Valuations Matter

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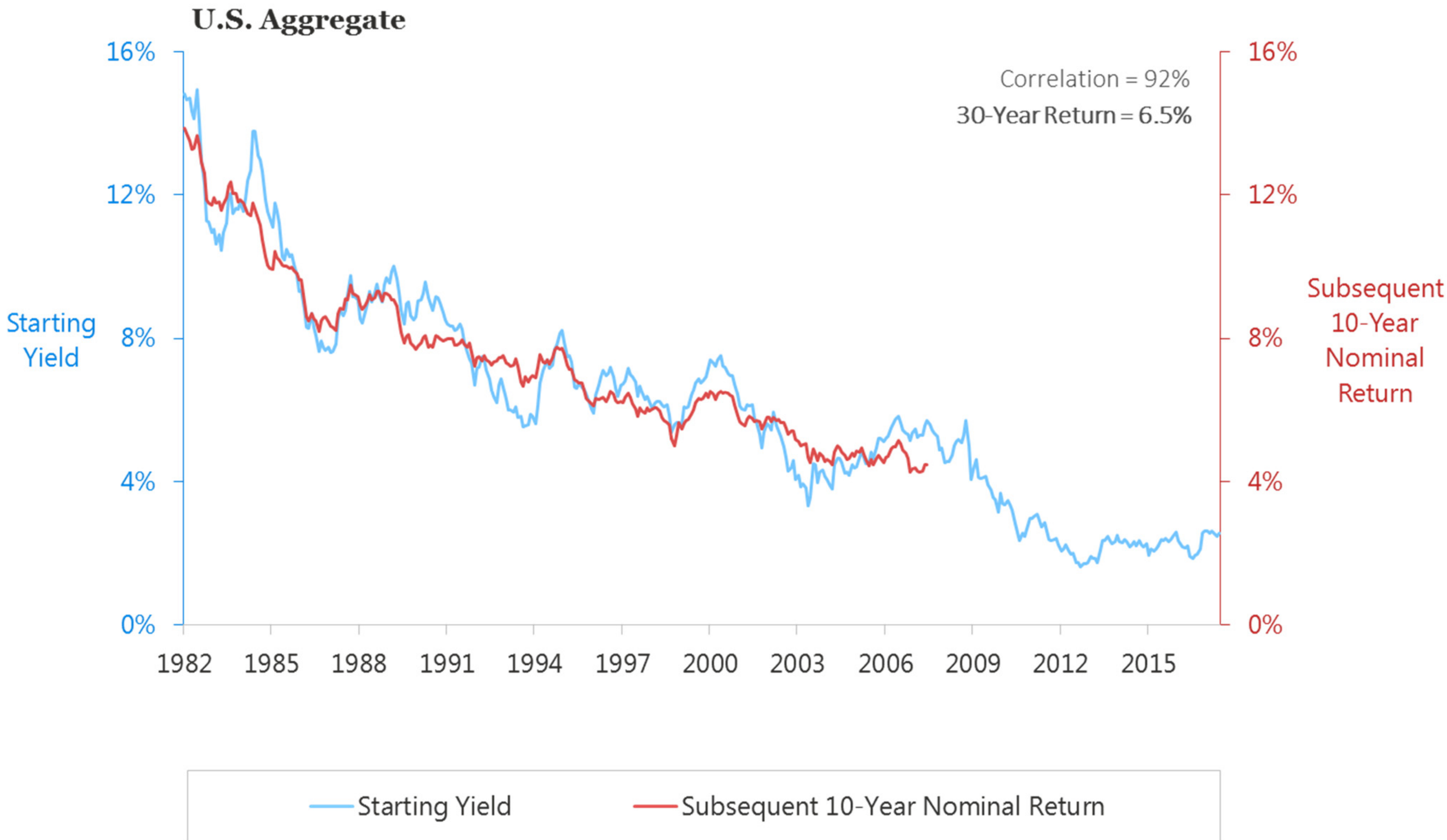
research affiliates™

Prelude – The Impact of Valuations on Asset Classes

Bonds: Past Is Not Prologue

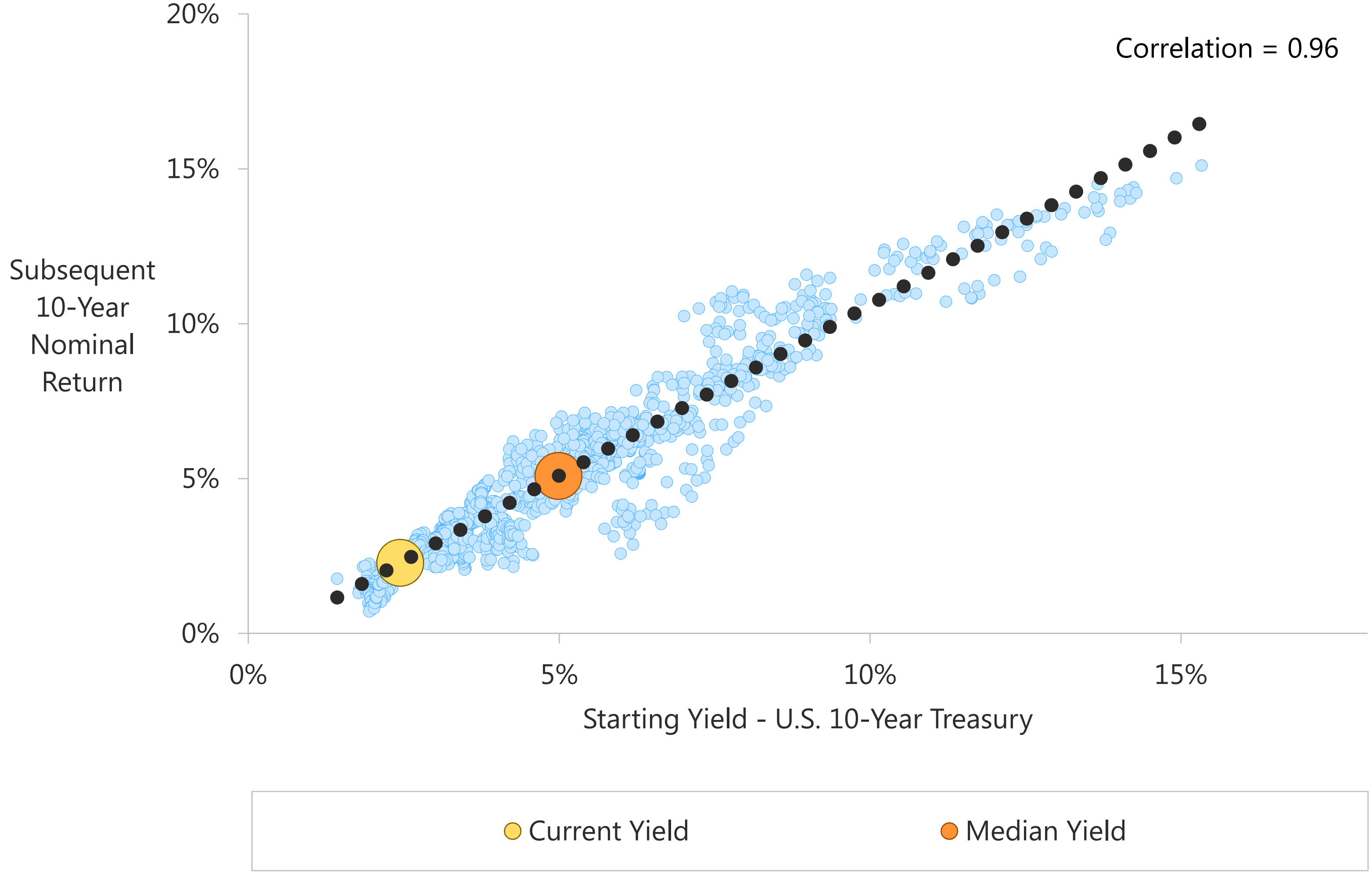
United States as of June 30, 2017



Source: Research Affiliates, LLC, based on data from Barclays. The yield-to-worst and total returns are of the Barclays Aggregate Index.

Bonds: Future Returns Follow Starting Yields

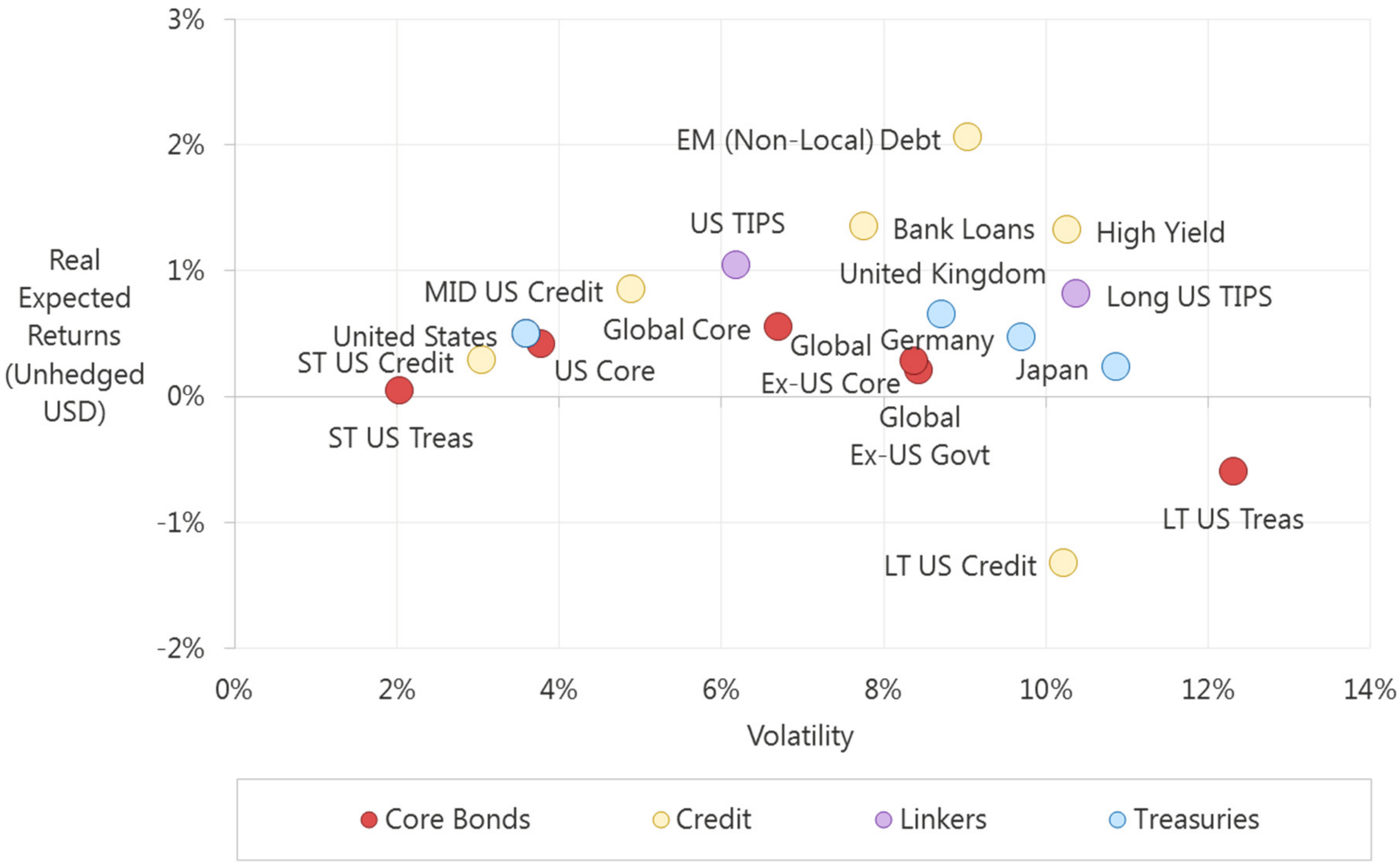
United States, January 1800–2016



Source: Research Affiliates, LLC, based on data from Ibbotson and Bloomberg.

Bonds: Long-Term Return Expectations

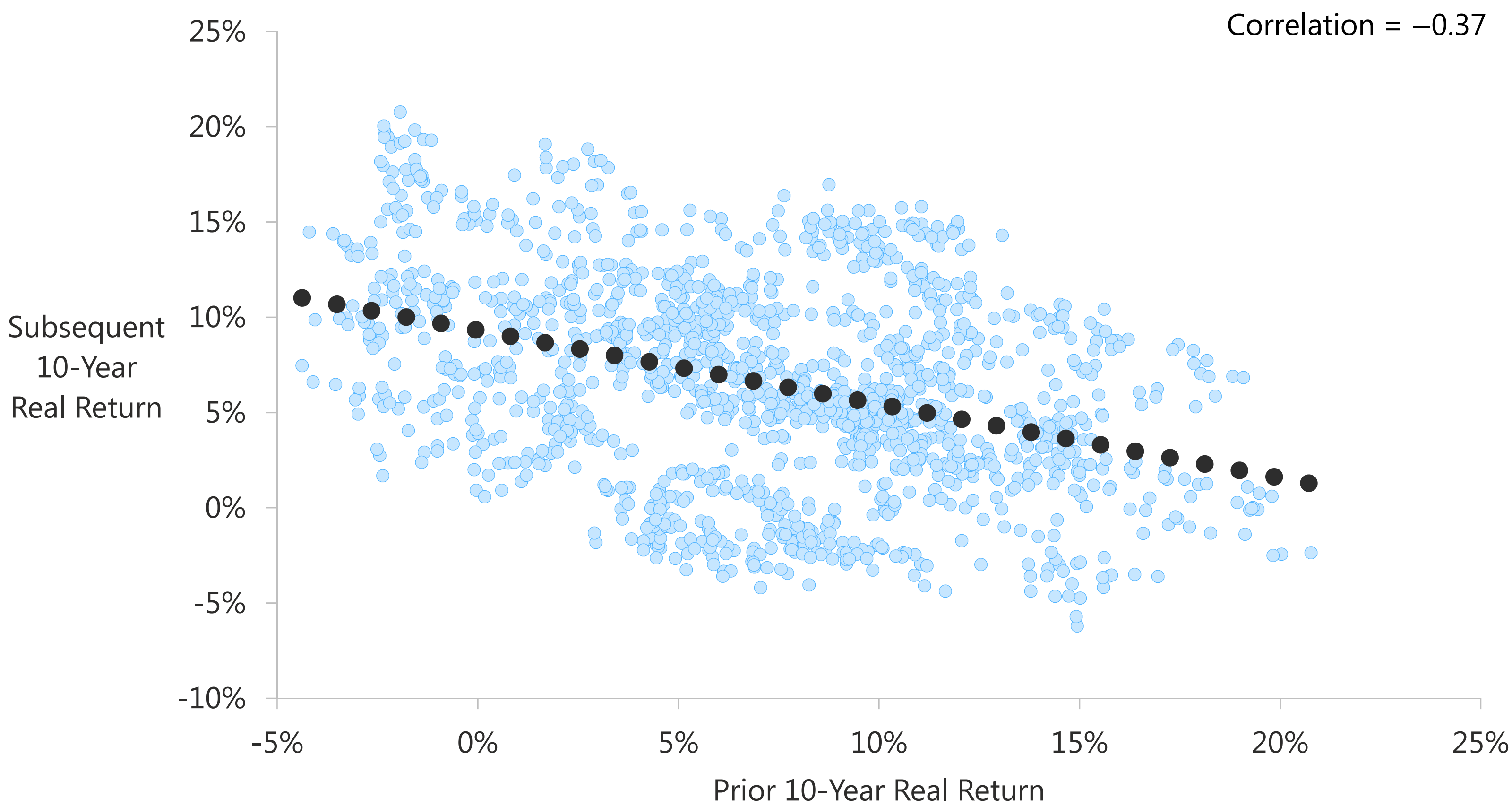
As of June 30, 2017



Source: Research Affiliates, LLC, based on data from MSCI Inc., Bloomberg, and Barclays. The country-specific Treasury indices are represented by the Barclays US Treasury 5-7 year, Barclays Germany Treasury 5-7 year, Barclays Japan Treasury 5-7 year, and Barclays UK Treasury 5-7 year. For more information, please visit http://www.researchaffiliates.com/AssetAllocation/Pages/Fixed-Income.aspx.

