

What to do When an Investment Strategy Performs Poorly

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Investment Principles

- Markets are highly efficient.
- All risky assets should have similar risk-adjusted returns, similar Sharpe ratios.*
- Portfolios should be broadly diversified across unique/independent sources of risk.
 - Traditional portfolios are dominated by single risk.

*The Sharpe Ratio is a measure of the risk-adjusted return of an investment. A higher ratio indicates a greater return for a unit of risk. The Sharpe Ratio is calculated as the average annual portfolio return less the average annual risk-free rate (one-month T-bills) divided by the portfolio's annualized standard deviation.

Beta Dominates the Risk of the Typical Portfolio

- Typical Portfolio: 60% Stocks/40% Bonds
- Equity Volatility 20%
- Bond Portfolio (4-5 Year Average Maturity) Volatility 5%
- Equity Risk: $60 \times 20 = 1200$ + Bond Risk: $40 \times 5 = 200$
- Total Risk: $1200 + 200 = 1400$
- Percentage Equity Risk: $1200/1400 = 86\%$

For informational and educational purposes only. The information contained is not intended to be a substitute for specific individualized financial advice. Investing involves risk, including loss of principle. No strategy assures success or protects against loss.

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**“Diversification for investors,
like celibacy for teenagers, is a
concept both easy to understand
and hard to practice.”**

– James Gipson

S&P Underperformed One-Month Treasury Bills

15 Years

1929-1943

17 Years

1966-1982

13 years

2000-2012

Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results.

Forward-Looking Odds of a Negative Return (%)

	1-Year	3-Year	5-Year	10-Year	20-Year
Beta	34	24	18	10	3
Size	41	34	30	23	15
Value	37	28	23	15	7
Momentum	28	15	9	3	0
Profitability*	36	27	22	14	6
Quality**	31	19	13	6	1
P1	23	11	5	1	0
P2*	18	5	2	0	0
P3**	13	2	1	0	0

Data for Market (Beta), Size, Value, Momentum, and Profitability is based on annual premiums from the Ken French Data Library. Quality is based on monthly data from AQR, and compounded to approximate an annual premium. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends. See "Portfolio Factor Allocations" slide for constructions. *1964-2018 & **1958-2018 time frames are used for P2 & P3 respectively due to availability of data. Odds of underperformance assume a normal distribution.

A strategy should be judged in terms of its quality and prudence before, not after, its outcome is known.

-Nassim Nicholas Taleb, Fooled by Randomness

Confusing Strategy with Outcome

2008-2020 Provides Test

Fund	2008-2020 Annualized Return (%)
Domestic	
Vanguard 500 Index (VFIAX)	9.7
Vanguard Value Index (VVIAX)	7.5
Vanguard Small Cap Index (VSMAX)	10.0
Vanguard Small Cap Value Index (VISVX)	8.4
International	
Vanguard Developed Markets Index (VTMGX)	2.9
Vanguard Emerging Markets Index (VEIEX)	2.2

Data from www.portfoliovisualizer.com

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The Good Side of Tracking Variance

Fund	2000-2007 Annualized Return (%)
Domestic	
Vanguard 500 Index (VFIAX)	3.3
Vanguard Value Index (VVIAX)	4.9
Vanguard Small Cap Index (VSMAX)	8.9
Vanguard Small Cap Value Index (VISVX)	10.0
International	
Vanguard Developed Markets Index (VTMGX)	8.3
Vanguard Emerging Markets Index (VEIEX)	22.9

Data from www.portfoliovisualizer.com

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The Bad Side of Tracking Variance

Fund	1995-1999 Annualized Return (%)
Domestic	
Vanguard 500 Index (VFIAX)	28.5
Vanguard Value Index (VVIAX)	22.8
Vanguard Small Cap Index (NAESX)	17.8
International	
MSCI EAFE Index (Gross Dividends)	13.2
MSCI Emerging Markets Index (Gross Dividends)	2.0

