

Asset Allocation: When Conventional Wisdom Fails

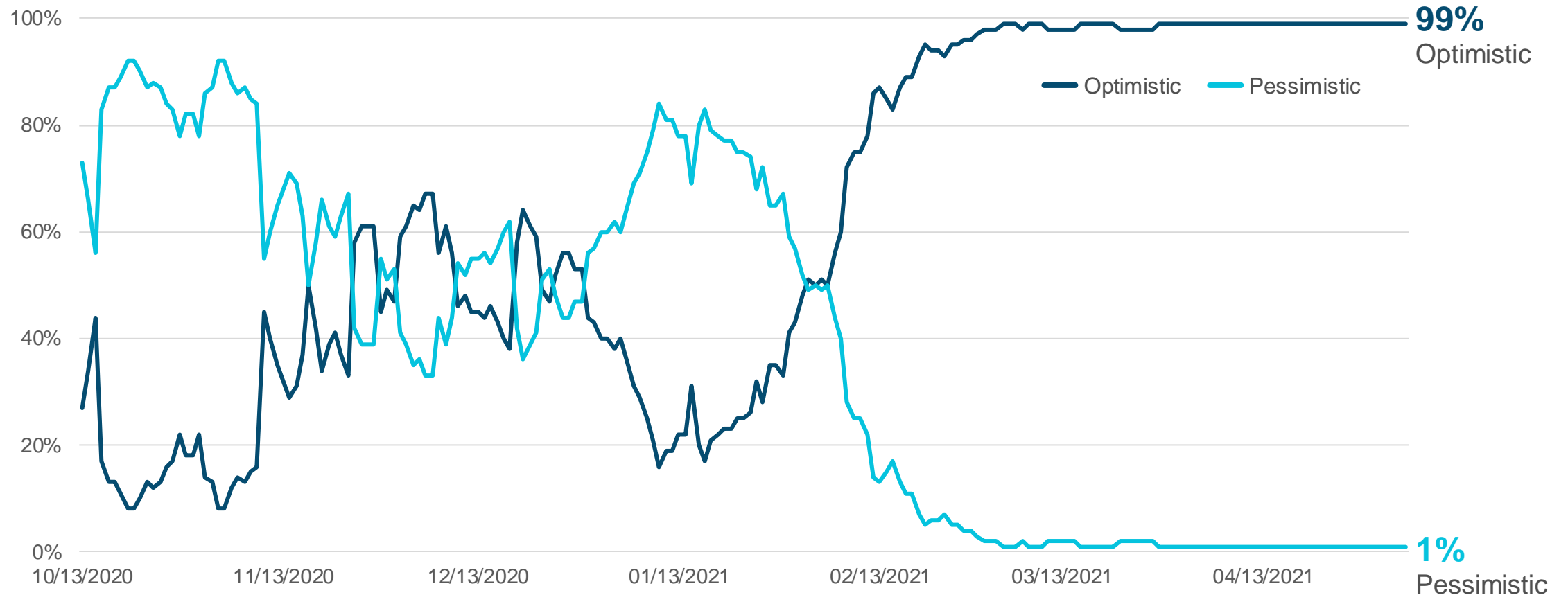
AAll - May 2021

Sébastien Page, CFA
Head of Global Multi-Asset,
T. Rowe Price



When will enough doses of FDA-approved COVID-19 vaccine(s) to inoculate 200 million people be distributed in the United States?

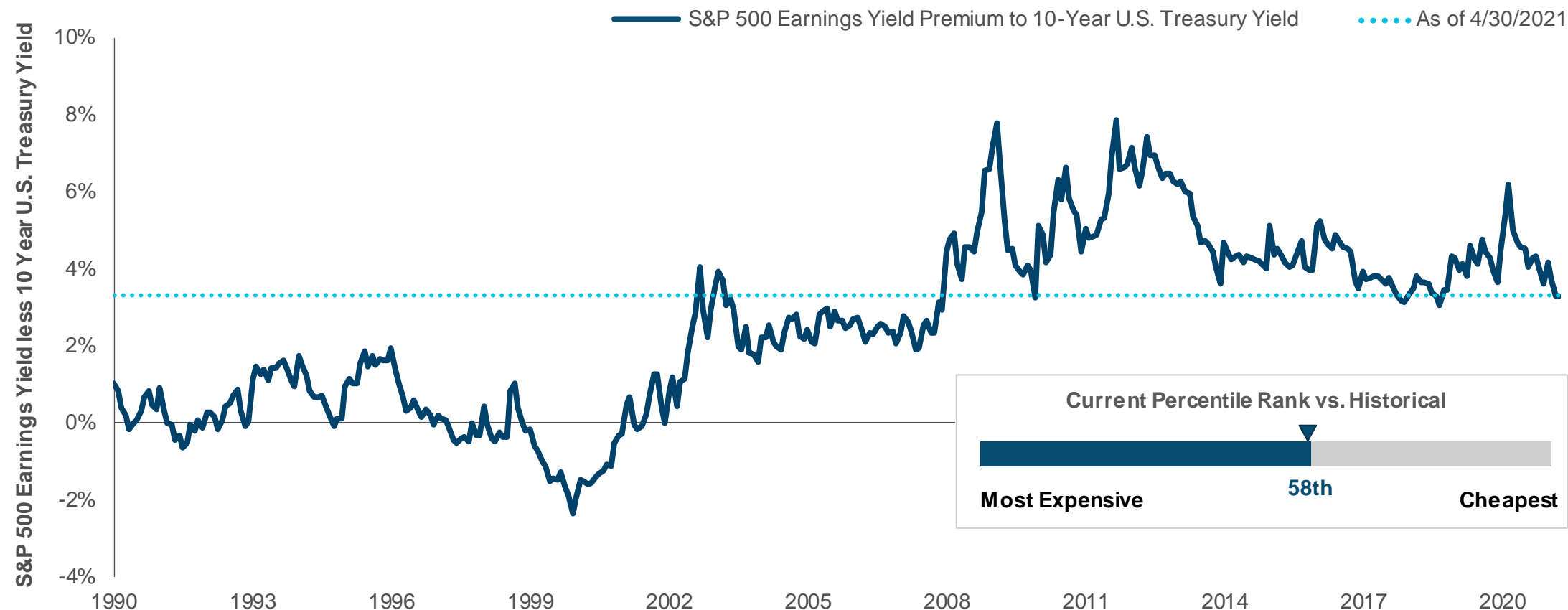
10/13/2020 to 5/5/2021



Source: Good Judgment Inc. Aggregation by T. Rowe Price. Optimistic is defined as before 1 July 2021. Pessimistic is defined as after 1 July 2021.