Equities: Past Is Not Prologue

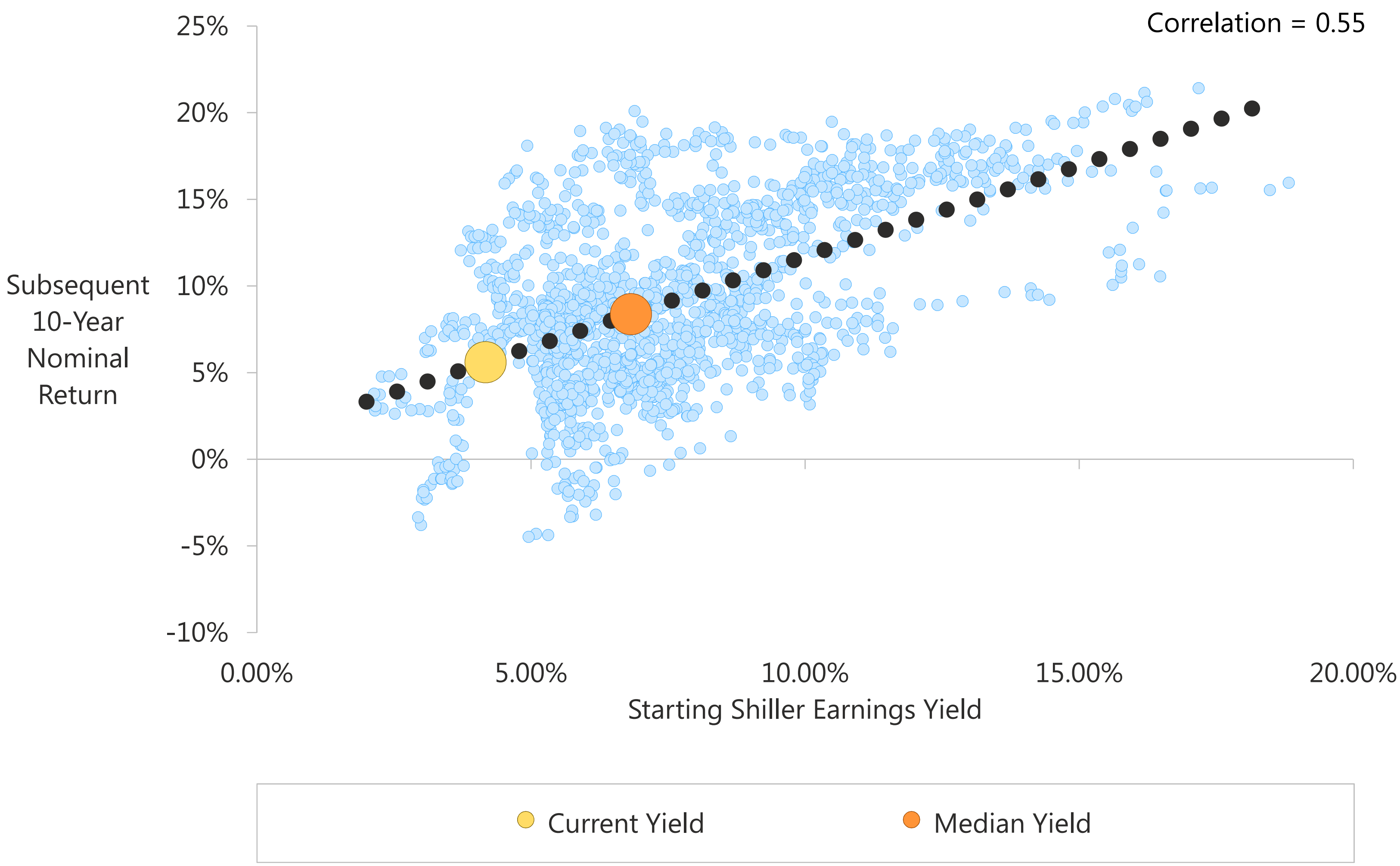
United States, January 1871–2016



Source: Research Affiliates, LLC, based on data from Shiller, Ibbotson, and Bloomberg.

Equities: Future Returns Follow Starting Yields

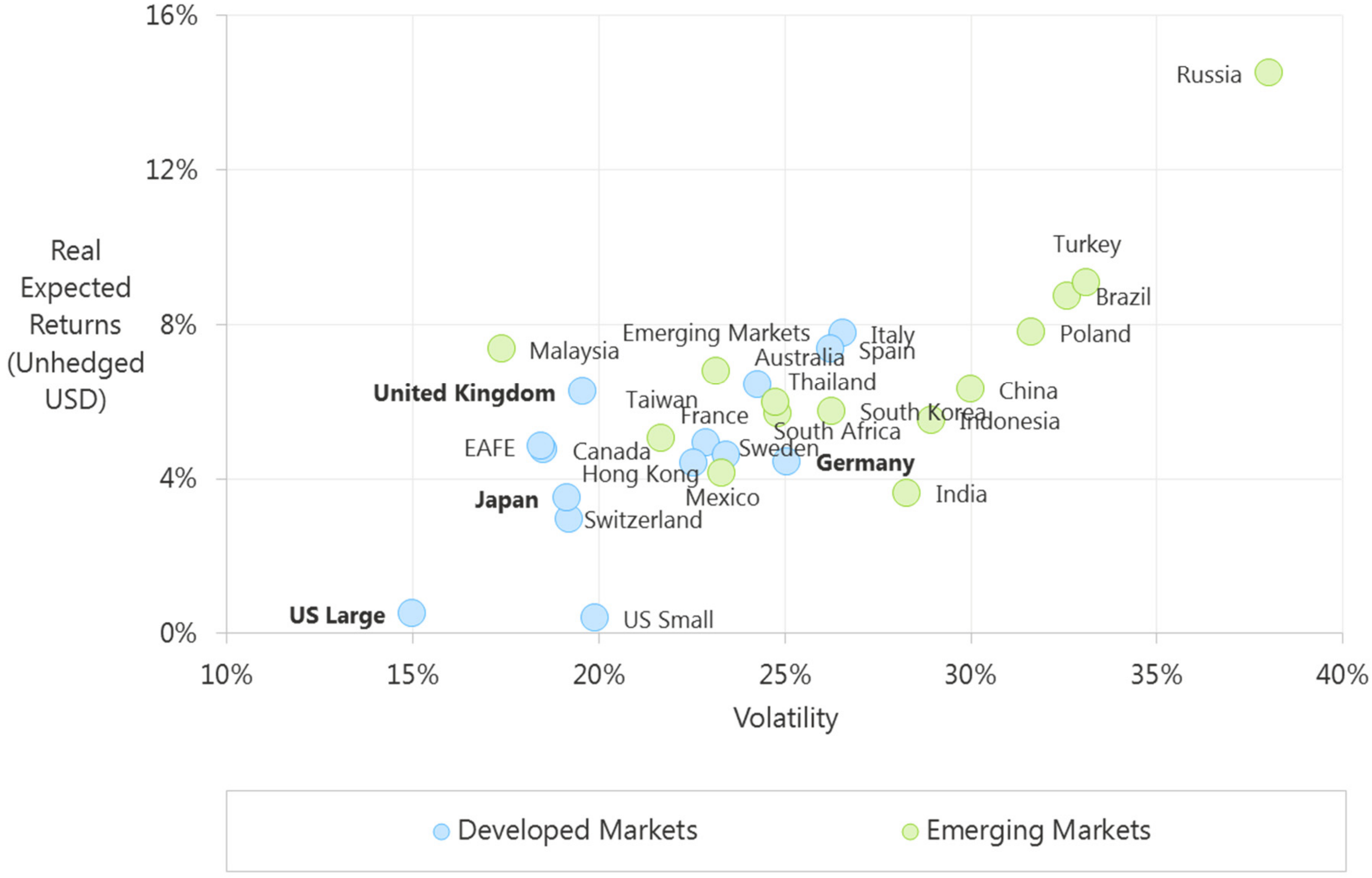
United States, January 1871–2016



Source: Research Affiliates, LLC, based on data from Shiller, Ibbotson, and Bloomberg.

Equities: Long-Term Return Expectations

As of June 30, 2017



Source: Research Affiliates, LLC, based on data from Ibbotson, Shiller, Bloomberg, MSCI, and FactSet. The bolded country indices are represented by the S&P 500, MSCI Germany, MSCI Japan, and MSCI UK. For more information, please visit http://www.researchaffiliates.com/AssetAllocation/Pages/Equities.aspx.

Getting Smart Beta Right

How Can Smart Beta Go Horribly Wrong?

- **Watch out for trend chasing! Valuations matter!**
  - Most investors already practice a form of market "timing"—unfortunately in the wrong direction—by chasing past performance. *(They fund the success of contrarian investors.)*
  - Emphasizing factors or strategies that are trading cheap relative to their own historical norms and deemphasizing the more expensive factors or strategies can improve performance.

Endemic Performance Chasing Abounds

Trend Chasing Everywhere: Survivorship Bias

Academics look for best historical performance

Practitioners look for best historical performance.

Asset Owners look for best historical performance.

- **Problem: Not all factors are robust.**
  - Selection bias and data mining are mistaken for persistent alpha.[1]
  - Rising valuations are mistaken for persistent alpha.[2]

[1] Harvey, Liu, Zhu (2015); Beck, Hsu, Kalesnik, Kostka (2016).

[2] Fama, French (2002); Arnott, Bernstein (2002); Campbell, Shiller (1988); Cochrane (2008).

Most Academics Are Trend Chasers!

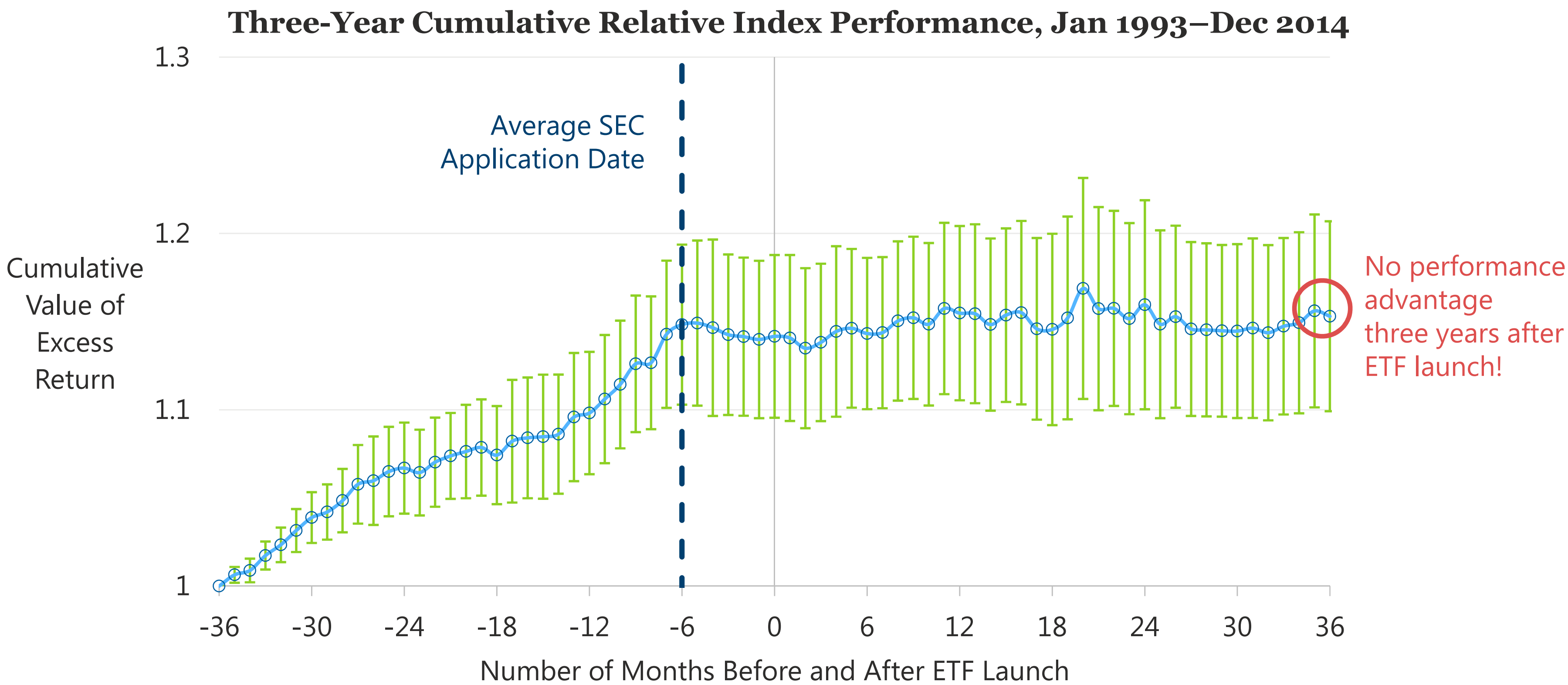
Return Degradation Before and After Factor Publication
United States, Jan 1967–Aug 2016

Annualized Results	Value (Blend)	Value (B/P)	Momentum	Size	Illiquidity	Low Beta	Profitability	Investment	Average
Year Published	1977	1977	1993	1981	2002	1975	2013	2004	
Before Publication	9.8%	9.1%	5.4%	7.0%	2.5%	7.4%	1.2%	3.5%	5.8%
After Publication	2.3%	1.4%	3.7%	0.8%	5.0%	2.1%	5.0%	-1.0%	2.4%
Difference	-7.5%	-7.8%	-1.8%	-6.2%	2.5%	-5.4%	3.8%	-4.5%	-3.3%

» **After-Publication Alpha Is *Not Large!***
- » 2.4% is for long–short portfolio … 1.2% per side.
- » That's before trading costs, implementation shortfall, and fees.
- » Residual alpha for end customers *could easily be zero!*

Source: Research Affiliates, LLC, using data from CRSP/Compustat and Worldscope/Datastream.

Most Product Providers Are Trend Chasers!



» The average ETF return is 4.2% **prior to** launch.

» The average ETF return is –0.5% return **after** launch.

» Gap is – 4.7% average per annum return!

Source: Research Affiliates, LLC, based on data from Bloomberg.

Note: In the research, we select long-only index-tracking ETFs that have at least a three-year index record when launched in the US. The total number of ETFs is 278, while the total number of indices tracked by these ETFs is 240. SEC application date refers to the filing date of the initial registration statement with the US Securities and Exchange Commission.

Slightly Better for Smart Beta…
But Still Evidence of Trend Chasing!