Data from www.portfoliovisualizer.com

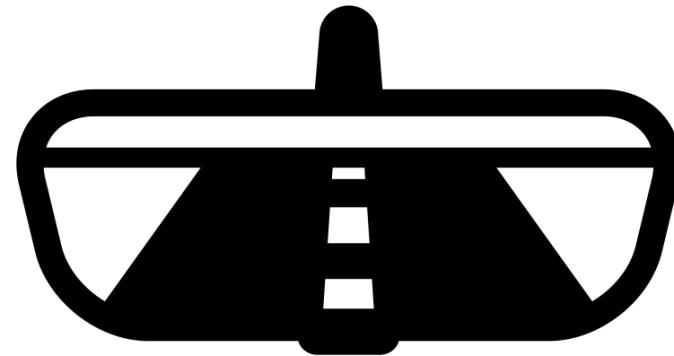
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Relativism and Recency: The Enemy of Investors



Relativism

The performance of a portfolio relative to some index.



Recency

Focusing on the most recent returns, projecting them into the future, while ignoring long-term historical evidence.

Valuations: The Best Predictor of Long-Term Returns

Shiller CAPE 10 Earnings Yield: March 2021

U.S.
2.8

EAFE
5.3

Emerging Markets
7.2

Valuations: The Best Predictor Returns

Price-to-Earnings Ratios: March 2021

U.S. Stocks
21.4

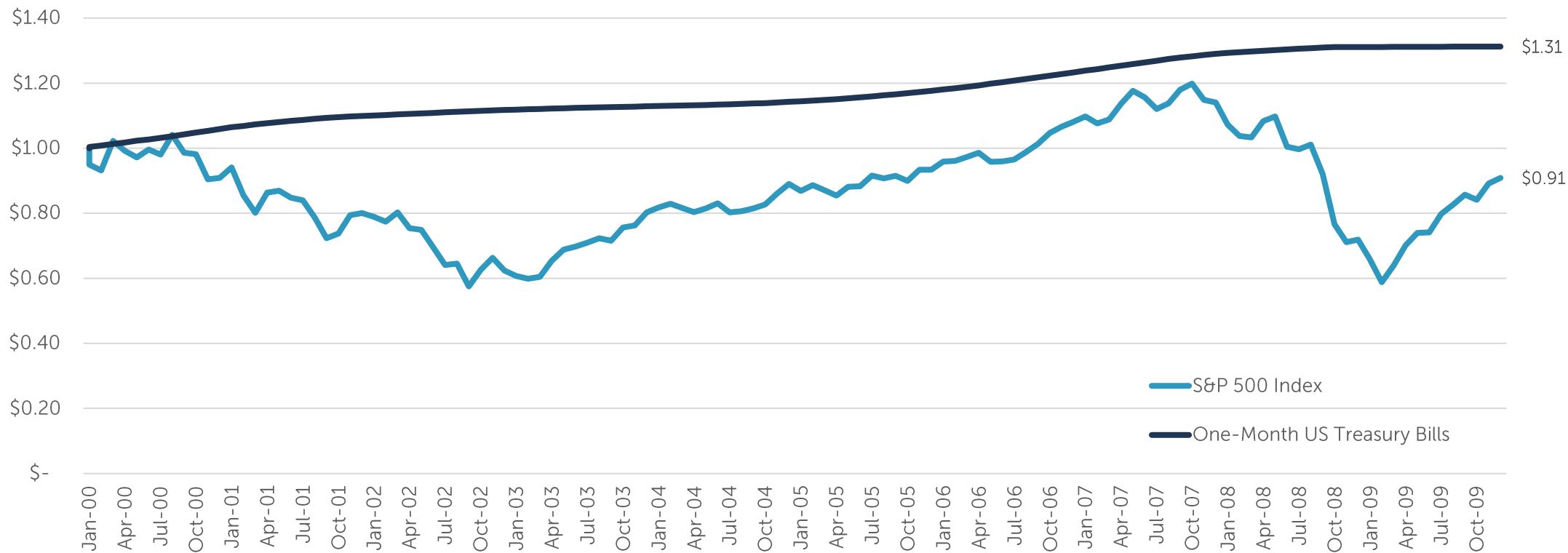
International Stocks
16.2

Emerging Markets
Stocks
15.3

Data from Morningstar as of 9/30/2019. U.S. Stocks represented by Vanguard U.S. Total Stock Market Index Fund. International Stocks represented by Vanguard FTSE Developed Markets Index Fund. Emerging Markets Stocks represented by Vanguard Emerging Markets Index Fund. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