Equity Risk Premium

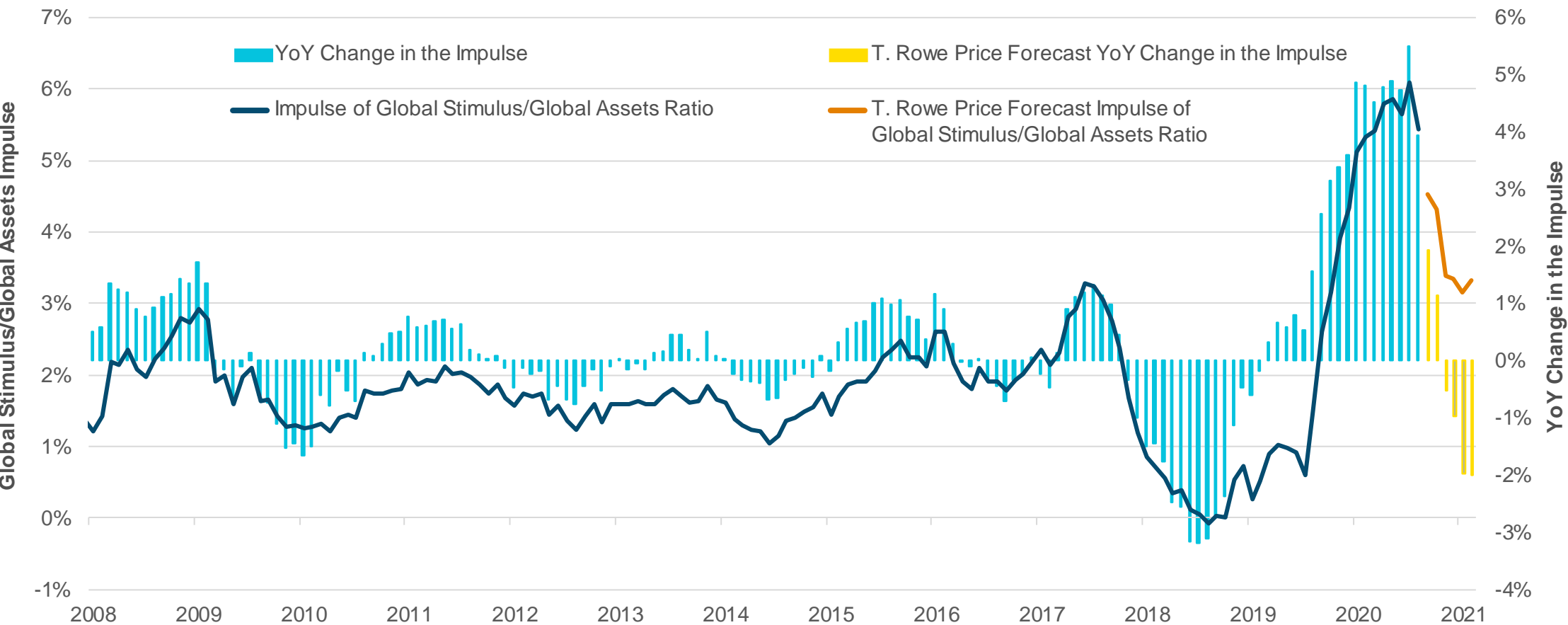
1/31/1990 to 4/30/2021



Past performance is not a reliable indicator of future performance.
Sources: Bloomberg Finance L.P., Standard & Poor's, T. Rowe Price analysis using data from FactSet Research Systems Inc. All rights reserved.

Global Stimulus

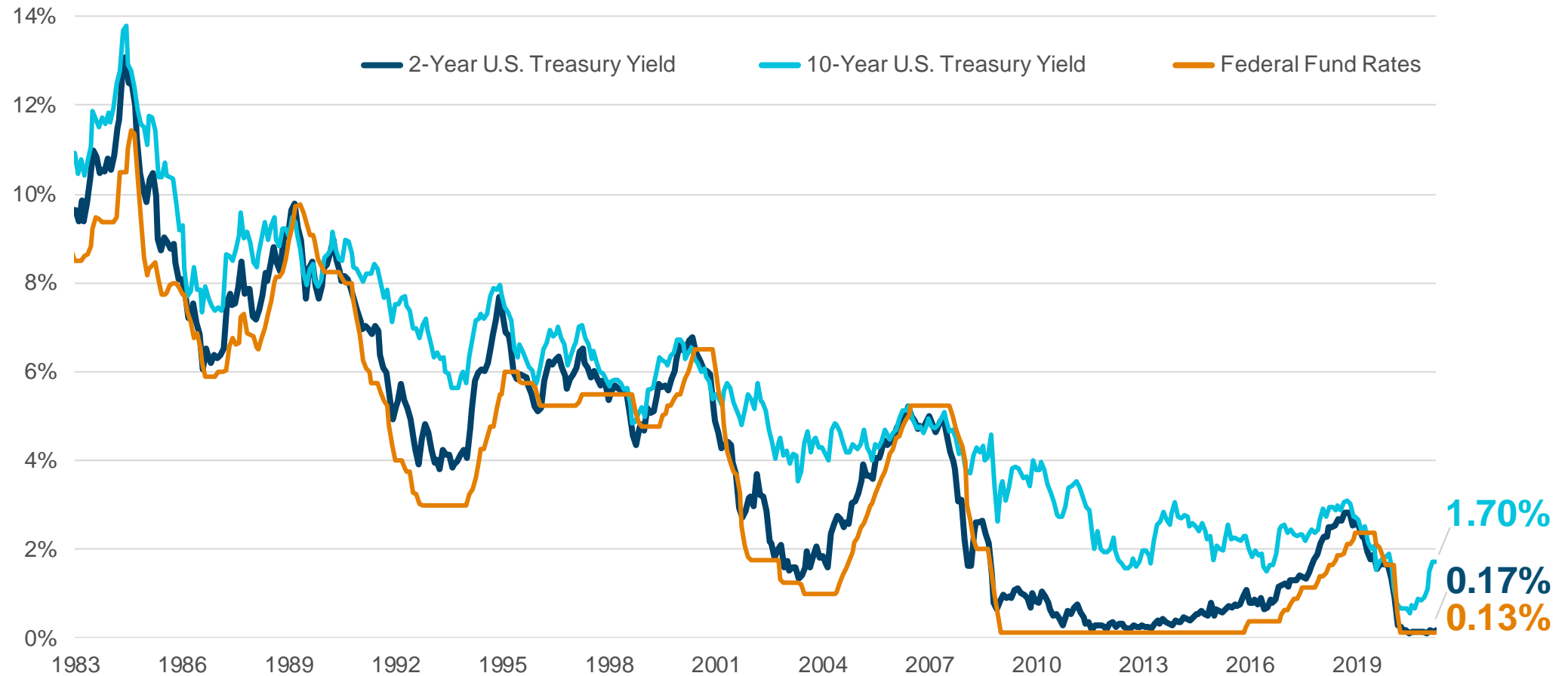
1/1/2006 to 3/31/2021, estimates from 4/30/2021 to 9/30/2021