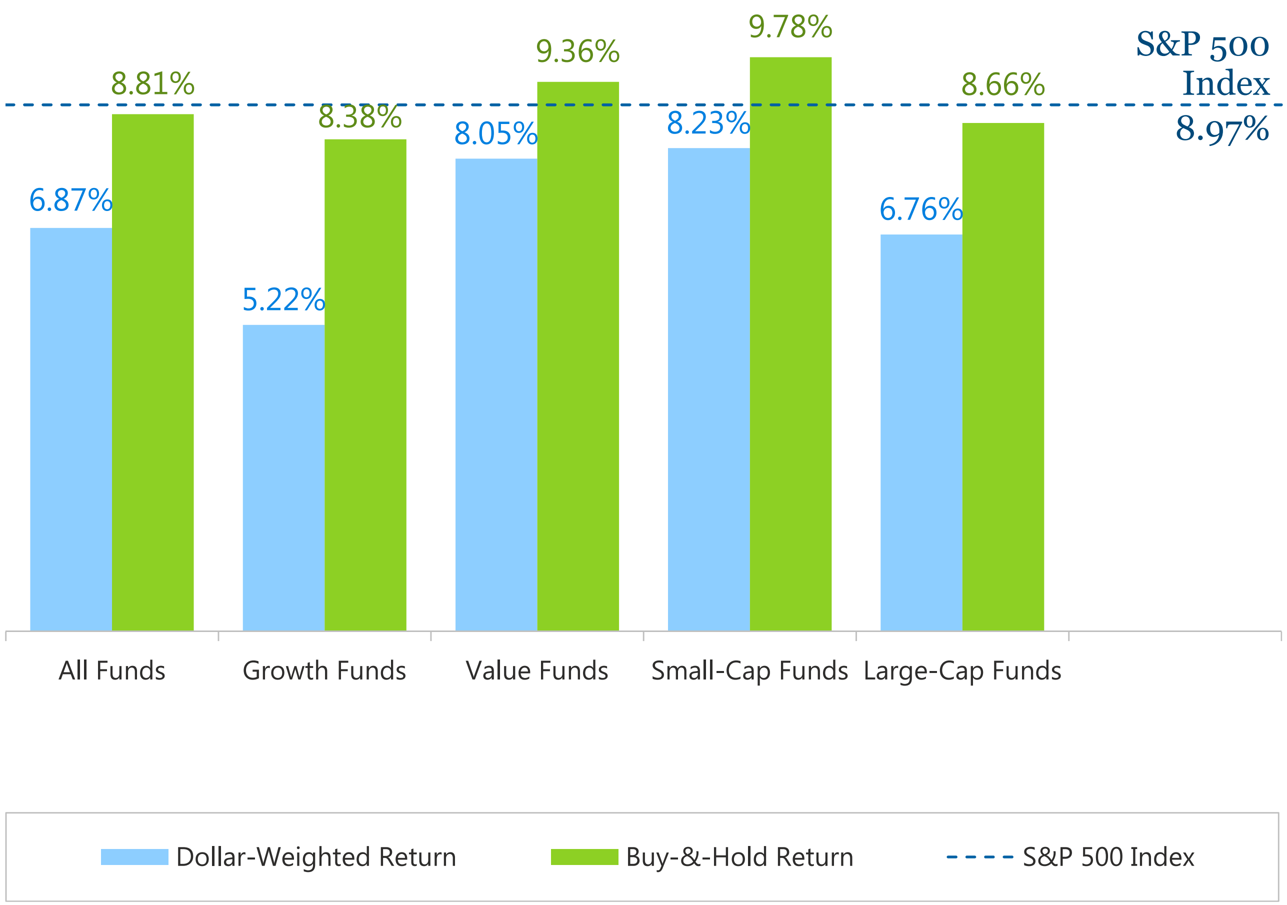
Return Degradation Before and After Smart Beta Index Launch
United States, Jan 1967–Aug 2016

Annualized Results	Fundamental Index	Equal Weight	Low-Vol Index	FTSE RAFI Low Vol	Quality Index	Dividend Index	Risk Efficient	Maximum Diversification	Average
Year Launched	Nov-05	Jan-03	Feb-11	Apr-13	Dec-12	Nov-03	Jan-10	Nov-11	
Before Launch	2.0%	1.3%	1.2%	2.2%	0.4%	2.9%	2.7%	1.6%	1.8%
After Launch	0.5%	2.3%	2.1%	0.1%	0.1%	1.3%	0.9%	4.1%	1.4%
Difference	-1.5%	1.0%	0.9%	-2.1%	-0.4%	-1.6%	-1.9%	2.5%	-0.4%

- **Here, at least, there's some hope …**
  - 1.4% after launch is not bad; not far below prior simulated results.
  - Again, this is before trading costs, implementation shortfall, and fees.
  - But, many of these have low turnover, and most have delivered live results ahead of benchmark since launch, net of all fees and costs.

Source: Research Affiliates, LLC, using data from CRSP/Compustat and Worldscope/Datastream.

Most Investors Are Trend Chasers!



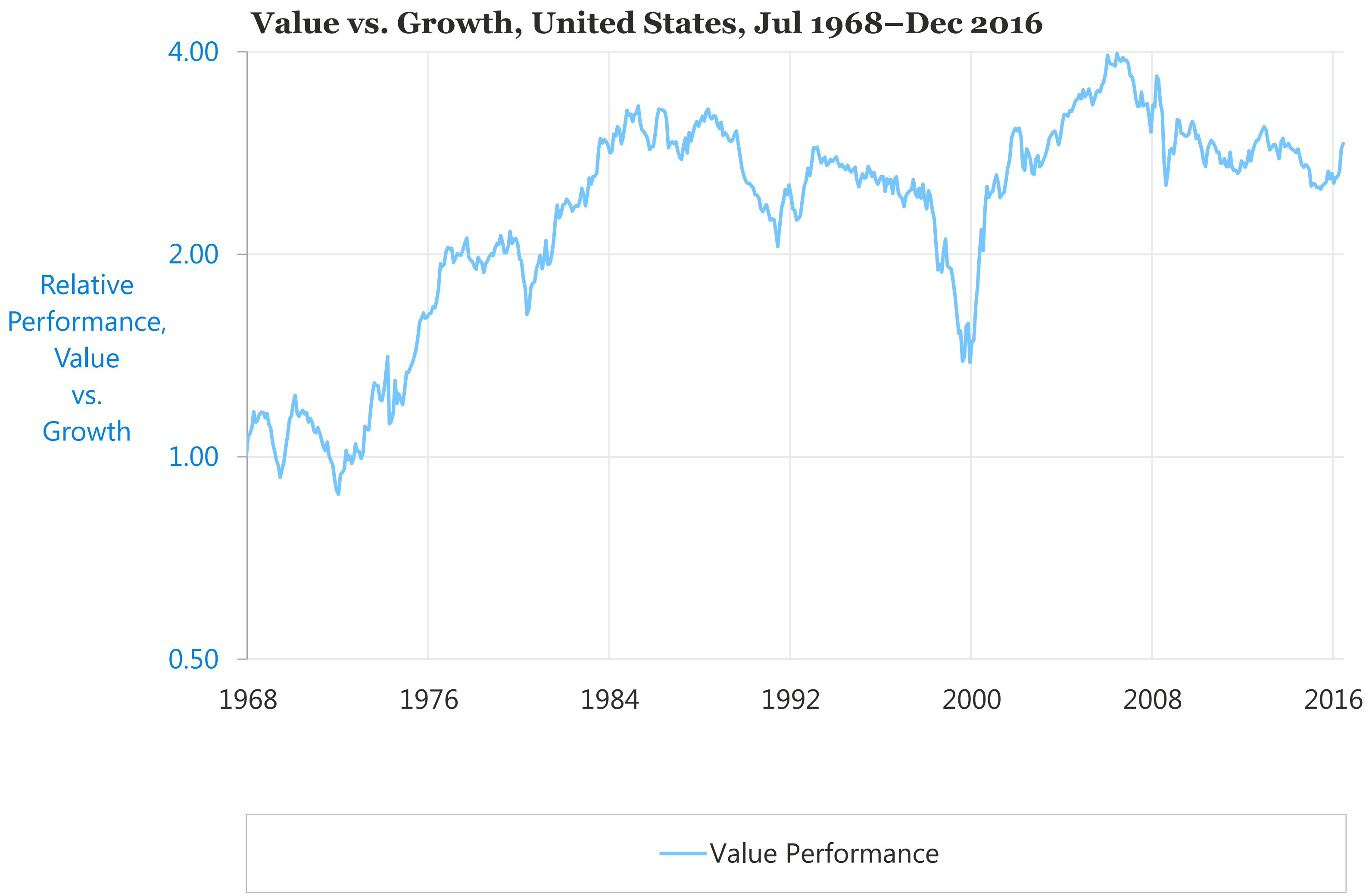
Source: "Timing Poorly: A Guide to Generating Poor Returns While Investing in Successful Strategies," *Journal of Portfolio Management* (Winter 2016) Hsu, Myers, and Whitby.

Alpha Decomposition

$$\textit{Portfolio Alpha} \approx \underbrace{\textit{Return Due to Change in Relative Valuation}}_{\text{“Revaluation Alpha”}} + \underbrace{\textit{Valuation-Adjusted Alpha}}_{\text{“Structural Alpha”}}$$

- **Alpha due to change in relative valuation**
  - is mean reverting and averages roughly zero in the long run.
  - contributes significantly to strategy performance in the short run.
    - *“Short run” can mean decades!*
- Alpha adjusted for change in relative valuation is a good measure of the **unconditional** expected return of a strategy.

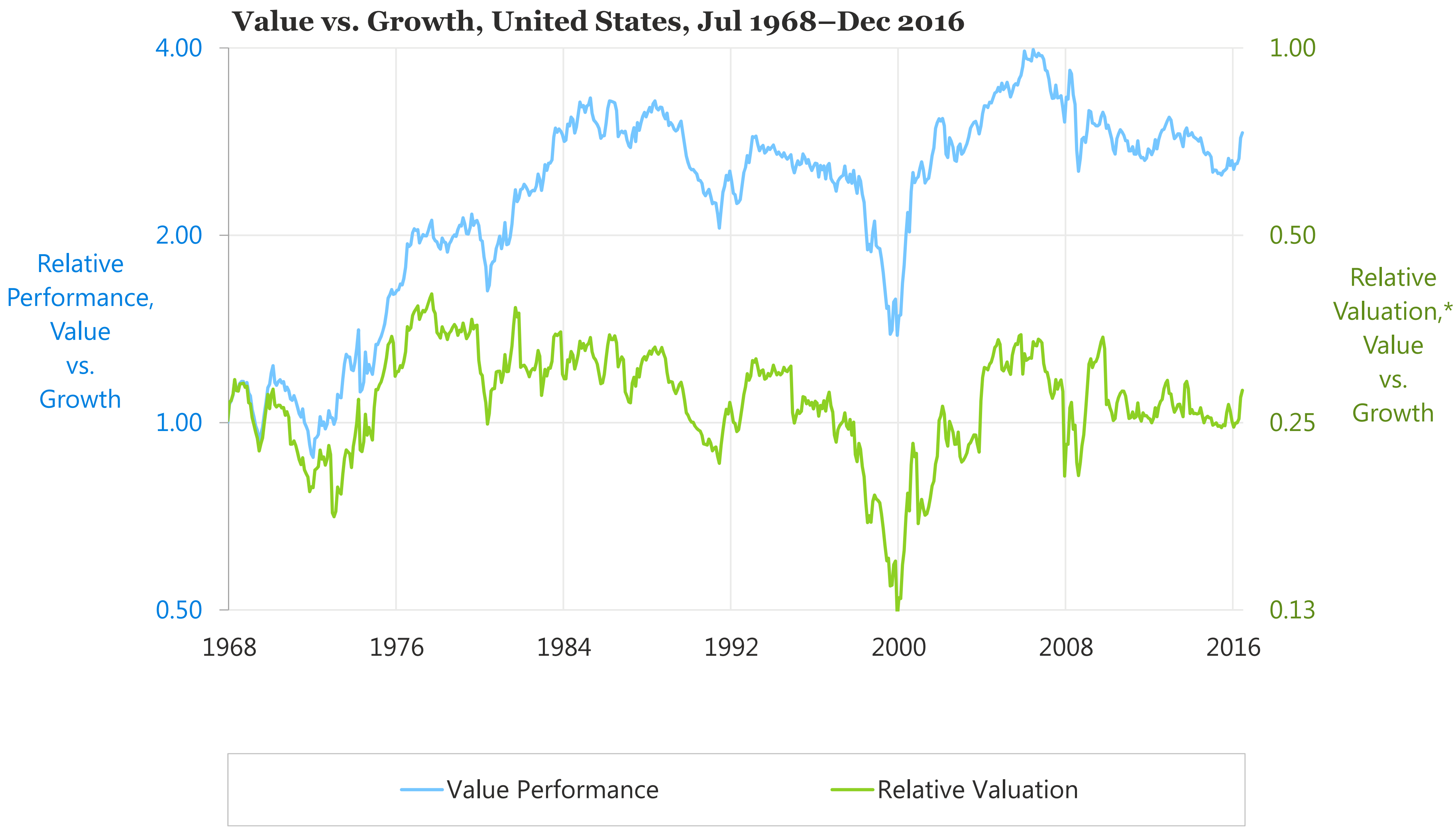
Valuation Cycle for Value Factor



*Based on a blend of four valuation metrics: Price/Book, Price/5yrSales, Price/5yrEarnings, Price/5yrDividends.

Source: Research Affiliates, LLC, using data from CRSP and Compustat.

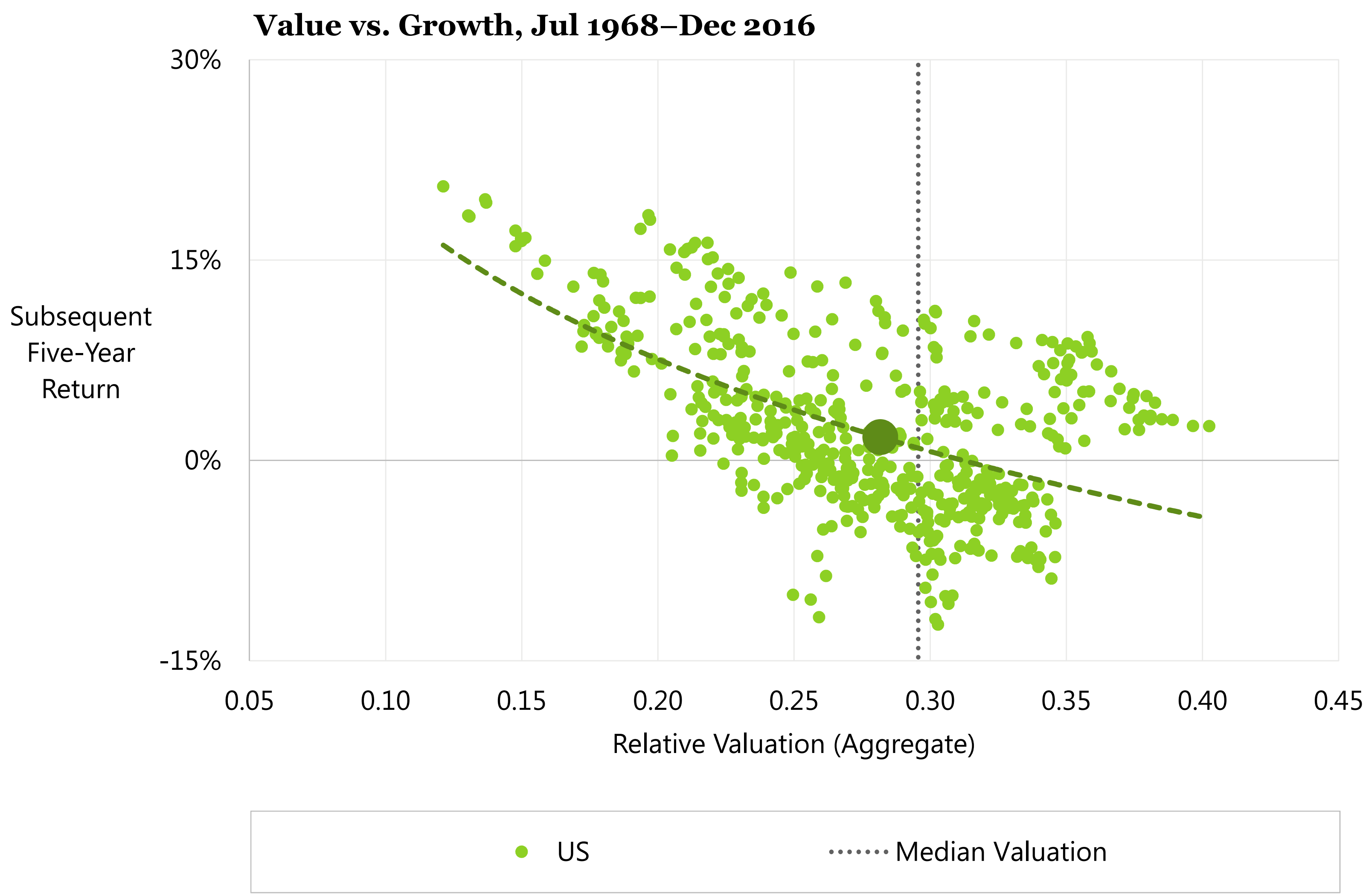
Valuation Cycle for Value Factor



*Based on a blend of four valuation metrics: Price/Book, Price/5yrSales, Price/5yrEarnings, Price/5yrDividends.