Impatience

Hypothetical Growth of \$1: January 2000 to October 2009

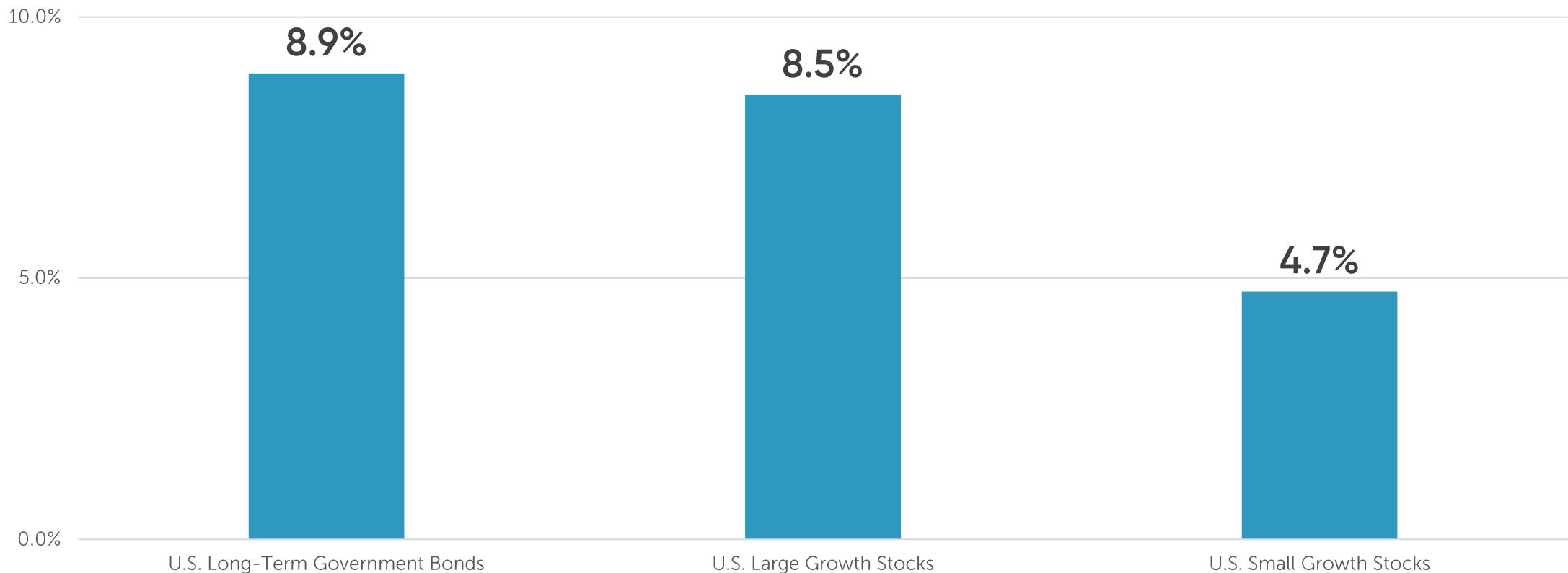


Data from Morningstar as of 6/30/2019

Hypothetical value of \$1 invested at the beginning of 2000 and kept invested through October 2009. Assumes reinvestment of income and no transaction costs or taxes. This is for illustrative purposes only and not indicative of any investment. Total returns in U.S. dollars. Past performance is no guarantee of future results. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

Impatience (continued)

Annualized Return: January 1969 to December 2008



Data from Morningstar. U.S. Long-Term Government Bonds are U.S. 20-year government bonds. U.S. Large Growth Stocks are Fama/French U.S. Large Growth Research index. U.S. Small Growth Stocks are Fama/French U.S. Small Growth Research Index. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

How Long Is Enough to Determine if Strategy Works?