Figures are in USD. Sources: Bloomberg Finance, L.P., U.S. Federal Reserve, ECB, BoJ, Bloomberg Index Services Limited.
Global Stimulus and Global Assets are calculated as: numerator = stimulus and denominator = assets. Numerator = 12m change in (U.S. Fed balance sheet + ECB balance sheet + BoJ balance sheet) + 12m rolling U.S. fiscal deficit + 12m change in Chinese banking system claims. Denominator = 12m average of (global equity market cap + Bank of International Settlements (BIS) total credit to the non-financial sector). Note that Bloomberg Barclays Global Aggregate Index is used where BIS data are not yet available.

Fed Funds vs. 2-Year and 10-Year Treasury Yields

1/1/1983 to 4/30/2021



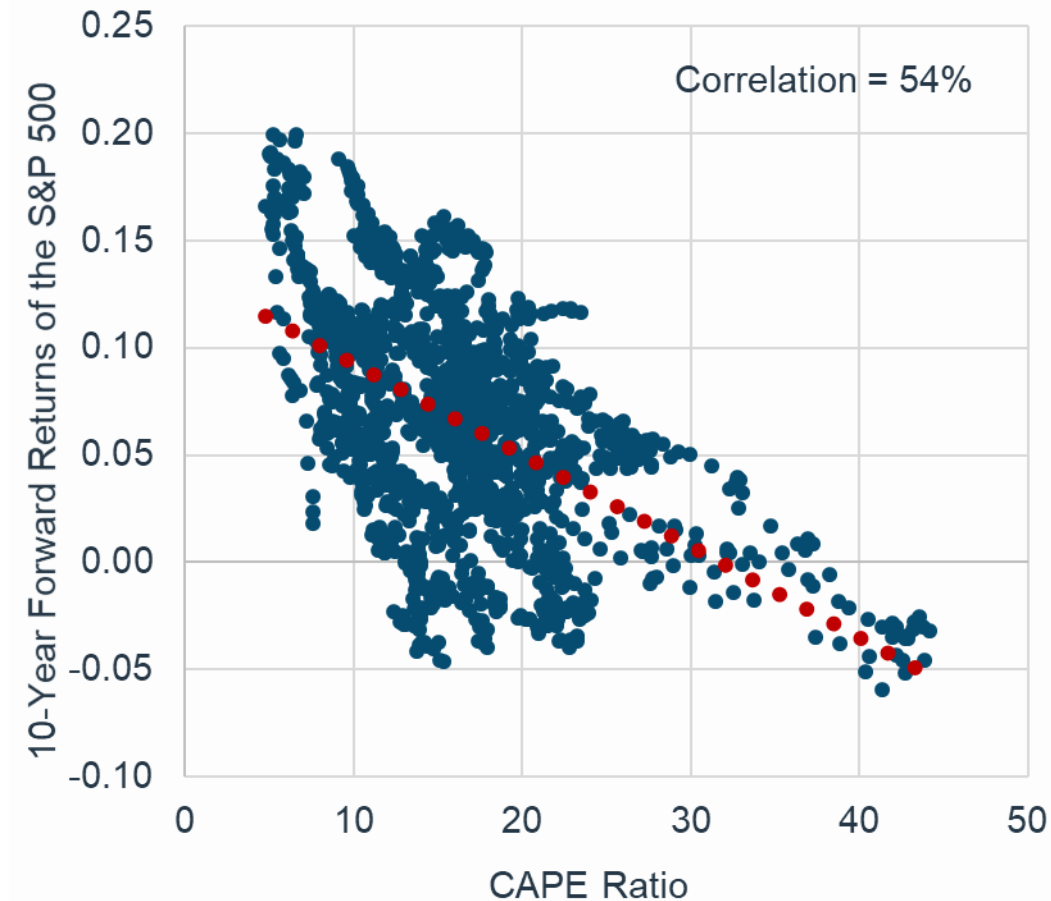
Past performance is not a reliable indicator of future performance.
Sources: Haver Analytics, Federal Reserve Board.