Source: Research Affiliates, LLC, using data from CRSP and Compustat.

Factor Valuations Are Predictive of Future Returns
Example: The Value Factor



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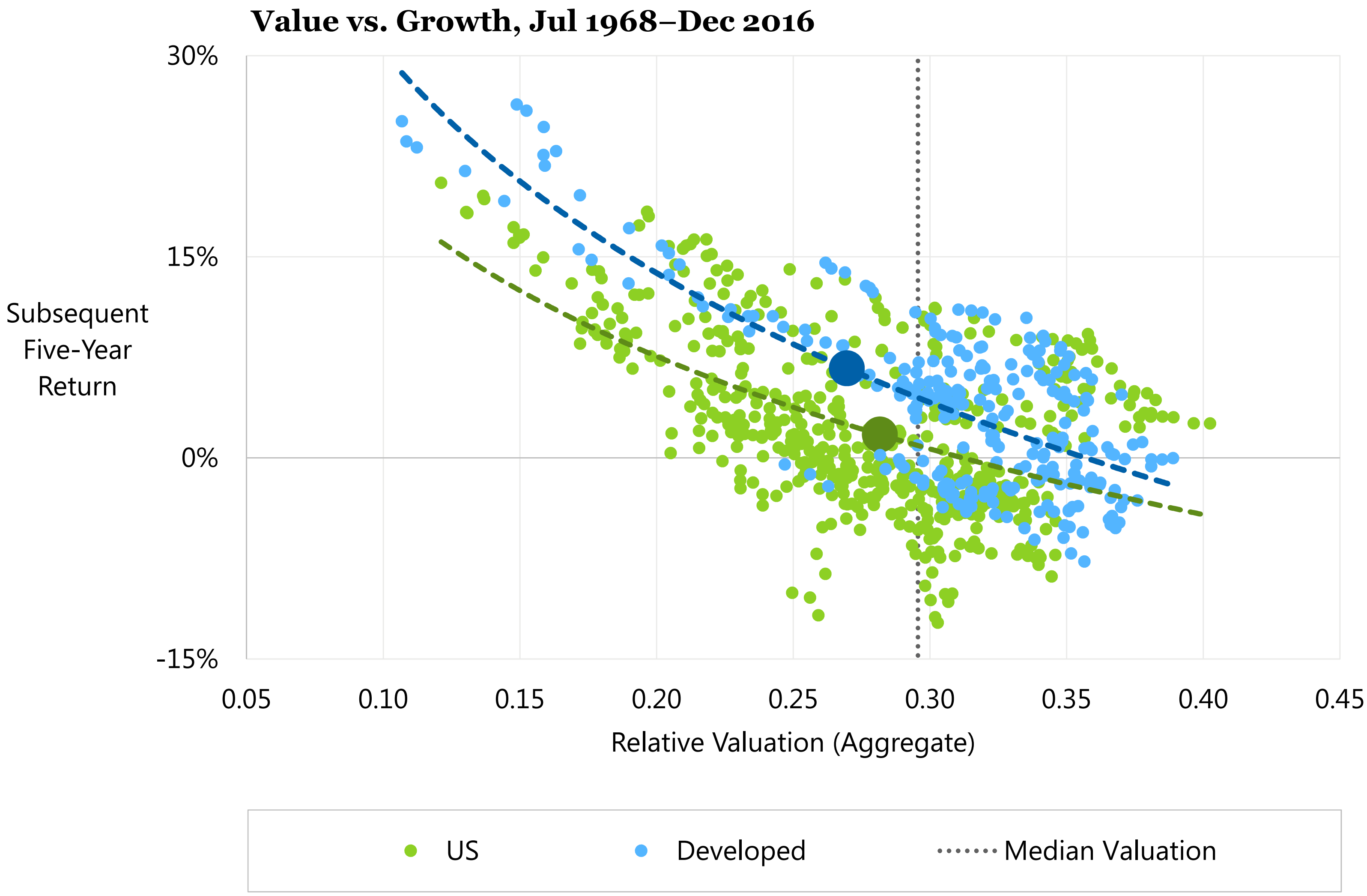

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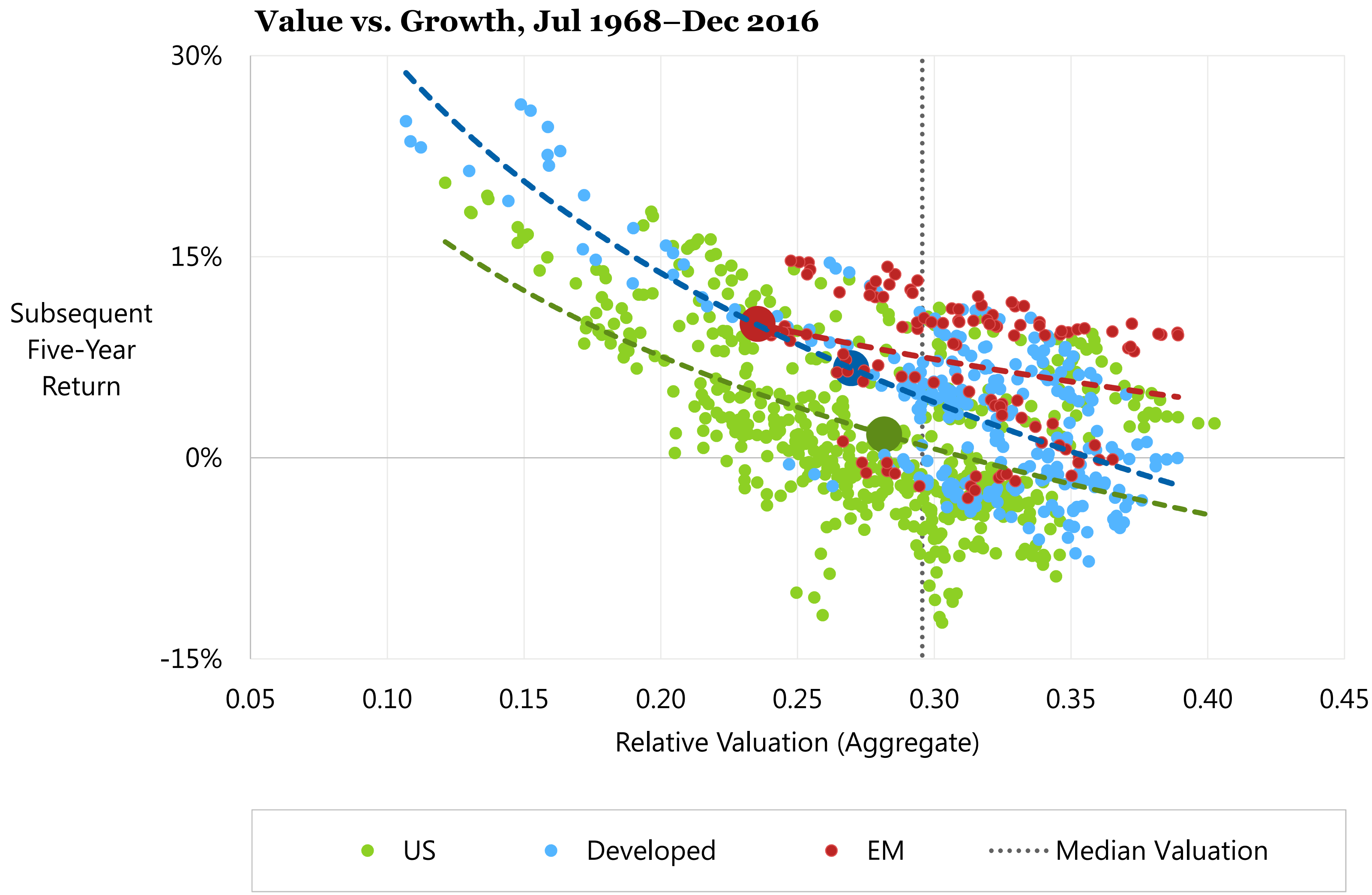

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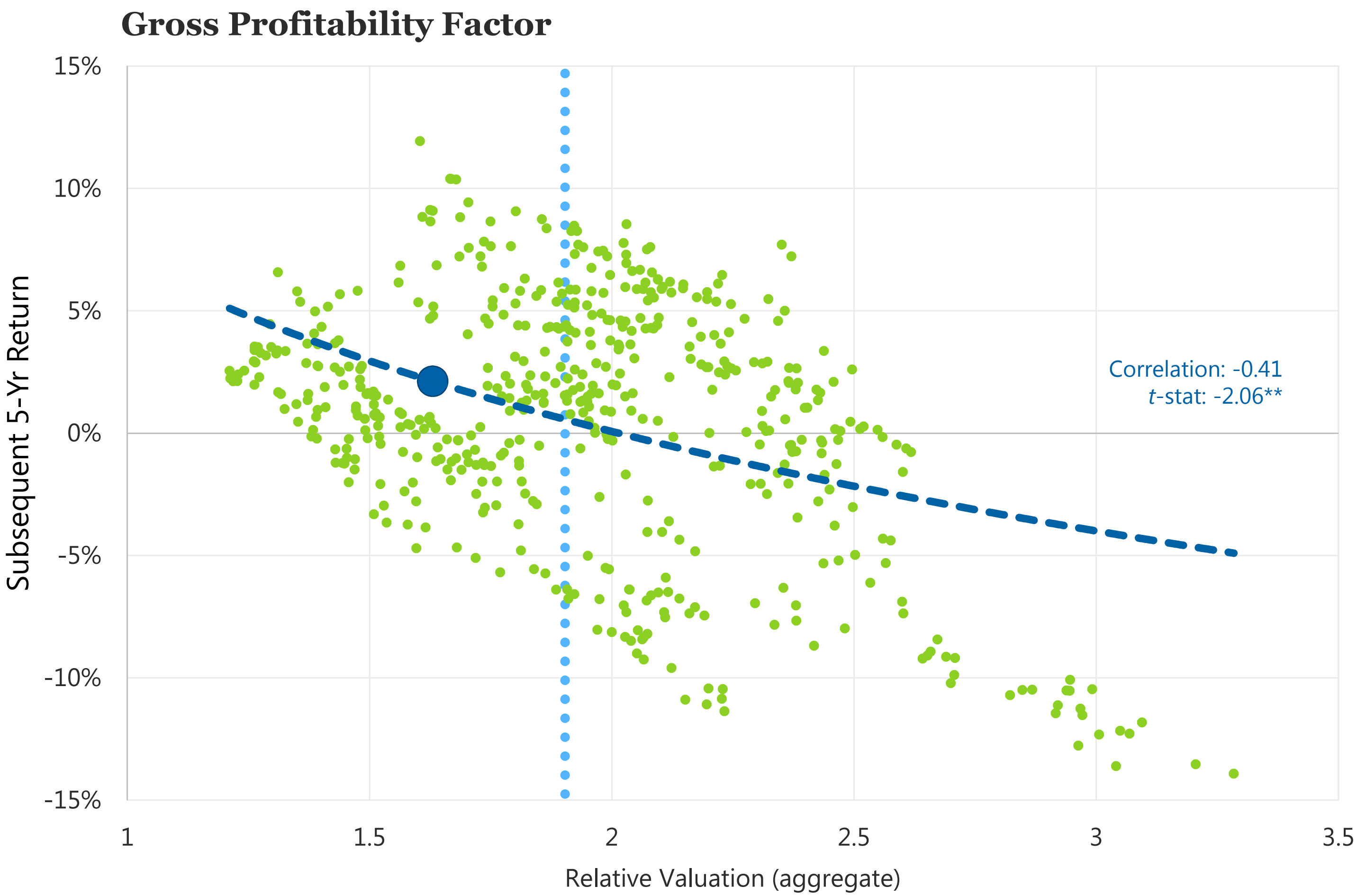

Source: Research Affiliates, LLC, using data from CRSP and Compustat. as of December 2016.

Two-Tail statistical significance: * = 10% threshold; ** = 5% threshold; *** = 1% threshold.