To Have Confidence a Strategy Must Have Evidence of Premium and:

Persistence

over long periods of time and across economic regimes

Pervasiveness

across sectors, countries, geographic regions and even asset classes

Robustness

to various definitions

Implementability,

surviving transactions costs

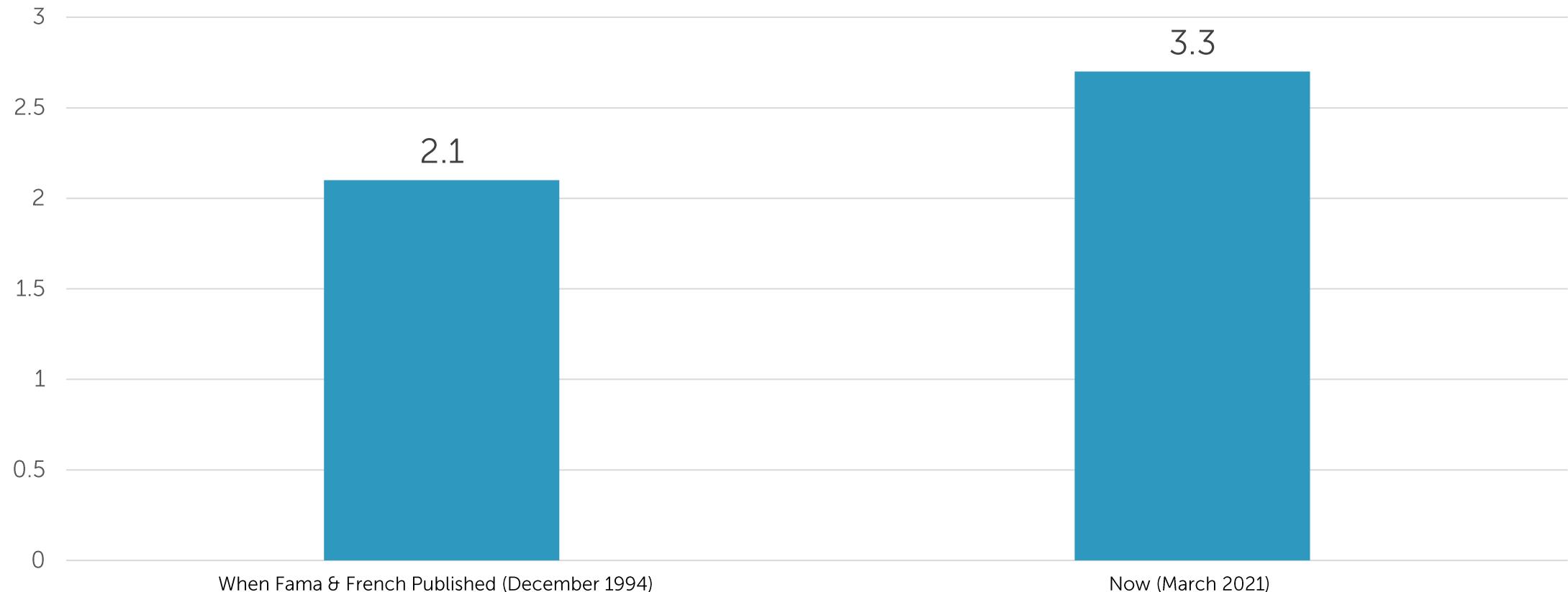
Intuitive

risk- or behavioral- based explanations

Data from Morningstar as of 6/30/2019

Has Value Become Overcrowded?