Long-Term Expected Returns

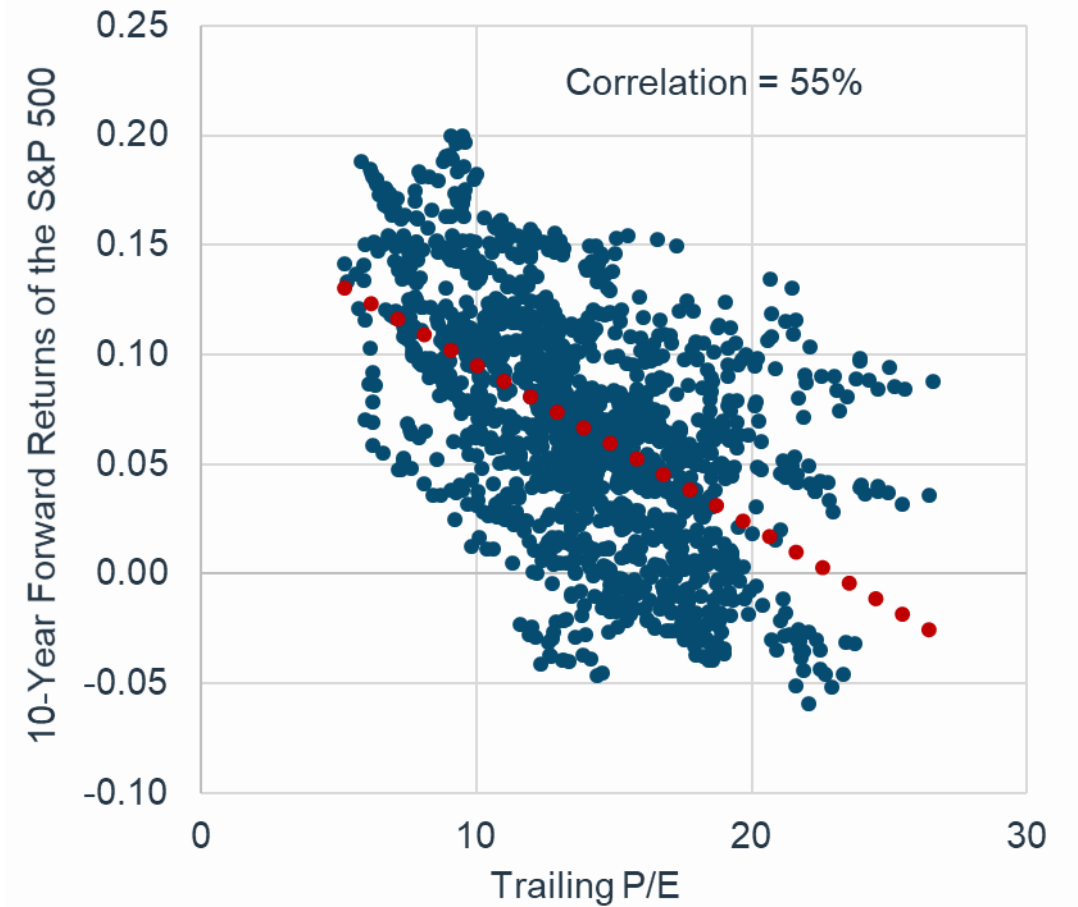


SAA Equity Forecast

Shiller CAPE



Siegel



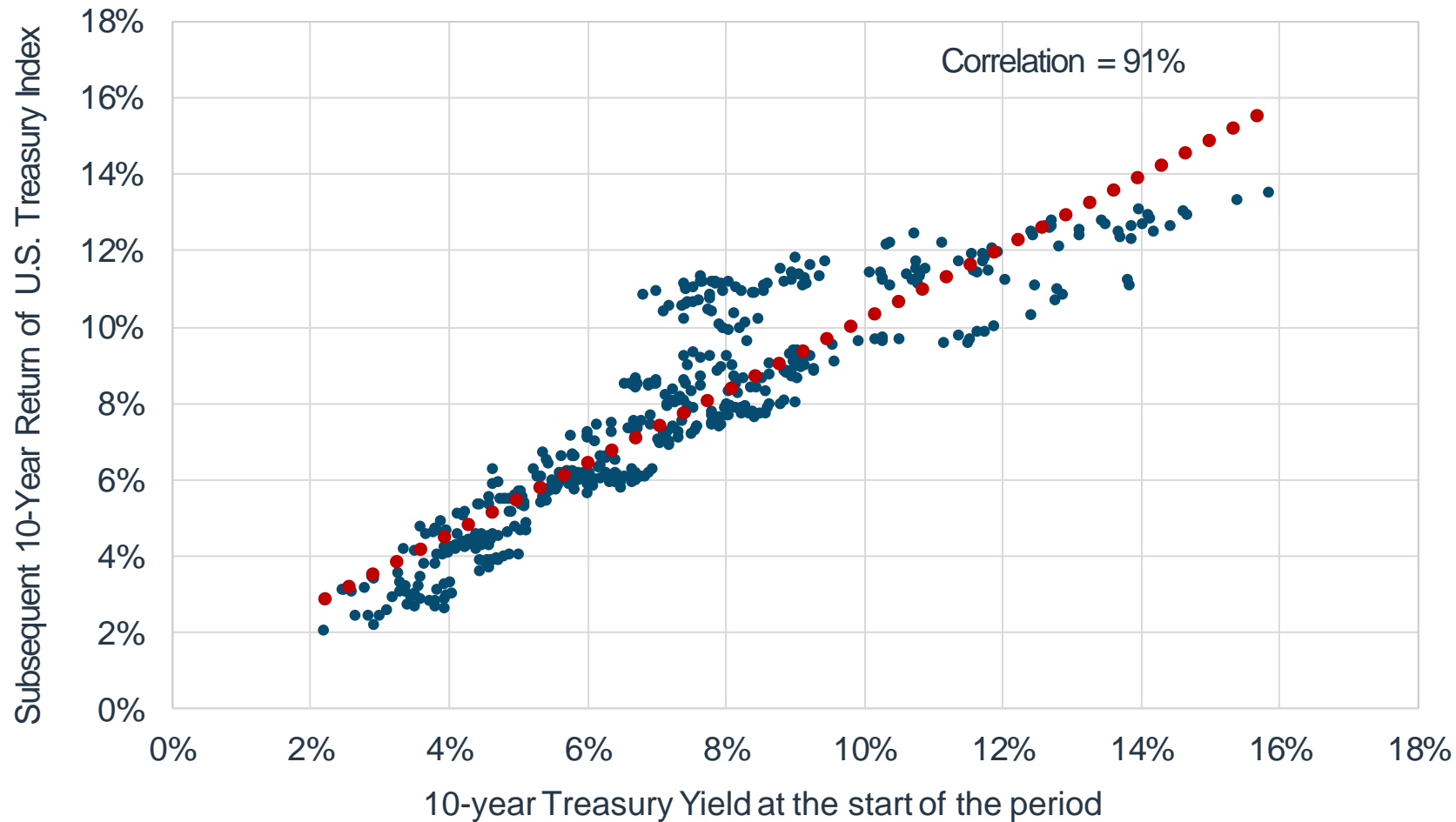
Replaced trailing earnings with 12-M forward earnings January 1990.

Past performance is not a reliable indicator of future performance.

For the period of January 1881 through March 2021. Figures calculated in U.S. Dollars.

Source: Robert Shiller data set, eon.yale.edu/~shiller/data.htm

U.S. 10-Year Treasury Bond Yield vs. Subsequent 10-Year Return of U.S. Treasury



Past performance is not a reliable indicator of future performance.

For the period of January 31, 1973 through July 30, 2010. Figures calculated in U.S. Dollars.

Source: Bloomberg Finance L.P.