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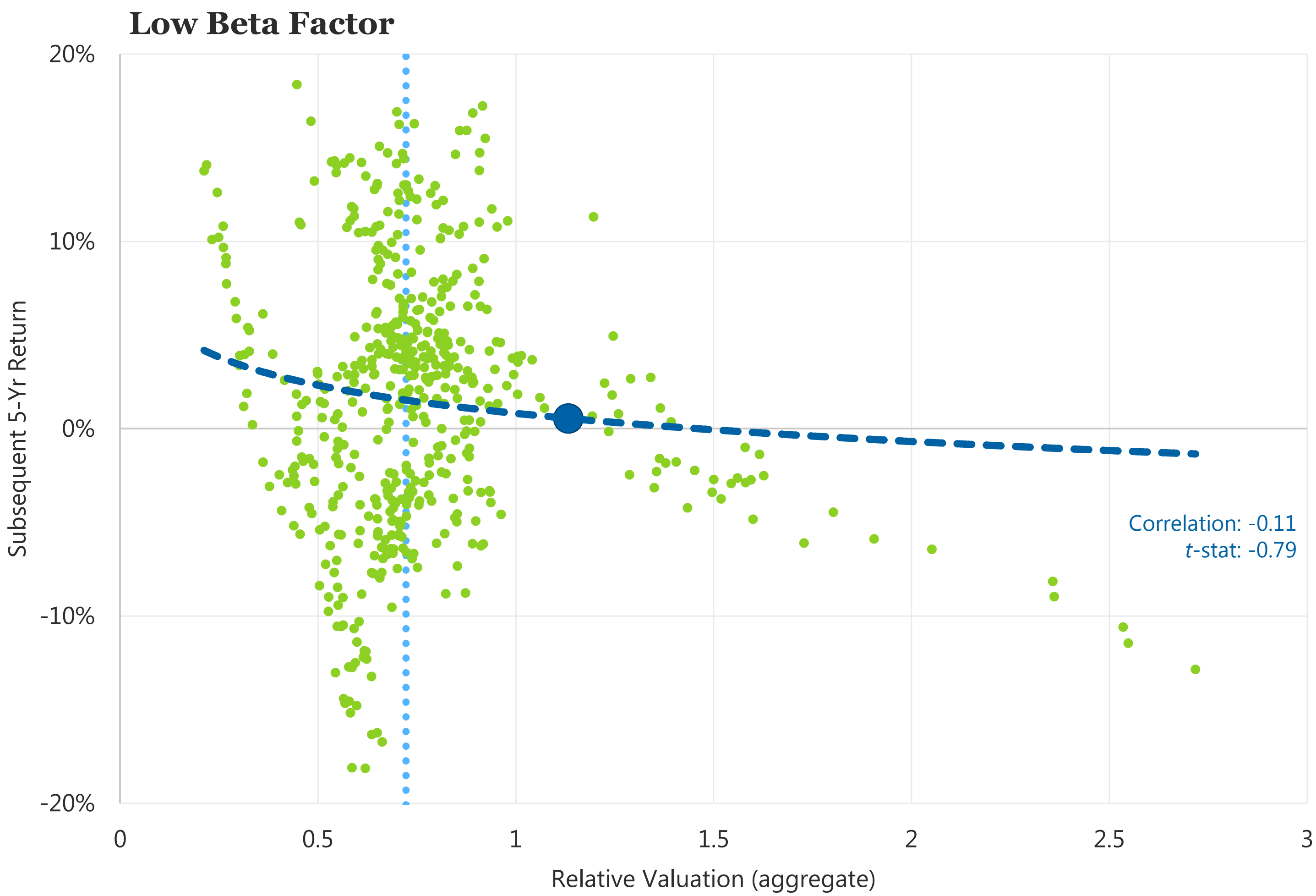

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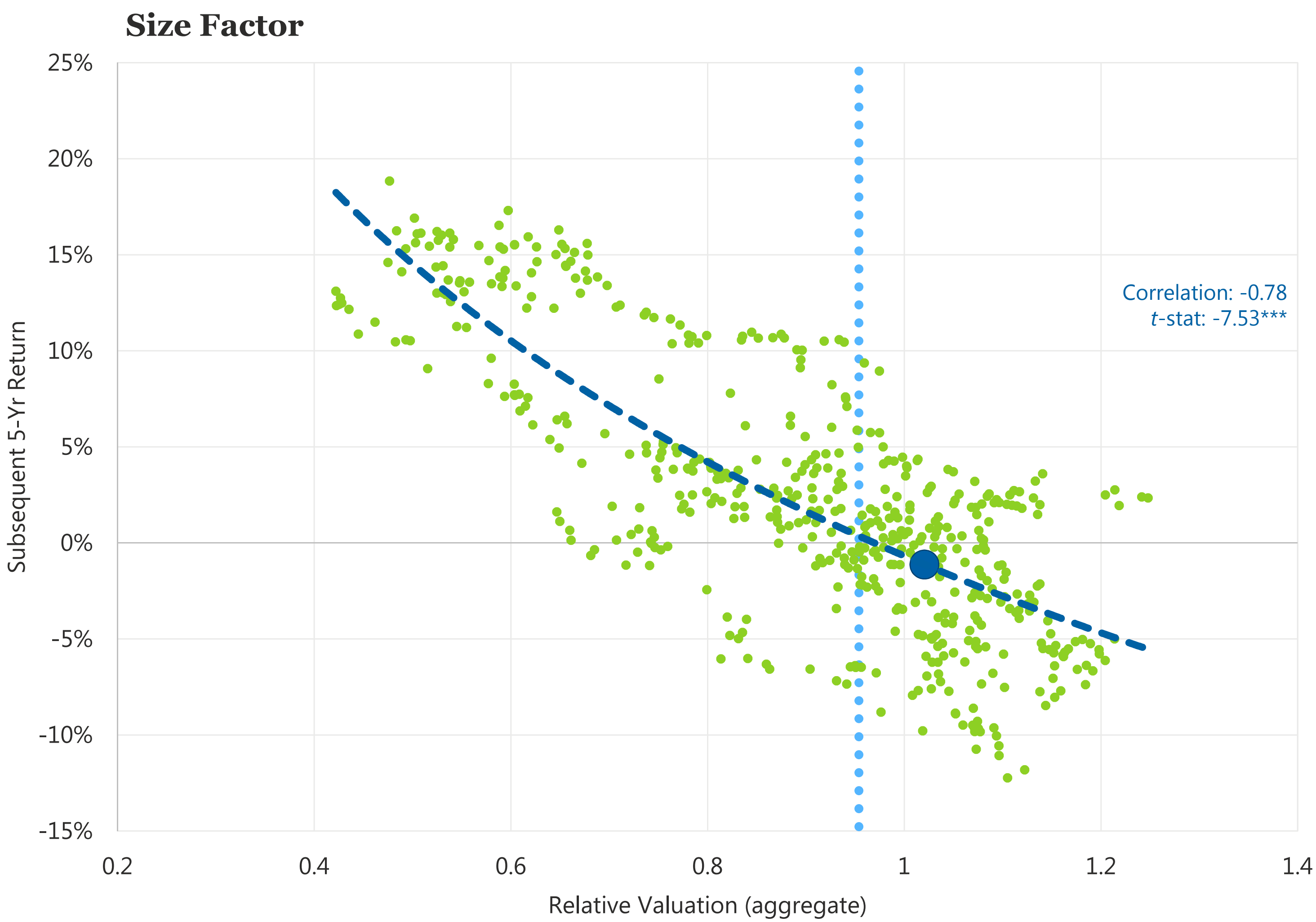

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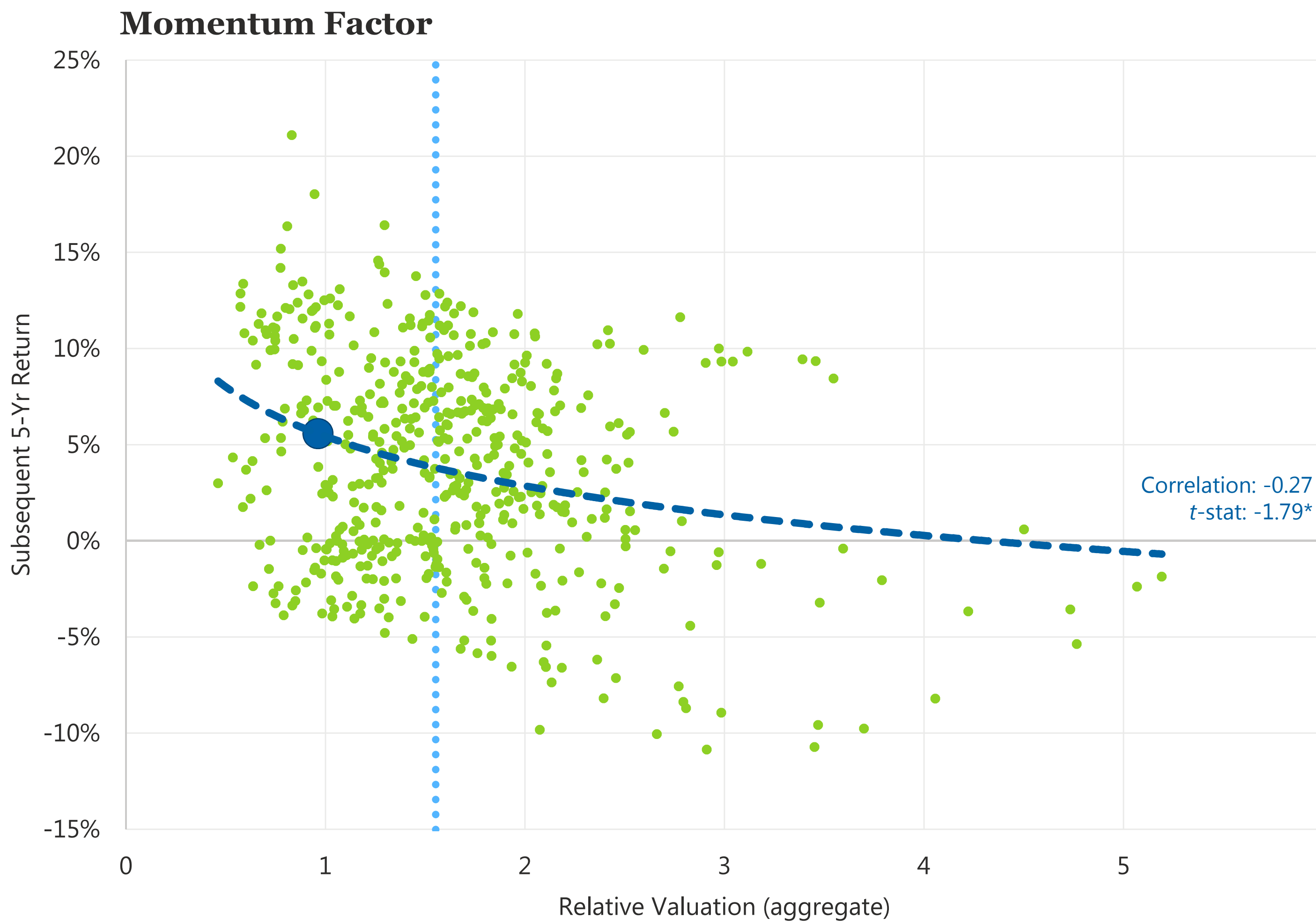

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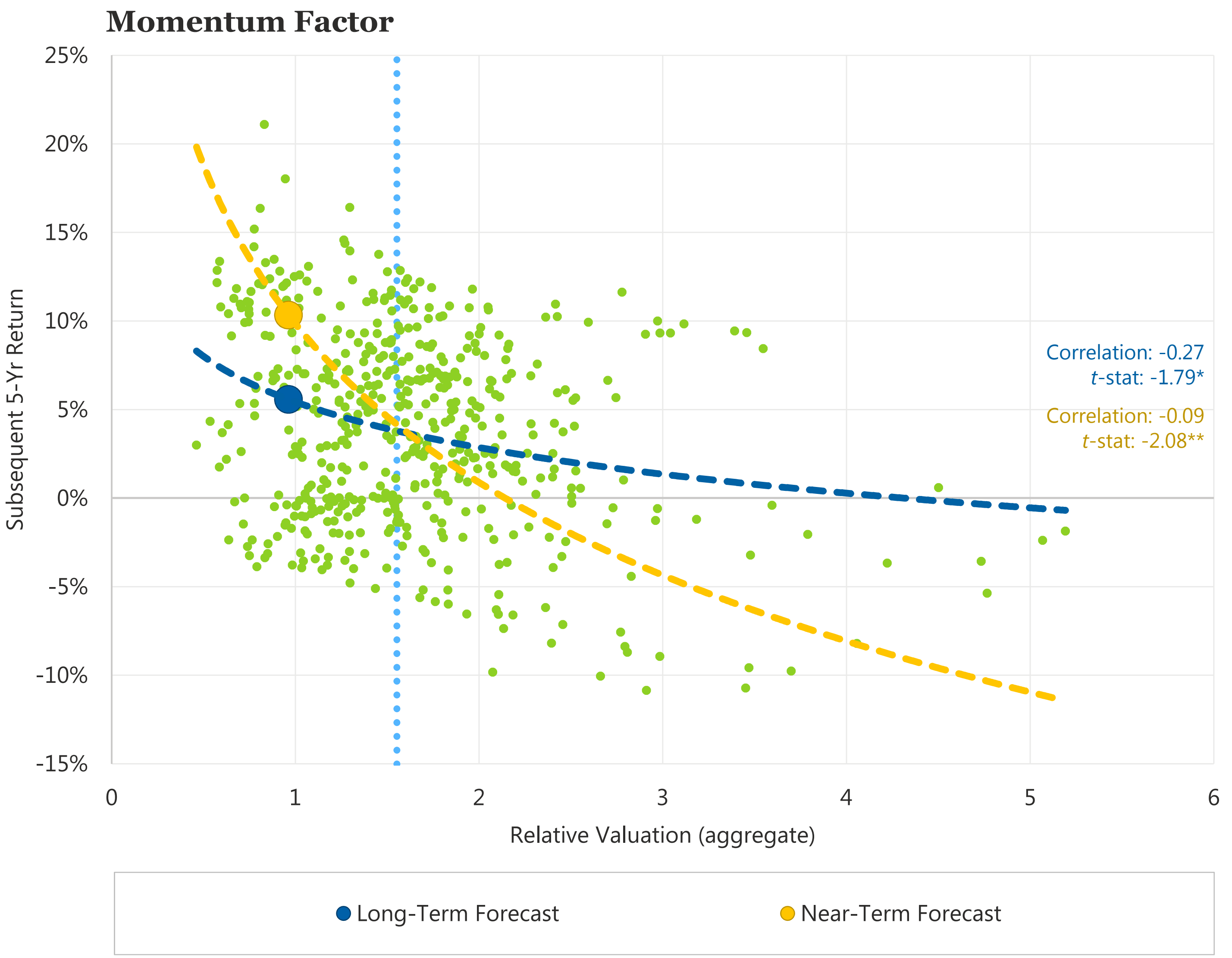

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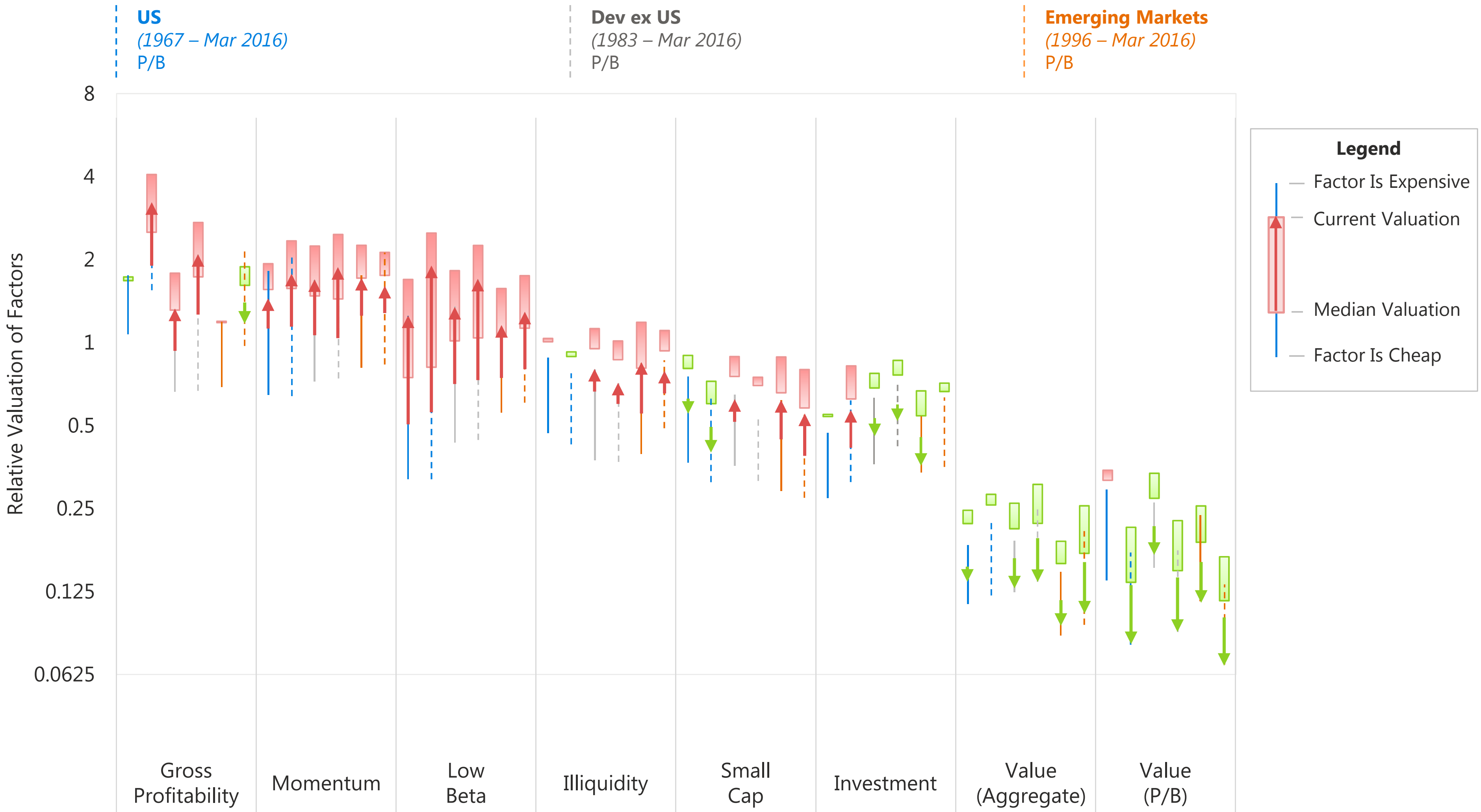
What We Saw in June 2016



Source: Research Affiliates, LLC, using data from CRSP and Compustat, 1967–Mar 2016. The chart was originally published in "To Win with "Smart Beta" Ask If the Price Is Right" (June 2016) Arnott, Beck, and Kalesnik.