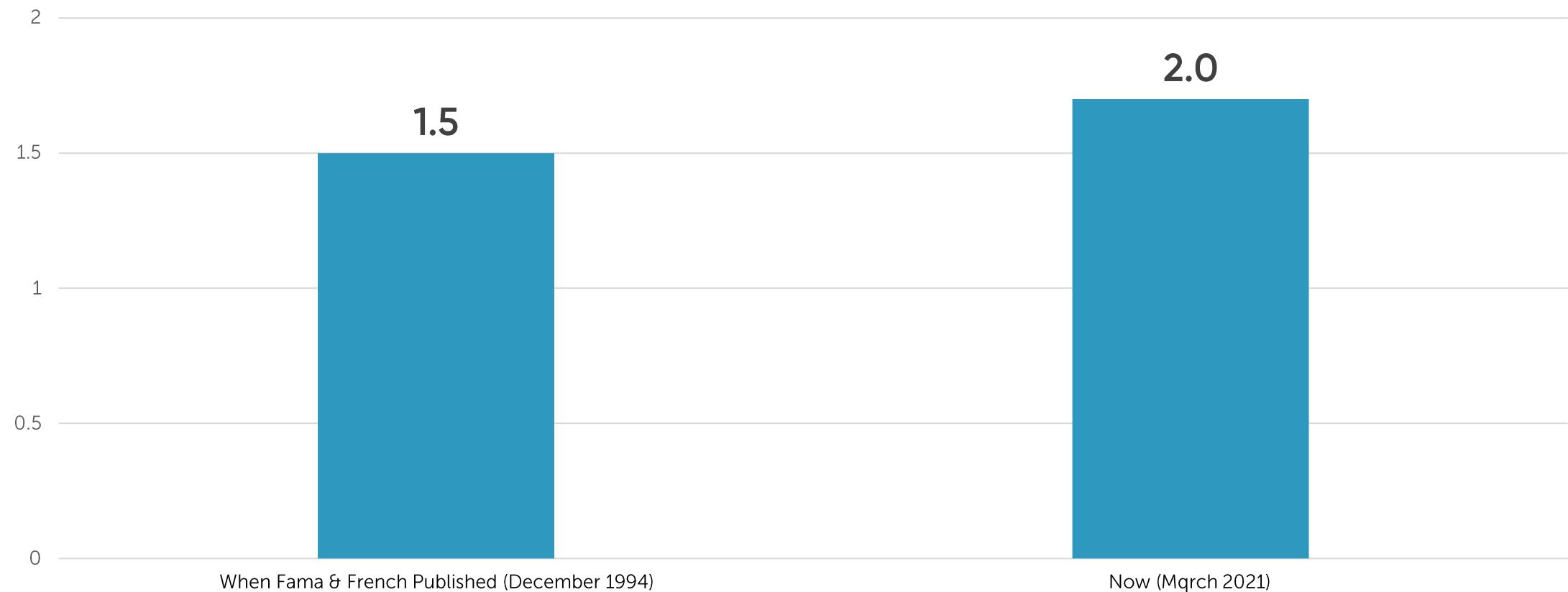
Relative Price-to-Book Ratio: U.S. Large Growth v. U.S. Large Value



Sources: Dimensional & Morningstar. Now (October 2020) calculated by comparing the P/B ratio of Vanguard Growth Index Fund (VUG) (7.7 to the P/B ratio of Vanguard Value Index Fund (VTY) (2.3). Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