Long-Run Return Forecasting

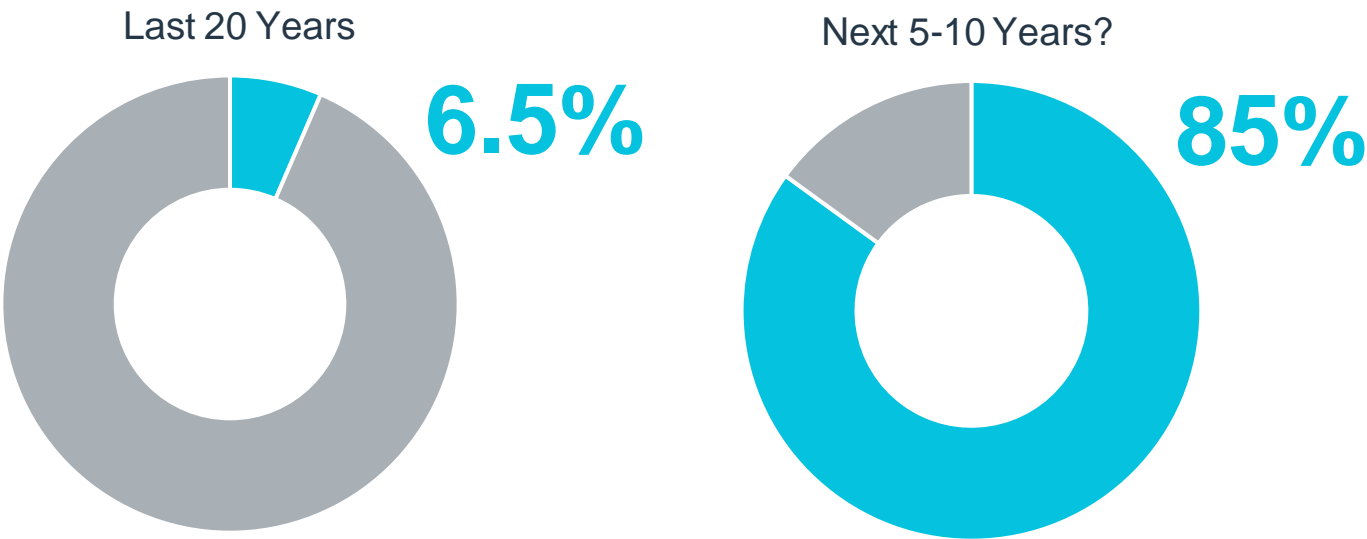
Example Using P/E Ratios

Stock Allocation Required for a Potential 6% Return

Stocks	Model	"Shiller CAPE"	Siegel
Inverse of P/E Ratio		1/35	1/20
Implied Yield		2.9%	5.0%
Inflation		2.2%	
Return		5.1%	7.2%
Probability		20%	80%
Expected Return		6.8%	

Bonds

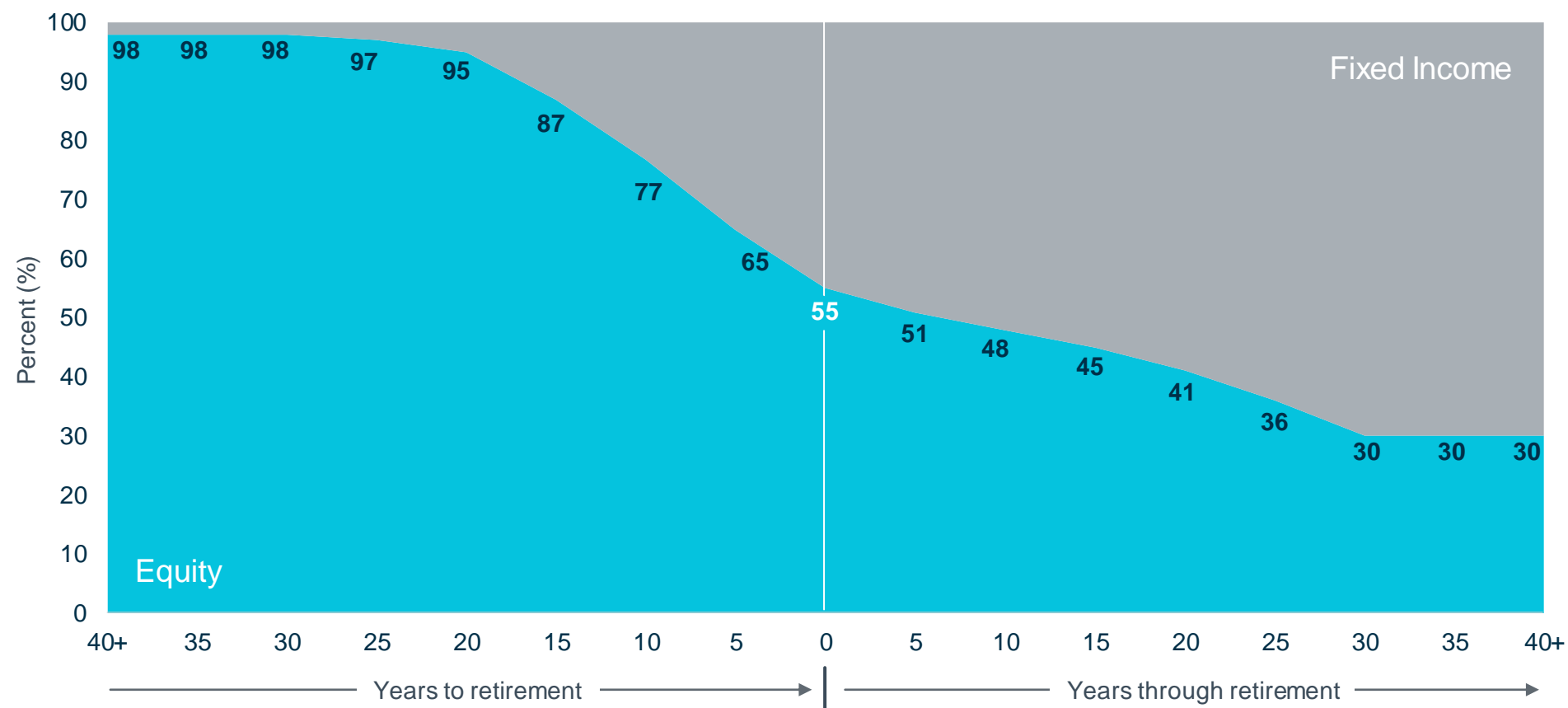
YTW	1.4%
-----	------



	Last 20 Years	Next 5-10 Years?
Stocks ¹	10.3%	6.8%
Bonds ²	5.7%	1.4%

ILLUSTRATIVE PURPOSES ONLY. There is no guarantee that any forecasts made will come to pass.
Shiller P/E: As of February 9, 2021. Source: multpl.com/shiller-pe. Siegel P/E: As of March 3, 2021. Source: Bloomberg, EST P/E Nxt Y.
Inflation assumption based on 10-year breakevens as of March 3, 2021. YTW is on the Bloomberg Barclays U.S. Aggregate Bond Index as of March 3, 2021.
Sources: Bloomberg Finance L.P., and Bloomberg Index Services Limited. Figures calculated in U.S. Dollars.
¹Source for historical total returns: S&P 500 Index
²Source for historical total returns: Bloomberg Barclays US Aggregate Bond Index

