 5.00%		Book Value Return = 5.00%	
Interest Rates Have Increased by 25 Basis Points	Market Value of Securities	\$989,528	Book Value of Securities	\$1,000,000
	Accrued Interest	\$12,500	Accrued Interest	\$12,500
	Total	\$1,002,028	Total	\$1,012,500
	Total Return = 0.81%		Book Value Return = 5.00%	
Interest Rates Have Decreased by 25 Basis Points	Market Value of Securities	\$1,010,446	Book Value of Securities	\$1,000,000
	Accrued Interest	\$12,500	Accrued Interest	\$12,500
	Total	\$1,022,946	Total	\$1,012,500
	Total Return = 9.49%		Book Value Return = 5.00%	



GFOA Best Practices

RECOMMENDATION:

The Government Finance Officers Association recommends that government investors assess their investment portfolio for performance and risk by comparing the total return of the portfolio to carefully selected benchmarks. Total return provides a complete snapshot of the outcomes resulting from investment decisions since it measures the percent change in the value of a portfolio over a defined historical period.

1. Total return comparisons should be completed as least quarterly and more often for portfolios managed by external providers and those containing large investments.

Any total return measurement that is much greater or much less than that of the benchmark should be analyzed since significant deviations between the total return measurement and the benchmark often correlates to the portfolio risk profile. Based on total return analysis, investment managers can make adjustments to the portfolio's risk profile when it is determined to be outside the acceptable variance with the benchmark.

To provide a valid reference for comparison of an entity's investment portfolio, it is important to select a benchmark that closely resembles policy constraints and management practice in terms of

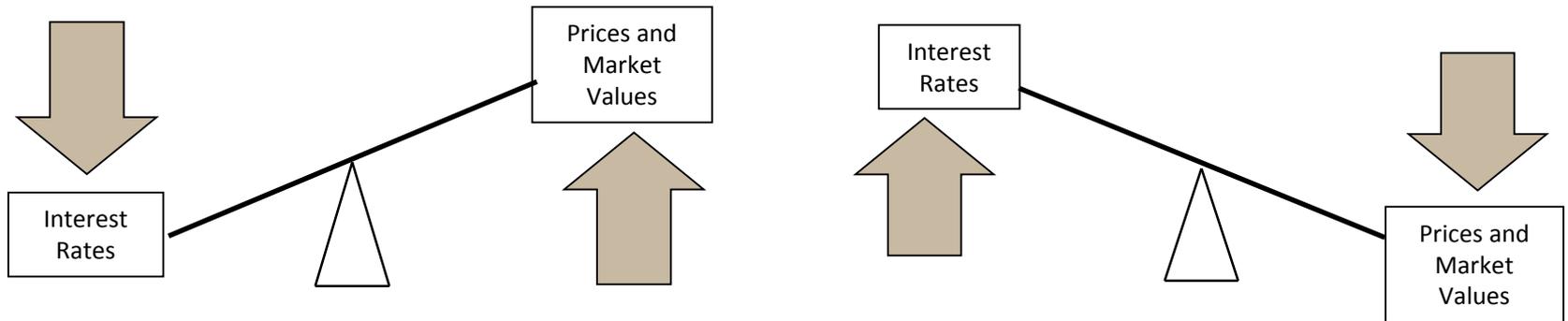


Top Reasons to Use Total Return

- GASB 31
- Reflects “true” value of portfolio
- Leads to accurate economic analysis of trades
- Demonstrates value over the long run
- Industry standard
- Helps to identify certain risks (i.e., if market value is falling)
- Creates long-term rather than short-term focus
- Performance benchmarks are total return based
- Helps to discourage “yield chasing”
- Shows unrealized gains/losses that **would** occur **if** unexpected liquidity needs would force early sale of securities



The Bad News: Unrealized Market Value Losses



Portfolio size: \$20 million*
Assuming instantaneous increase in rates

	Rates +0.25%	Rates +0.50%	Rates +0.75%
Market Value Change	(90,461)	(180,923)	(271,384)
Market Value Post Rate Increase	\$19,909,539	\$19,819,077	\$19,728,616

* Based on sample portfolio with duration of 1.80 years.



Historically, Longer Portfolios Outperform Over Time...