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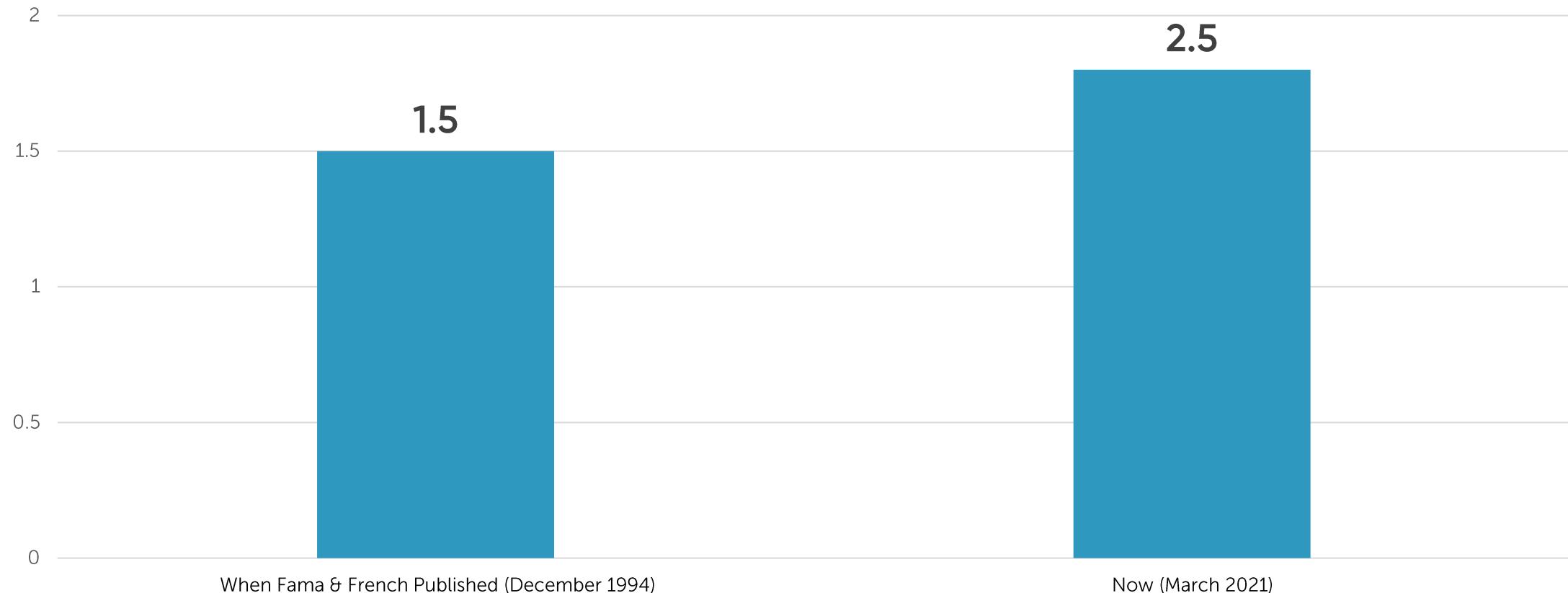
Relative Price-to-Earnings Ratio: U.S. Large Growth v. U.S. Large Value



Sources: Dimensional & Morningstar. Now (September 2020) calculated by comparing the P/E ratio of Vanguard Growth Index Fund (31.6) to the P/E ratio of Vanguard Value Index Fund (16.2). Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