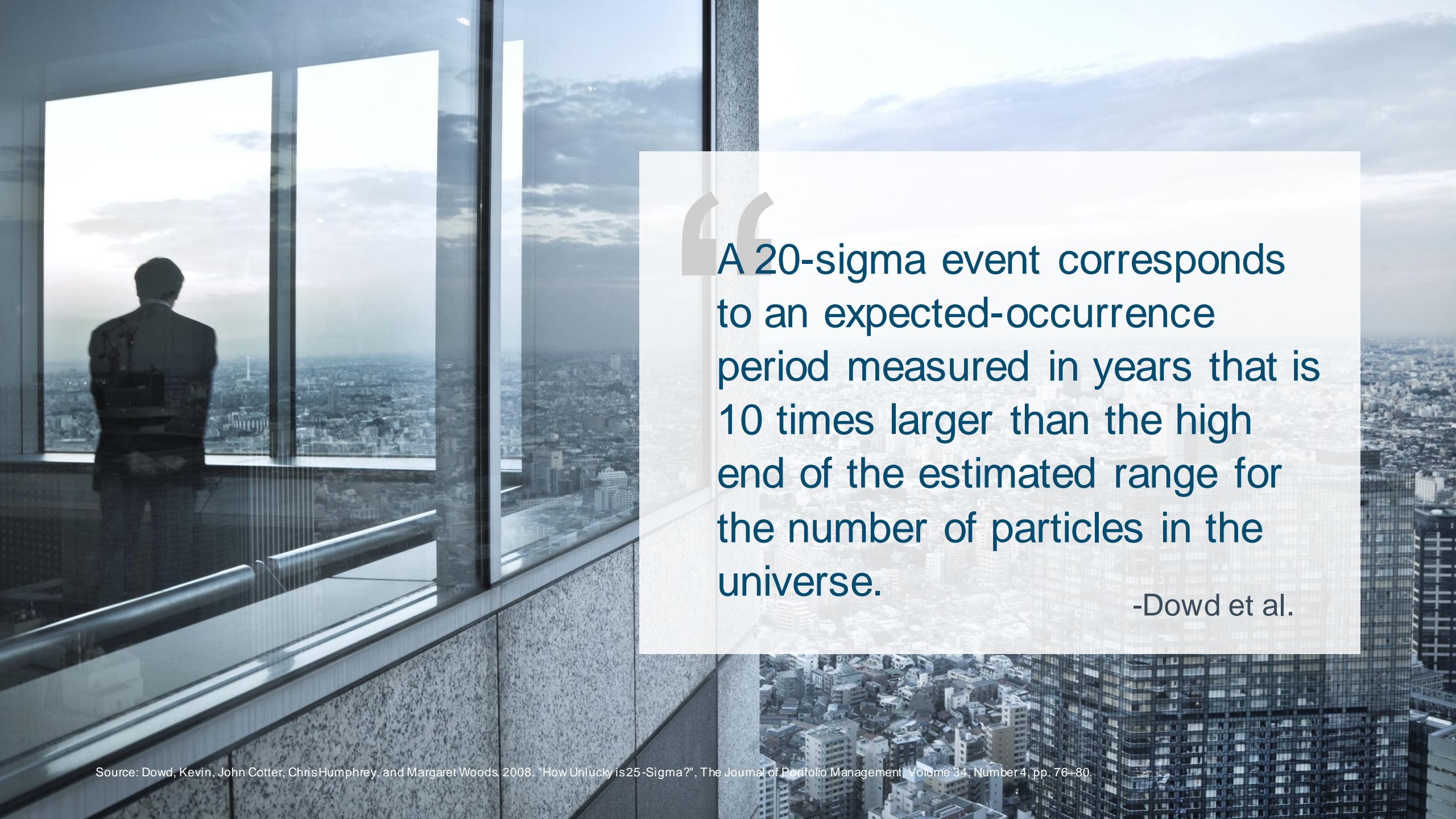
Target Date Glide Path



ILLUSTRATIVE PURPOSES ONLY.


When Diversification Fails





“A 20-sigma event corresponds to an expected-occurrence period measured in years that is 10 times larger than the high end of the estimated range for the number of particles in the universe.

-Dowd et al.

A low-angle, upward-looking photograph of several modern skyscrapers. The buildings feature glass facades and curved architectural elements, creating a sense of height and scale. The sky is a clear, vibrant blue. The image is used as a background for the slide.

1.94

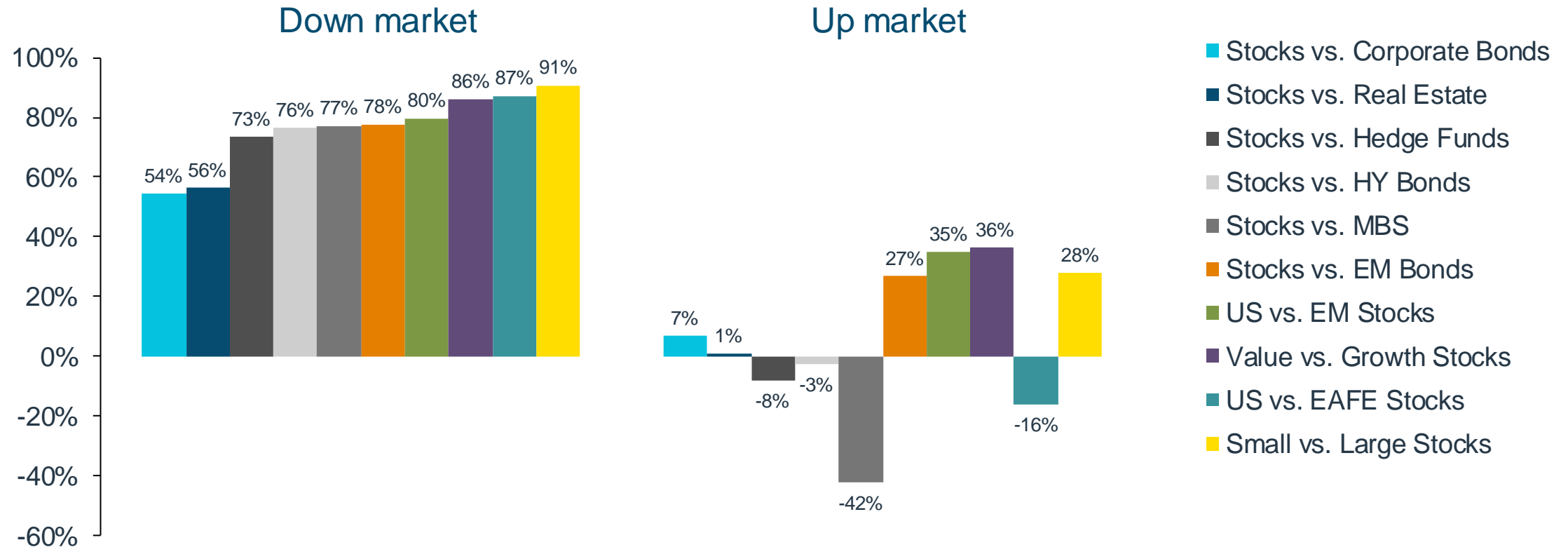
Sharpe Ratio of hypothetical
systematic strategy,
compared to 0.98 for the
S&P 500.