What Happened Afterward in 2016

Performance of Value-Oriented Strategies, Jul–Dec 2016

Region	Index	Performance Relative to the Benchmark			Absolute Index Performance		
		Jul-Dec 2016	Prior 3 Years	Prior 5 Years	Jul-Dec 2016	Prior 3 Years	Prior 5 Years
United States	S&P 500				7.8%	39.7%	76.8%
	FTSE RAFI US 1000	3.9%	-5.3%	-2.8%	11.7%	34.4%	74.0%
	Russell 1000 Value	2.6%	-7.0%	-5.6%	10.4%	32.6%	71.2%
Developed Markets	MSCI World				6.8%	22.3%	37.8%
	FTSE RAFI Developed	4.1%	-5.3%	-8.4%	10.9%	17.0%	29.5%
	MSCI World Value	3.9%	-6.5%	-7.2%	10.7%	15.9%	30.7%
Emerging Markets	MSCI Emerging Markets				4.5%	-4.6%	-17.5%
	FTSE RAFI Emerging	10.6%	-3.1%	-7.7%	15.1%	-7.7%	-25.3%
	MSCI Emerging Markets Value	2.5%	-4.9%	-7.2%	7.0%	-9.6%	-24.8%

Source: Research Affiliates, LLC, using data from Bloomberg. Relative performance is measured against the S&P 500 in the US, MSCI World in Developed Markets, and MSCI EM in Emerging Markets.

What Happened Afterward in 2016

Performance of Low Beta-Oriented Strategies, Jul–Dec 2016

Region	Index	Performance Relative to the Benchmark			Absolute Index Performance		
		Jul-Dec 2016	Prior 3 Years	Prior 5 Years	Jul-Dec 2016	Prior 3 Years	Prior 5 Years
United States	S&P 500				7.8%	39.7%	76.8%
	S&P 500 Low Volatility	-9.6%	9.4%	21.6%	-1.7%	49.1%	98.4%
Developed Markets	MSCI World				6.8%	22.3%	37.8%
	S&P Developed Low Volatility	-8.7%	9.2%	18.1%	-1.9%	31.5%	56.0%
Emerging Markets	MSCI Emerging Markets				4.5%	-4.6%	-17.5%
	S&P Emerging Markets Low Volatility	-7.0%	-6.2%	10.7%	-2.5%	-10.8%	-6.8%

Source: Research Affiliates, LLC, using data from Bloomberg. Relative performance is measured against the S&P 500 in the US, MSCI World in Developed Markets, and MSCI EM in Emerging Markets.

What Happened Afterward in 2016

Performance of Quality-Oriented Strategies, Jul–Dec 2016

Region	Index	Performance Relative to the Benchmark			Absolute Index Performance		
		Jul-Dec 2016	Prior 3 Years	Prior 5 Years	Jul-Dec 2016	Prior 3 Years	Prior 5 Years
United States	S&P 500				7.8%	39.7%	76.8%
	MSCI USA Quality	-0.8%	0.8%	1.6%	7.0%	40.5%	78.5%
Developed Markets	MSCI World				6.8%	22.3%	37.8%
	MSCI World Quality	-3.3%	10.8%	20.4%	3.5%	33.2%	58.3%
Emerging Markets	MSCI Emerging Markets				4.5%	-4.6%	-17.5%
	MSCI Emerging Markets Quality	-4.1%	7.5%	11.5%	0.4%	2.9%	-6.0%

Source: Research Affiliates, LLC, using data from Bloomberg. Relative performance is measured against the S&P 500 in the US, MSCI World in Developed Markets, and MSCI EM in Emerging Markets.

What Happened Afterward in 2016

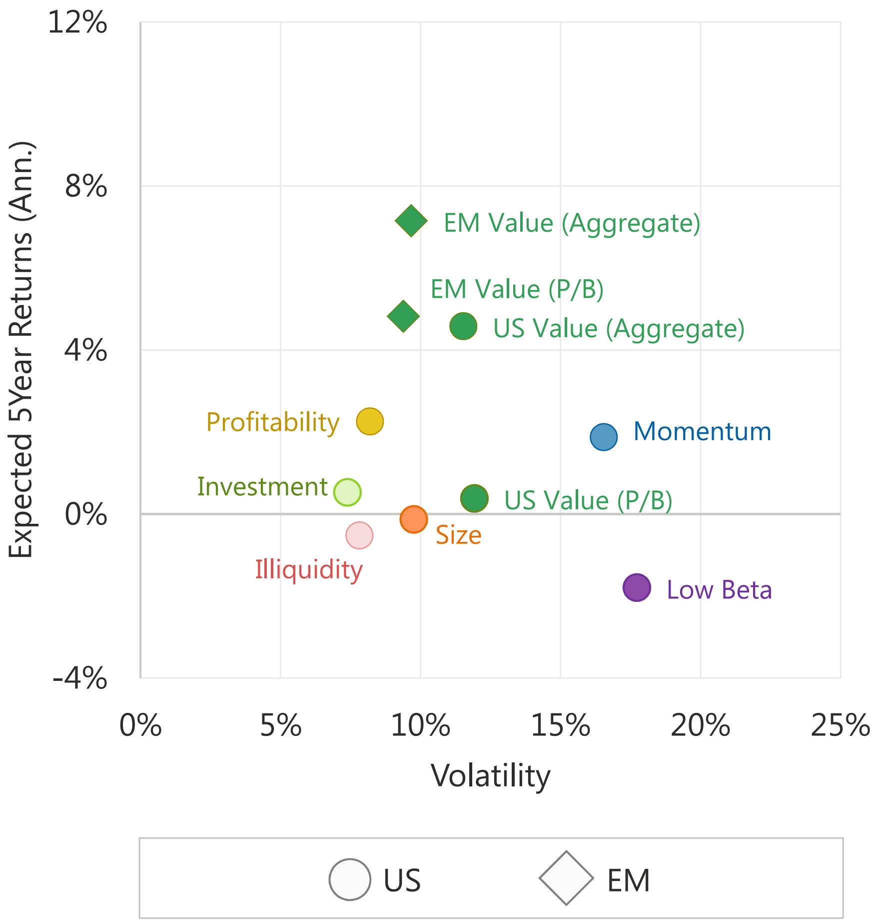
Performance of Momentum-Oriented Strategies, Jul–Dec 2016

Region	Index	Performance Relative to the Benchmark			Absolute Index Performance		
		Jul-Dec 2016	Prior 3 Years	Prior 5 Years	Jul-Dec 2016	Prior 3 Years	Prior 5 Years
United States	S&P 500				7.8%	39.7%	76.8%
	S&P 500 Momentum	-4.2%	-3.0%	-7.9%	3.6%	36.6%	69.0%
Developed Markets	MSCI World				6.8%	22.3%	37.8%
	S&P Momentum Developed	-5.7%	-0.5%	8.5%	1.1%	21.9%	46.3%
Emerging Markets	MSCI Emerging Markets				4.5%	-4.6%	-17.5%
	S&P Emerging Markets Momentum	-3.7%	12.7%	26.2%	0.8%	8.1%	8.7%

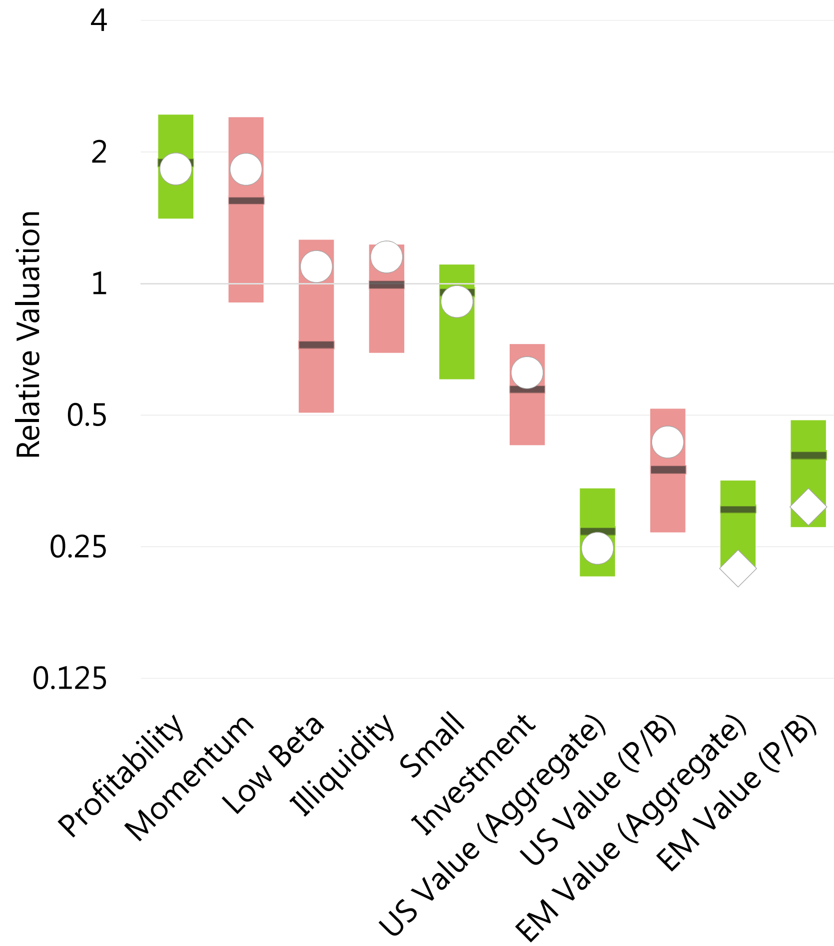
Source: Research Affiliates, LLC, using data from Bloomberg. Relative performance is measured against the S&P 500 in the US, MSCI World in Developed Markets, and MSCI EM in Emerging Markets.

Research Affiliates Smart Beta Interactive Site

Real Long-Term Expected Return, US Factors, as of 6/30/2017



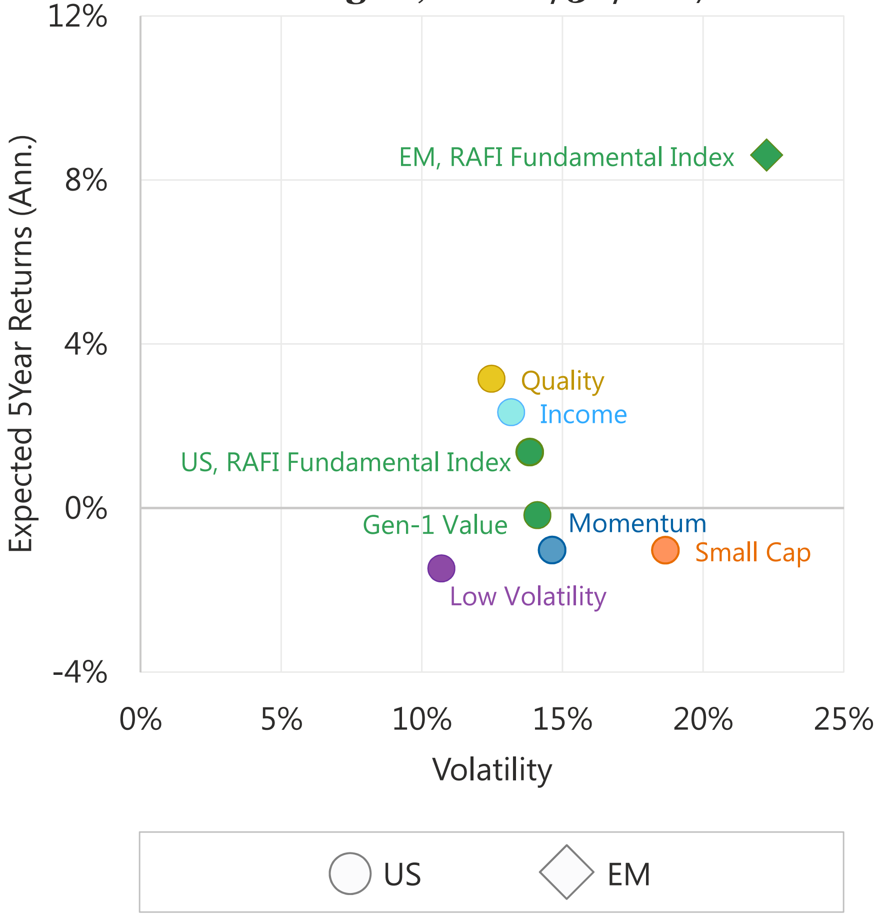
Relative Valuation, Select Factors, as of 6/30/2017



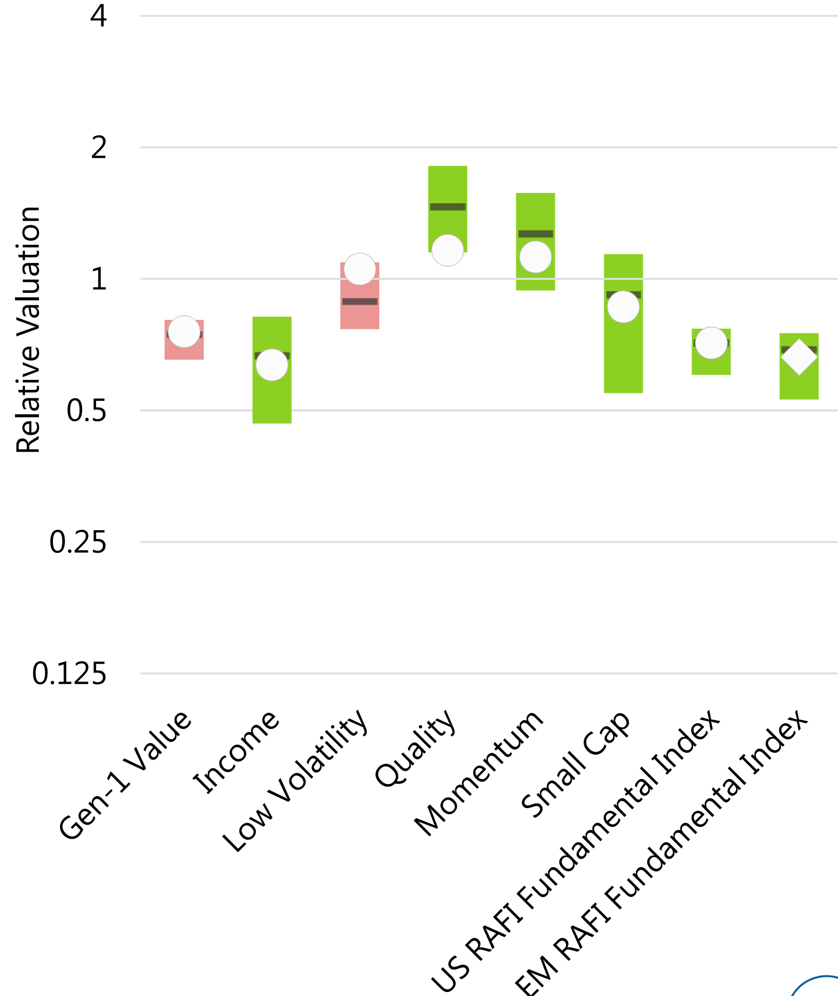
Source: Research Affiliates, LLC, using data from CRSP/Compustat and Worldscope/Datastream.