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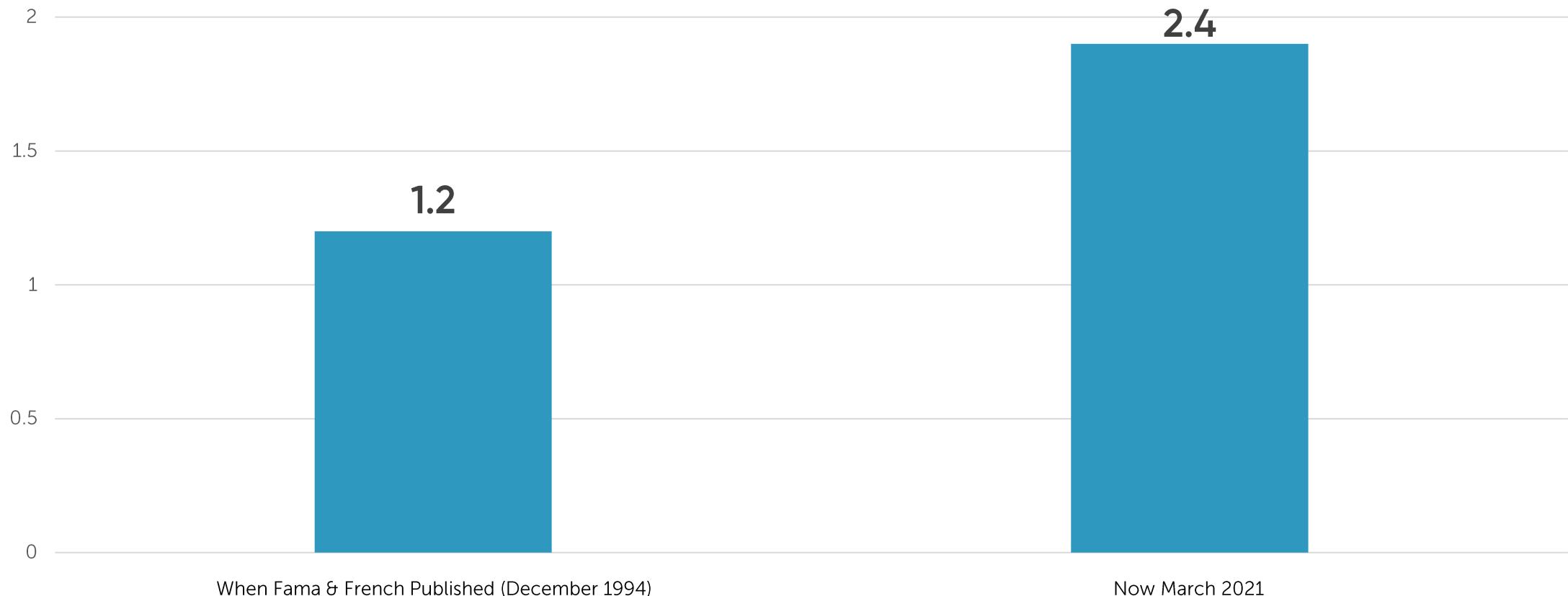
Relative Price-to-Book Ratio: U.S. Small Growth v. U.S. Small Value



Sources: Dimensional & Morningstar. Now (March 2021) calculated by comparing the P/B ratio of Vanguard Small Growth Index Fund (VBK) (4.5) to the P/B ratio of Vanguard Small Value Index Fund (VBR) (1.8). Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

Has Value Become Overcrowded?

Relative Price-to-Earnings Ratio: U.S. Small Growth v. U.S. Small Value



Sources: Dimensional & Morningstar. Now (October 2020) calculated by comparing the P/E ratio of Vanguard Small Growth Index Fund (VBK) (32.6) to the P/E ratio of Vanguard Small Value Index Fund (VBR) (13.7). Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends.

Core Investment Strategy Principles

- Market highly efficient
- All risky assets should have similar risk-adjusted returns
- Portfolios should be broadly diversified across unique/independent sources of risk

Sources:

*Dimensional

**Morningstar

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“Individual decisions can be badly thought through, and yet be successful, or exceedingly well thought through, but be unsuccessful, because the recognized possibility of failure in fact occurs. But over time, more thoughtful decision-making will lead to better results, and more thoughtful decision-making can be encouraged by evaluating decisions on how well they were made rather than on outcome.”

– Robert Rubin,
Former co-chairman of Goldman Sachs

Important Disclosures

Sources: Dimensional Fund Advisors and Morningstar

The contents of this presentation are for informational and educational purposes only and should not be construed as specific investment, tax, accounting, or legal advice. Individuals should seek advice from independent professional based on their individual circumstances.

The analysis contained in this presentation is based upon the information and data available at the time but may become outdated or superseded at any time without notice. Information in this presentation are based upon third party information and are deemed to be reliable, however its accuracy and completeness cannot be guaranteed.