Based on an academic case study conducted by Andrew Lo and featured in the Financial Analysts Journal.

Lo, Andrew W. 2001. "Risk Management for Hedge Funds: Introduction and Overview", Financial Analysts Journal, Volume 57, Number 6, pp. 16 -33.

When Diversification Fails

Correlations for Key Asset Classes



Source: Financial Analysts Journal, "When Diversification Fails," Sebastien Page and Robert A. Panariello, Third Quarter 2018 Issue, Vol. 74, Number 3. Data as of June 2017. Monthly data, with start dates based on availability – see paper for start dates and data sources. Left tail and right tail correlations are at the 1st and 99th percentiles, but are adjusted using the data-augmentation methodology. Full correlation profiles (adjusted, unadjusted, and normal) are shown in the paper.

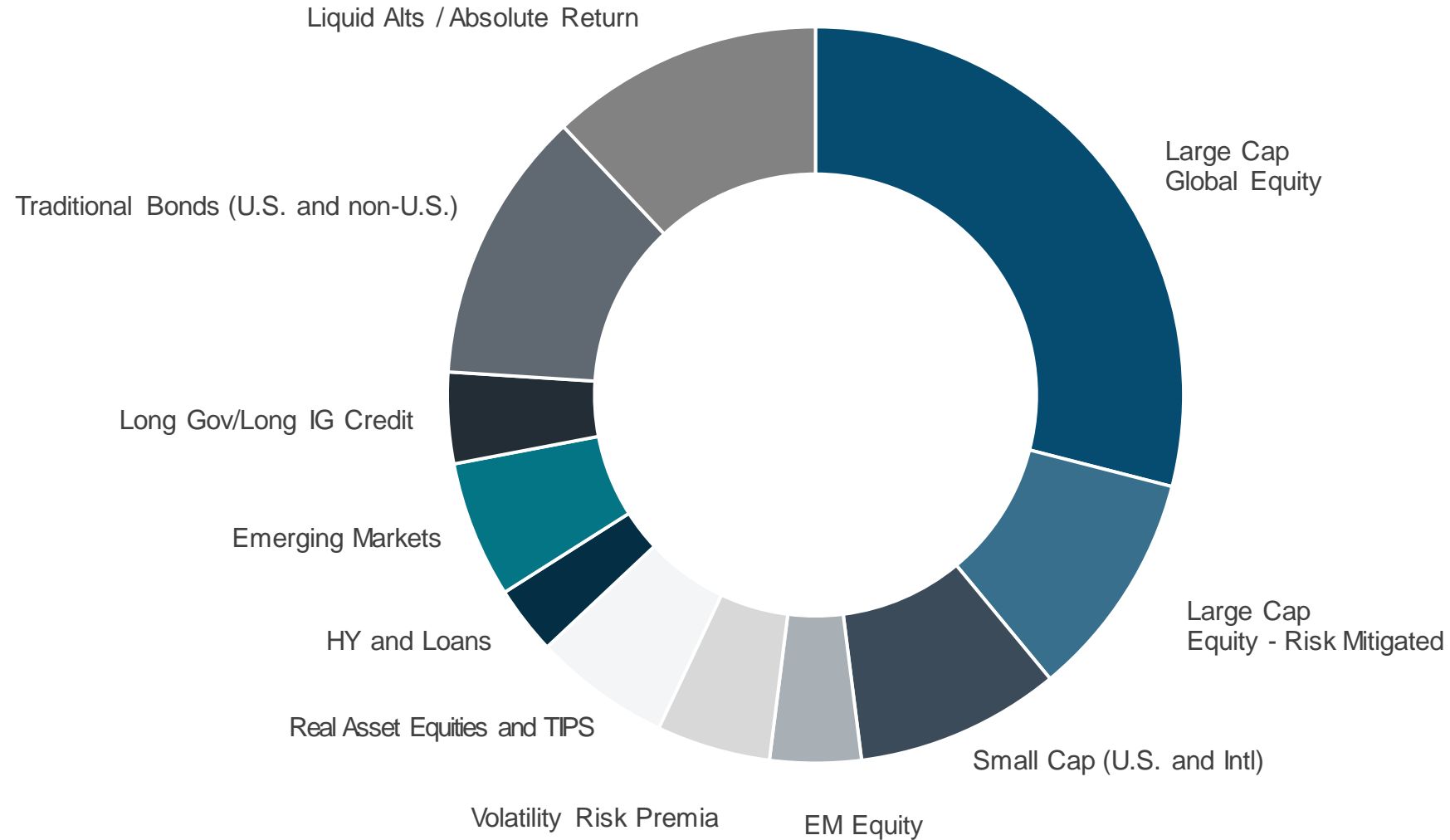
Access the full publication on the CFA Institute website at <https://www.cfapubs.org/doi/pdf/10.2469/faj.v74.n3.full>

Sources: MSCI, Russell, Bloomberg Index Services Limited, NAREIT, and HFRI (see Additional Disclosures)

Modernized 60/40



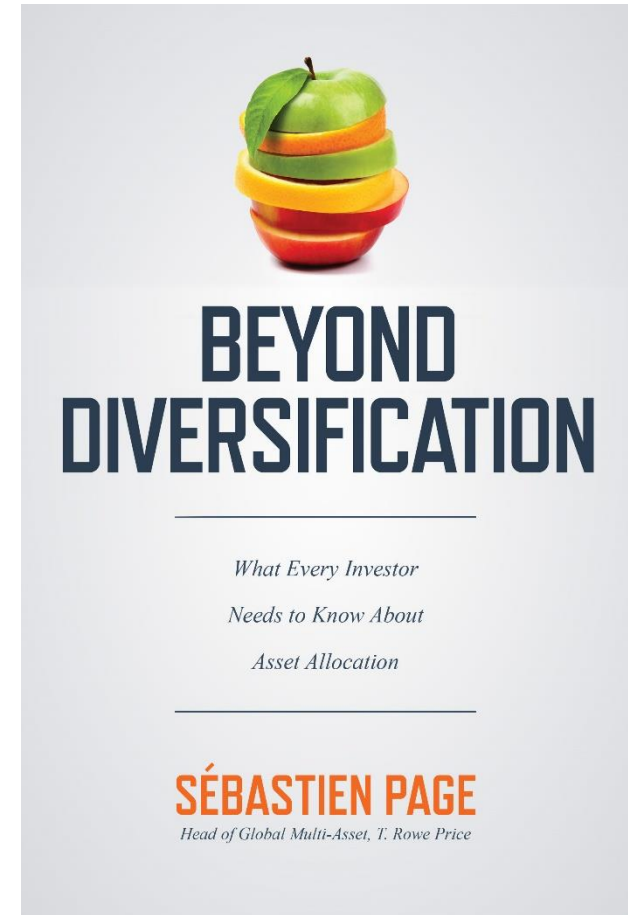
Modernized 60/40 Approach



Provided for informational purposes only. This material is not intended to be a recommendation or advice to undertake any investment action, as each investor's portfolio is built on many custom inputs, including individual circumstances, investment objectives and risk tolerance.