Research Affiliates Smart Beta Interactive Site

Real Long-Term Expected Return, Net of Transaction Costs, US Smart Beta Strategies, as of 6/30/2017



Relative Valuation, Select Smart Beta Strategies, as of 6/30/2017



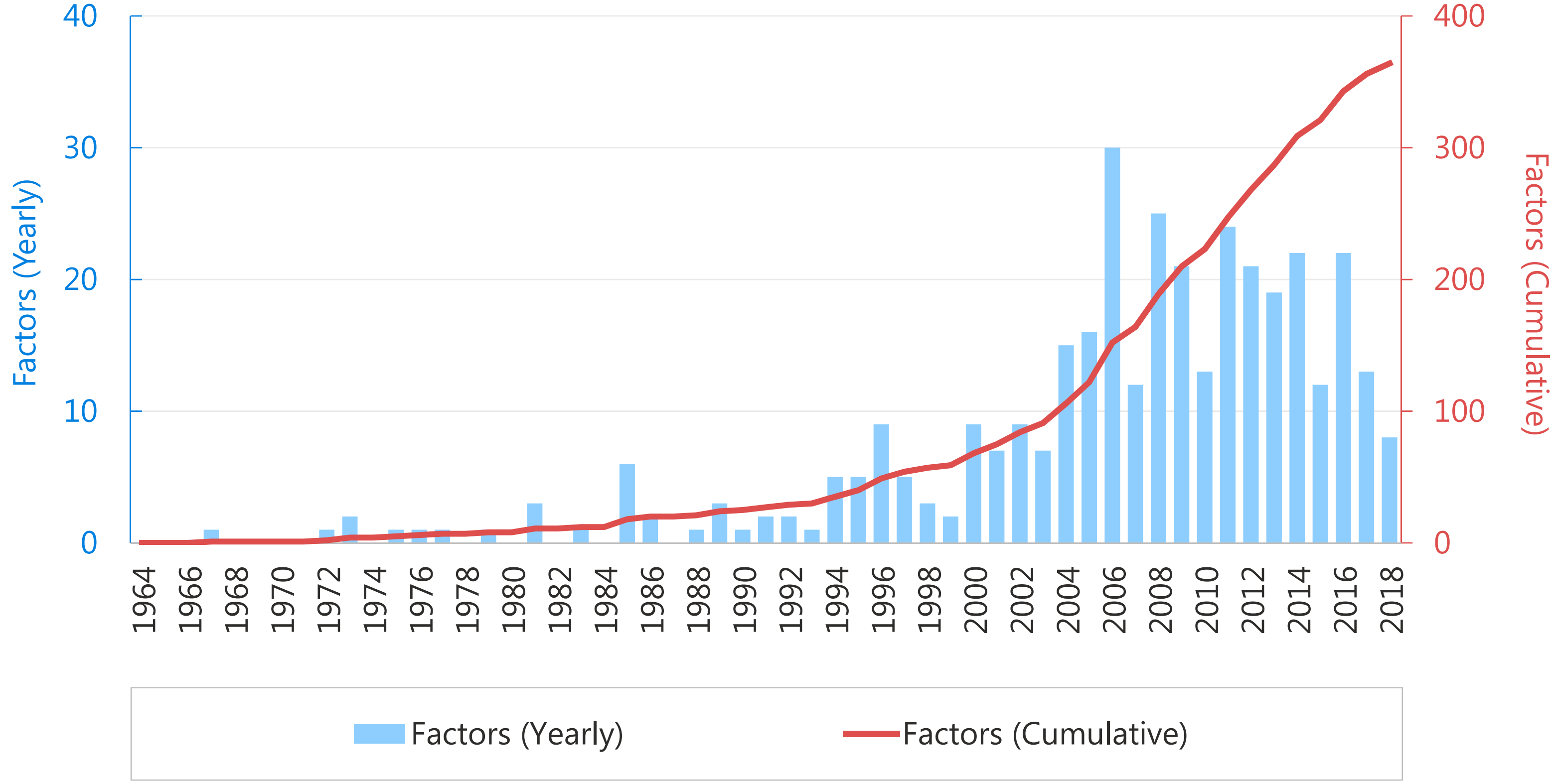
Source: Research Affiliates, LLC, using data from CRSP/Compustat and Worldscope/Datastream.

Which Factors Are Robust?

Accelerating Factor Proliferation

Problem: Not all factors are robust.

- » Selection bias and data mining are mistaken for persistent alpha.[1]
- » Rising valuations are mistaken for persistent alpha.[2]



[1] Harvey, Liu, Zhu (2015); Beck, Hsu, Kalesnik, Kostka (2016).

[2] Fama, French (2002); Arnott, Bernstein (2002); Campbell, Shiller (1988); Cochrane (2008)

Source: "... and the Cross-Section of Expected Returns" (2013) Harvey, Liu, and Zhu. Data updated as of August 2017.

Finding Robustness in the Factor Zoo

ADVERTISING 52-WEEK HIGH INTANGIBLE INFORMATION
BREADTH OF OWNERSHIP DIVIDEND TAX RATE CASH FLOW NEWS
COSKEWNESS SHORT SALE RESTRICTION CREDIT SPREAD
CAPITAL GAINS TAX RATE **VALUE** VARIABILITY OF LIQUIDITY
INFLATION EXPECTATIONS CORPORATE BOND RETURN
LOW BETA
MARKET TRADING VOLUME COMMUNITY INDICATOR
BALANCE SHEET OPTIMISM INDUSTRY CONCENTRATION QUALITY
SIZE
BOARD CENTRALITY STRADDLE RETURN **INVESTMENT**
NONLINEAR FUNCTION OF CONSUMPTION GROWTH OIL PRICE
PROFITABILITY
SELL RECOMMENDATIONS EXCLUDED EXPENSES ILLIQUIDITY
CORPORATE ACQUISITIONS DISCLOSURE LEVEL CREDIT RATING
MOMENTUM
LOW BETA SHAREHOLDER RIGHTS ANALYST DISPERSION
MONEY GROWTH P/E RATIO RETURN CONSISTENCY FIRM AGE

Finding Robustness in the Factor Zoo

Performance Characteristics of US Long-Only Factor-Based Smart Beta Strategies, Jul 1973–Sep 2016

Strategy	Annualized Return (%)	Annualized Volatility (%)	Sharpe Ratio	Value-Add	Tracking Error	IR
Market	11.05	15.60	0.40			
Value	13.37	18.50	0.46	2.32	9.35	0.25
Low Beta	13.43	12.60	0.68	2.39	8.03	0.30
Profitability	11.26	15.00	0.43	0.21	3.25	0.07
Investment	13.70	15.40	0.58	2.65	5.10	0.52
Momentum	13.41	17.10	0.50	2.36	6.82	0.35
Size	14.23	19.90	0.47	3.19	10.03	0.32
Average of Six Factors	13.23	16.40	0.52	2.19	7.10	0.30

Source: Research Affiliates, LLC, using data from CRSP and Compustat.

Diversification Benefits of a Multi-Factor Portfolio

Cross-Correlation between Factor Returns, United States, Jul 1973–Sep 2016

	Value	Low Beta	Profitability	Investment	Momentum	Size
Value	1.00	0.32	0.09	0.54	-0.20	0.01
Low Beta	0.32	1.00	0.31	0.19	0.23	0.01
Profitability	0.09	0.31	1.00	-0.13	0.13	-0.43
Investment	0.54	0.19	-0.13	1.00	0.06	0.08
Momentum	-0.20	0.23	0.13	0.06	1.00	-0.02
Size	0.01	0.01	-0.43	0.08	-0.02	1.00

Source: Research Affiliates, LLC, using data from CRSP and Compustat.

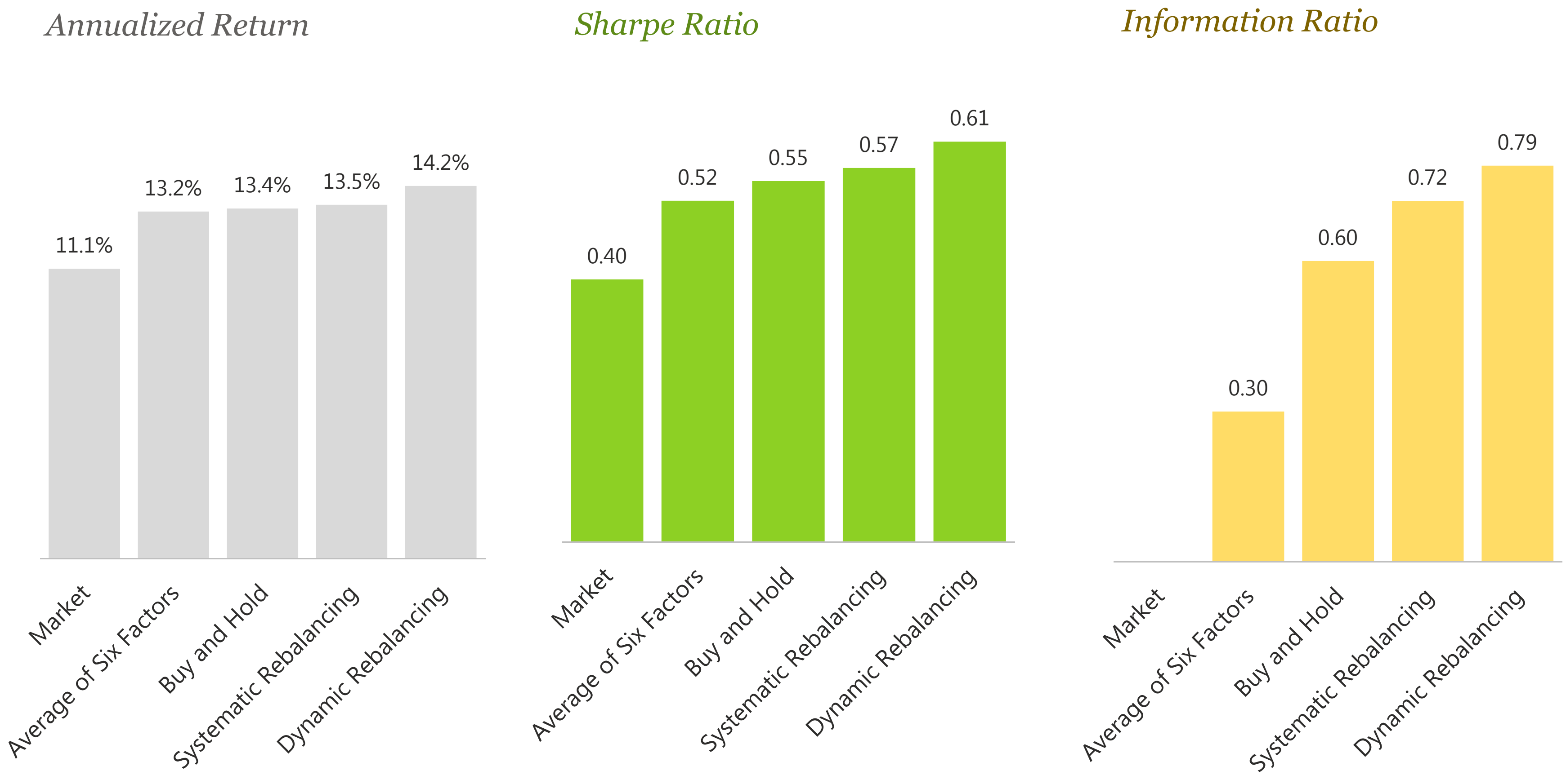
Building a Multi-Factor Portfolio

Three Approaches for a Multi-Factor Portfolio

Buy and Hold	Systematic Rebalancing	Dynamic Rebalancing
Allocate one-sixth of a portfolio to each of the six factor-based smart beta strategies and do not subsequently rebalance this mix.	Allocate one-sixth of a portfolio to each of the six strategies and then rebalance back to a one-sixth allocation every quarter.	Set a default weight of one-sixth to each strategy and then modestly tilt allocations based on short-term price momentum and long-term price mean-reversion signals at each quarterly rebalance.

Dynamic Rebalancing Adds Value

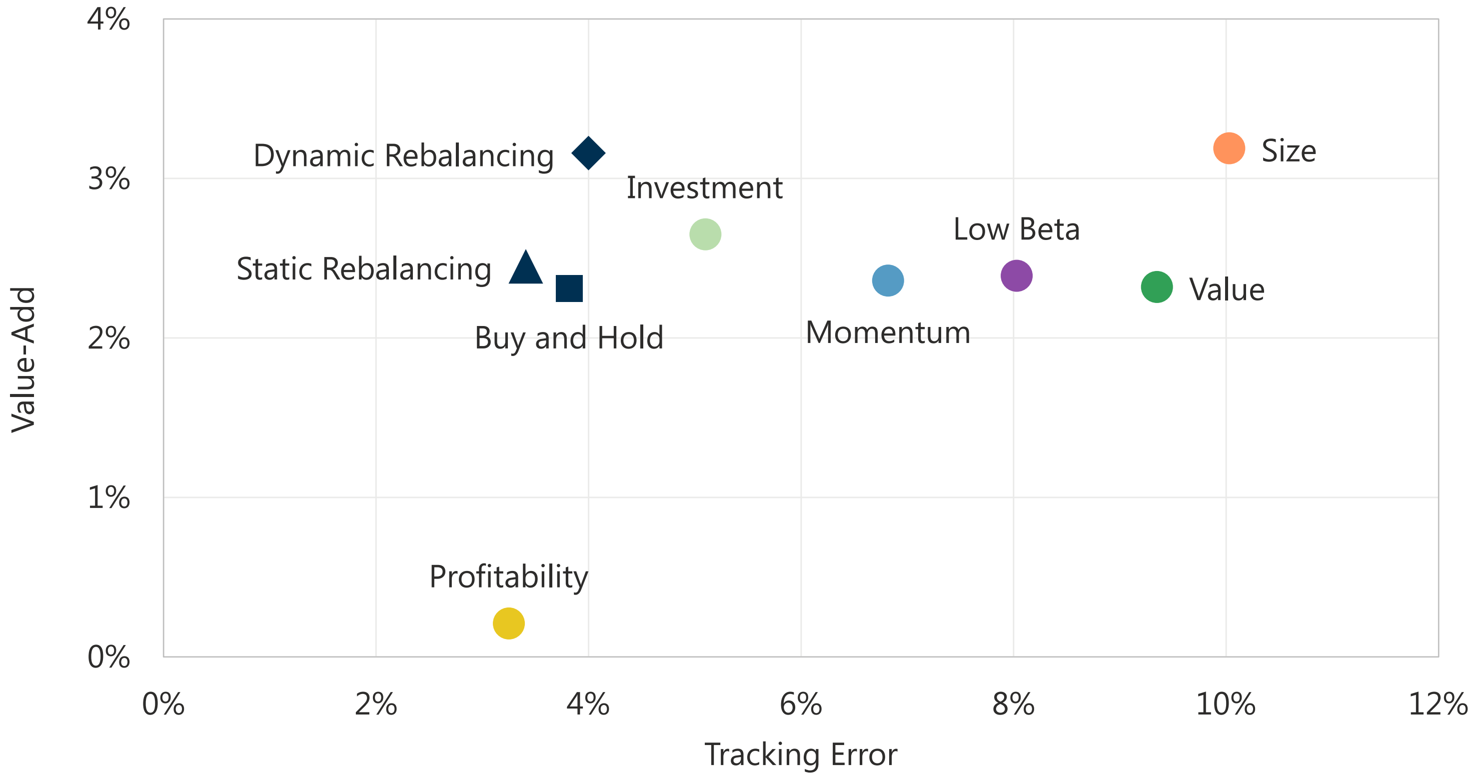
Performance Characteristics of US Multi-Factor Smart Beta Strategies, Jul 1973–Sep 2016



Source: Research Affiliates, LLC, using data from CRSP and Compustat.