- Longer-term investment portfolios historically have generated significantly higher earnings relative to liquidity vehicles

Risk / Return of Various Benchmarks 10 Years Ended 3/31/2017				
BoA / ML Index	Duration	Average Annual Return	Cumulative Value of \$25,000,000	Value over 3-Month Treasury Index
3-Month Treasury Index	0.24 Years	0.68%	\$26,759,495	-
1 Year Treasury Index	0.99 Years	1.32%	\$28,494,479	+\$1,734,984
1-3 Year Treasury Index	1.89 Years	2.01%	\$30,495,862	+\$3,736,367
1-5 Year Treasury Index	2.70 Years	2.65%	\$32,480,813	+\$5,721,318

Source: BofA / Merrill Lynch Global Bond Indices



...But, Experience Higher Levels of Volatility

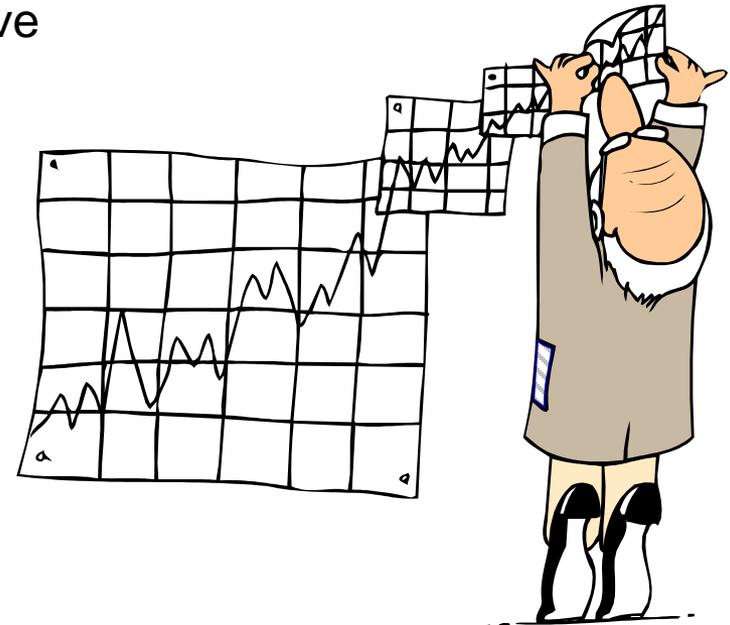
Return Volatility of Various Benchmarks 10 Years Ended 3/31/2017		
BoA / ML Index	Duration	Quarters with Negative Returns
3-Month Treasury Index	0.24 Years	0 out of 40
1 Year Treasury Index	0.99 Years	5 out of 40
1-3 Year Treasury Index	1.89 Years	8 out of 40
1-5 Year Treasury Index	2.70 Years	12 out of 40

Source: BofA / Merrill Lynch Global Bond Indices



Accountability with Benchmarks

- Definition
 - Performance benchmark is a market index or combination of market indices
- Purpose
 - Provide “yardstick” for measuring relative performance over multi-year periods
 - Provide for comparison of risk and return
 - Evaluate investment strategy





Summary

- Interest rates will rise
 - When?
 - How fast?
- There are opportunities for your investment program:
 - Maturity management
 - Evaluation of benchmarks
 - Understanding opportunity costs



***“Best time to invest was yesterday.
Next best time to invest is today.
Worst time to start investing is tomorrow.”***



CFOs' Interest Rate Forecasts



Economist Survey Forecasts

U.S. Indicator	Actual				Forecast		
	Q1-16	Q2-16	Q3-16	Q4-16	Q1-17	Q2-17	Q3-17
GDP QoQ % (SAAR)	0.8%	1.4%	3.5%	2.1%	1.8%	2.5%	2.4%
CPI YOY %	1.1%	1.0%	1.1%	1.8%	2.6%	2.4%	2.6%
Core PCE YOY %	1.6%	1.6%	1.7%	1.7%	1.7%	1.7%	1.8%
Unemployment Rate %	4.9%	4.9%	4.9%	4.7%	4.7%	4.6%	4.6%
Budget % of GDP	-2.5%	-2.8%	-3.1%	-3.1%	-3.4%	-3.2%	-3.2%
Fed Funds Target Rate	0.50%	0.50%	0.50%	0.75%	1.00%	1.15%	1.30%
3-Month LIBOR	0.63%	0.65%	0.85%	1.00%	1.15%	1.42%	1.58%
2-Year Treasury	0.72%	0.58%	0.76%	1.19%	1.26%	1.51%	1.66%
10-Year Treasury	1.77%	1.47%	1.60%	2.45%	2.39%	2.65%	2.78%

Source: Bloomberg Survey of Economists, as of 04/04/2017.



Questions



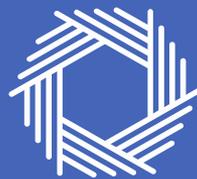


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