For more on my views on these topics, see **Beyond Diversification: What Every Investor Needs to Know About Asset Allocation**, McGraw Hill, 2020.

Proceeds from book sales are donated to the **T. Rowe Price Foundation**, working to alleviate poverty in Baltimore and other cities where T. Rowe Price does business around the world.



Additional Disclosures

Source: MSCI. MSCI and its affiliates and third party sources and providers (collectively, "MSCI") makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This report is not approved, reviewed, or produced by MSCI. Historical MSCI data and analysis should not be taken as an indication or guarantee of any future performance analysis, forecast or prediction. None of the MSCI data is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such.

Bloomberg Index Services Limited. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively "Bloomberg"). BARCLAYS® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates, "Barclays"), used under license. Bloomberg or Bloomberg's licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays approves or endorses this material, or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

The "S&P 500 Index" is a product of S&P Dow Jones Indices LLC, a division of S&P Global, or its affiliates ("SPDJ") and has been licensed for use by T. Rowe Price. Standard & Poor's® and S&P® are registered trademarks of Standard & Poor's Financial Services LLC, a division of S&P Global ("S&P"); Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC ("Dow Jones"). This product is not sponsored, endorsed, sold or promoted by SPDJI, Dow Jones, S&P or their respective affiliates, and none of such parties make any representation regarding the advisability of investing in such product(s) nor do they have any liability for any errors, omissions, or interruptions of the S&P 500 Index.

FTSE is a trade mark of the LSE Group and is used by FTSE International Limited ("FTSE") under license. "NAREIT" is a trade mark of the Nareit. All rights in the FTSE Nareit All Equity REITs Index (the "Index") vest in FTSE and Nareit. Neither FTSE, nor the LSE Group, nor Nareit accept any liability for any errors or omissions in the indexes or data and no party may rely on any indexes or data contained in this communication. No further distribution of data from the FTSE or Nareit is permitted without FTSE's express written consent. FTSE, the LSE Group, and Nareit do not promote, sponsor or endorse the content of this communication.

All data and content on the HFR website and in the HFR Database products are for your informational and personal use only. The total return data provided on the HFR website, the HFR Database products, and the reports generated from them are for internal, non-commercial use only. The data is not sufficient, comprehensive enough or approved for use in connection with investment products or instruments. You may not copy, redistribute, sell, retransmit, or make the data available to a third party, or otherwise use it for any commercial or public purpose unless you have a separate written agreement with HFR. You require a written license from HFR to use the HFR data, HFR marks and names and/or HFR Index names, including but not limited to use in connection with investment products and instruments (regardless of whether such products or instruments are based on, linked to or track an HFR Index), the name of investment products and instruments, in prospectuses, marketing and other materials publicly or commercially disseminated, benchmarking purposes, and any SEC, government or regulatory filings. Please contact HFR for additional information at: INDICES@HFR.COM

London Stock Exchange Group plc and its group undertakings (collectively, the "LSE Group"). © LSE Group 2019. FTSE Russell is a trading name of certain of the LSE Group companies. Russell® is a trade mark of the relevant LSE Group companies and is used by any other LSE Group company under license. All rights in the FTSE Russell indexes or data vest in the relevant LSE Group company which owns the index or the data. Neither LSE Group nor its licensors accept any liability for any errors or omissions in the indexes or data and no party may rely on any indexes or data contained in this communication. No further distribution of data from the LSE Group is permitted without the relevant LSE Group company's express written consent. The LSE Group does not promote, sponsor or endorse the content of this communication.

Data Sources - Page 14

The conditional correlations shown were based on the following asset classes, indexes, and data series start dates. U.S. Stocks/Large Stocks: MSCI USA Index, January 1970; Developed Markets (EAFE) Stocks: MSCI EAFE Index (Local), January 1970; Emerging Markets (EM) Stocks: MSCI Emerging Markets Index (Local), January 1988; Growth Stocks: Russell 1000 Growth Index, February 1978; Small Stocks: Russell 2000 Index, February 1978; Corporate Bonds: Bloomberg Barclays U.S. Corporate Index, August 1988; Mortgage Backed Securities: Barclays U.S. MBS Index, August 1988; High Yield (HY) Bonds: Bloomberg Barclays U.S. High Yield Index, August 1988; Emerging Market (EM) Bonds: Bloomberg Barclays Emerging Markets Bond Index, August 1988; Real Estate: NAREIT All Equity Index, January 1972; Hedge Funds: HFRI Global Hedge Funds Index, January 1988.

(Growth Stocks were conditioned against Value Stocks (represented by the Russell 1000 Value Index).

Important Information

This material is being furnished for general informational and/or marketing purposes only. The material does not constitute or undertake to give advice of any nature, including fiduciary investment advice, nor is it intended to serve as the primary basis for an investment decision. Prospective investors are recommended to seek independent legal, financial and tax advice before making any investment decision. T. Rowe Price group of companies including T. Rowe Price Associates, Inc. and/or its affiliates receive revenue from T. Rowe Price investment products and services. **Past performance is not a reliable indicator of future performance.** The value of an investment and any income from it can go down as well as up. Investors may get back less than the amount invested.

The material does not constitute a distribution, an offer, an invitation, a personal or general recommendation or solicitation to sell or buy any securities in any jurisdiction or to conduct any particular investment activity. The material has not been reviewed by any regulatory authority in any jurisdiction.

Information and opinions presented have been obtained or derived from sources believed to be reliable and current; however, we cannot guarantee the sources' accuracy or completeness. There is no guarantee that any forecasts made will come to pass. The views contained herein are as of the date noted on the material and are subject to change without notice; these views may differ from those of other T. Rowe Price group companies and/or associates. Under no circumstances should the material, in whole or in part, be copied or redistributed without consent from T. Rowe Price.

USA - Issued in the USA by T. Rowe Price Associates, Inc., 100 East Pratt Street, Baltimore, MD, 21202, which is regulated by the U.S. Securities and Exchange Commission.

©2021 T. Rowe Price. All rights reserved. T. ROWE PRICE, INVEST WITH CONFIDENCE, and the Bighorn Sheep design are, collectively and/or apart, trademarks of T. Rowe Price Group, Inc.

202105 - 1642816