Dynamic Multi-Factor Investing Provides a Smoother Ride

US Multi-Factor Smart Beta Strategies Value-Add and Tracking Error, Jul 1973–Sep 2016



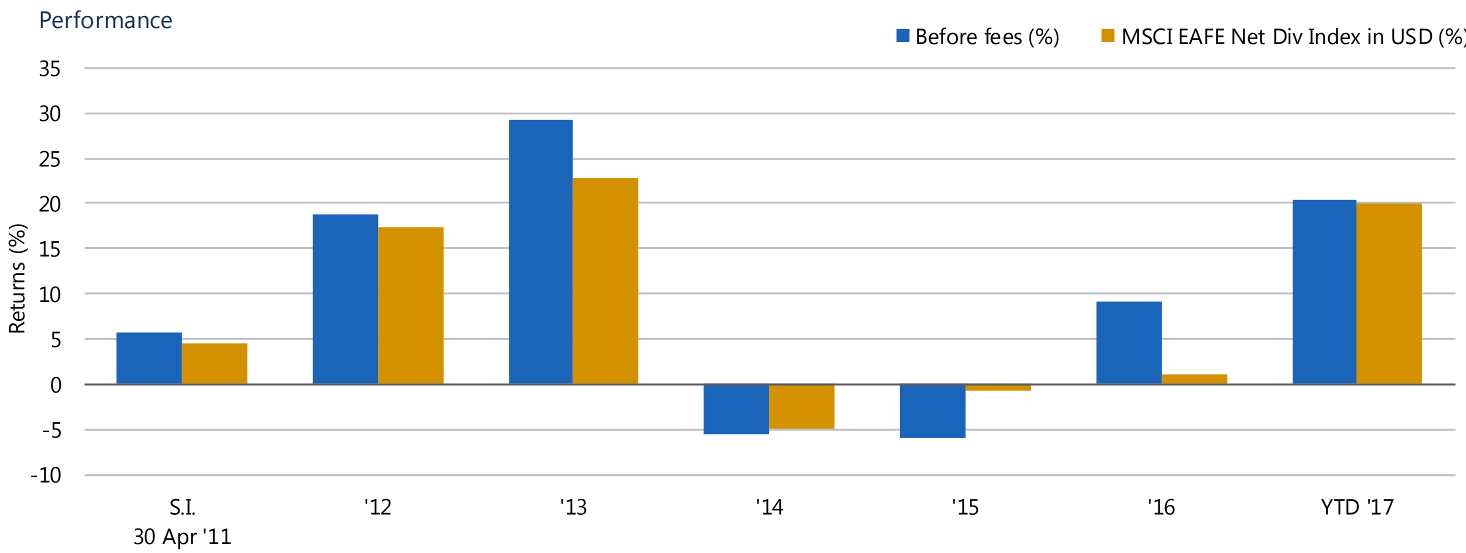
Source: Research Affiliates, LLC, using data from CRSP and Compustat.

Fresno County’s RAE Investment

FCERA - RAE Fundamental International performance review

FCERA - RAE Fundamental International

Market value as of Sep '17	$ 229,940,023



	S.I. 30 Apr '11	5 yrs.	3 yrs.	1 yr.	6 mos.	3 mos.	YTD 30 Sep '17
Before fees (%)	5.70	10.19	5.83	25.38	13.55	7.84	20.36
After fees (%)	5.49	9.95	5.65	25.13	13.44	7.78	20.17
MSCI EAFE Net Div Index in USD	4.42	8.38	5.04	19.10	11.86	5.40	19.96
Before fee alpha vs. core (bps)	128	181	79	628	169	244	40

As of 30 September 2017
All periods longer than one year are annualized.

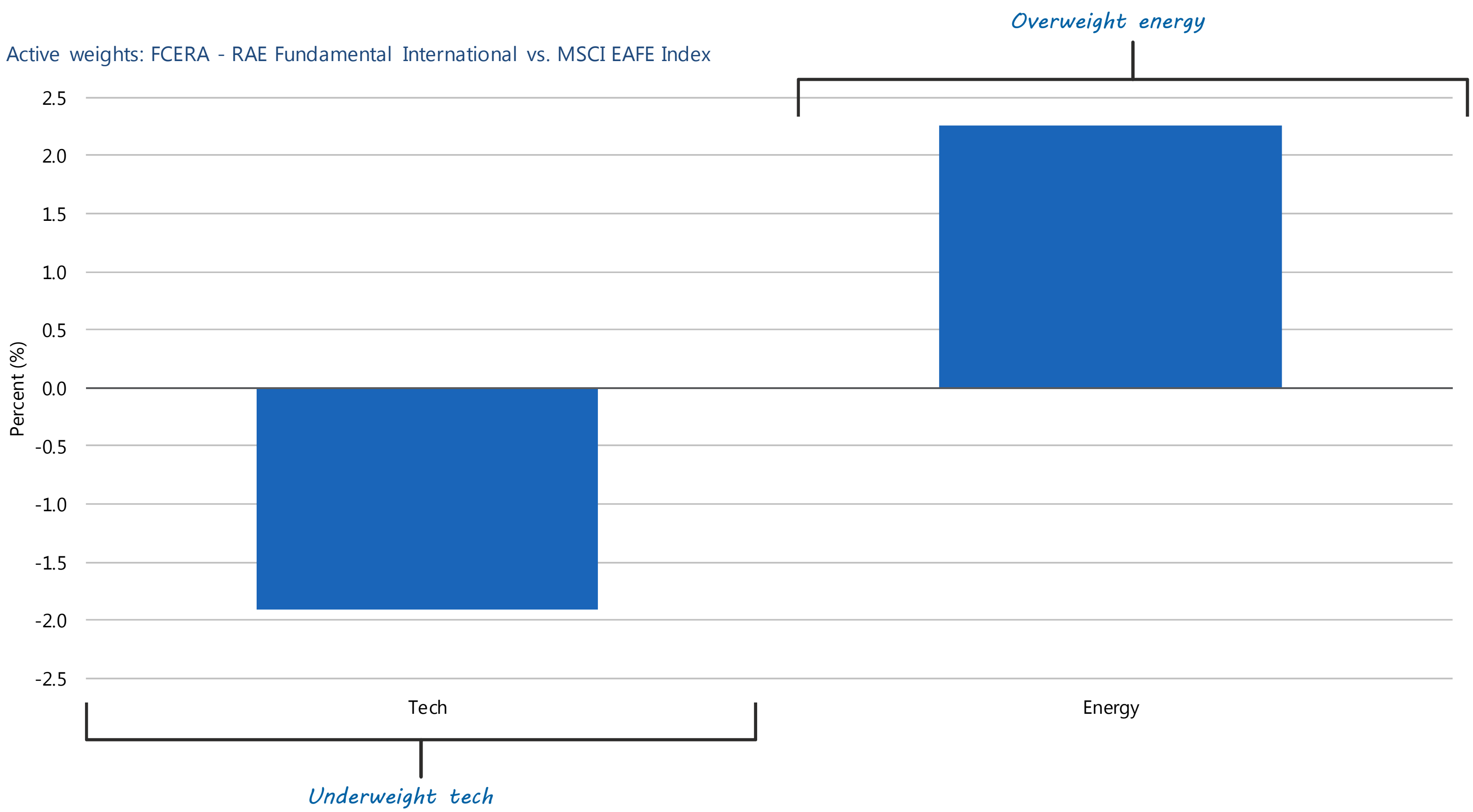
FCERA - RAE Fundamental International vs MSCI EAFE Q3 2017 sector and country attribution

	RAE FUNDAMENTAL INTERNATIONAL		MSCI EAFE		ATTRIBUTION ANALYSIS			
GICS sector	Average weight (%)	Total return (%)	Average weight (%)	Total return (%)	Allocation effect (bps)	Selection + interaction (bps)	Total currency effect (bps)	Total effect (bps)
Consumer Discretionary	10.7	10.5	12.1	7.4	-2	31	1	30
Consumer Staples	5.9	0.47	11.5	0.84	26	-4	1	23
Energy	7.8	15.19	4.8	13.38	18	8	5	30
Financials	30.3	6.10	21.7	5.21	-2	17	12	27
Health Care	5.2	0.44	10.6	0.87	23	-3	4	24
Industrials	13.8	8.41	14.3	6.20	-1	24	6	30
Information Technology	4.4	6.69	6.1	8.55	-6	-3	-3	-13
Materials	10.3	14.50	7.8	11.02	14	33	3	50
Real Estate	1.4	7.40	3.5	3.29	2	6	2	10
Telecommunication Services	3.7	2.27	4.2	1.73	2	1	2	4
Utilities	6.1	7.97	3.4	4.32	-5	19	5	19
Total	**100.0**	**7.74**	**100.0**	**5.40**	**67**	**130**	**37**	**234**

Country	Average weight (%)	Total return (%)	Average weight (%)	Total return (%)	Allocation effect (bps)	Selection + interaction (bps)	Total currency effect (bps)	Total effect (bps)
Top three countries								
Canada	6.85	13.17	0.00	0.00	37	0	13	50
United Kingdom	17.23	7.19	17.72	5.13	2	36	-2	35
Italy	3.67	20.49	2.34	13.96	8	21	2	32
Bottom three countries								
Belgium	0.49	11.91	1.18	9.24	-1	1	-1	-1
Netherlands	2.34	9.03	3.59	9.35	-3	-1	-1	-5
Denmark	0.79	-0.92	1.85	7.71	-1	-7	-1	-9

As of 30 September 2017
SOURCE: PIMCO, FactSet
The attribution analysis contained herein is calculated by PIMCO and is intended to provide an estimate as to which elements of a strategy contributed (positively or negatively) to a portfolio's performance. The attribution results contain certain assumptions that require elements of subjective judgment and analysis. Attribution analysis is not a precise measure and should generally be considered within a range (e.g., +/- 5 bps). Further, attribution analysis should not be relied upon for investment decisions.
Returns are in USD

FCERA - RAE Fundamental International is underweight recently in-favor sectors and overweight the unloved



As of 30 September 2017
SOURCE: FactSet

FCERA - RAE Fundamental International characteristics

Portfolio characteristics	Number of holdings	P/E (Trailing 12-Mo)	P/S	P/B	Dividend yield	Weighted avg market cap ($mm)
FCERA - RAE Fundamental International	701	14.2	0.7	1.2	3.3	44,670.9
MSCI EAFE Index	913	17.2	1.2	1.7	3.0	51,734.8

Top 10 Holdings	RAE (%)	Benchmark (%)
HSBC	2.6	1.4
Banco Santander	2.0	0.8
BP	1.5	0.9
Shell	1.4	1.7
BNP Paribras	1.2	0.6
Sanofi	1.1	0.8
BHP Billiton	1.1	0.5
Societe Generale	1.0	0.3
Barclays	1.0	0.3
Deutsche Bank	0.8	0.3

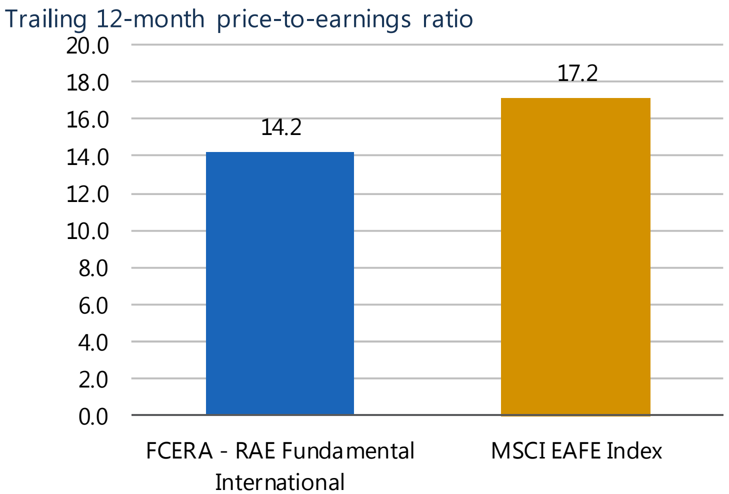
Sector Allocations	RAE (%)	Benchmark (%)
Financials	30.9	21.5
Industrials	13.7	14.4
Consumer Discretionary	11.2	12.2
Materials	9.9	7.9
Energy	7.3	5.1
Utilities	6.0	3.3
Consumer Staples	5.6	11.2
Health Care	5.2	10.6
Information Technology	4.4	6.3
Telecommunication Services	3.6	4.1
Real Estate	1.4	3.5

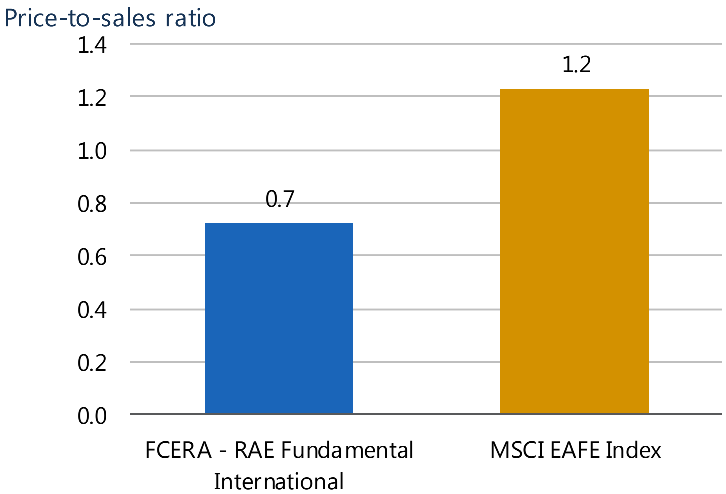
Top 5 countries	RAE (%)	Benchmark (%)
Japan	22.0	23.0
United Kingdom	16.2	16.0
France	11.8	10.5
Germany	10.0	9.7
Canada	6.7	-

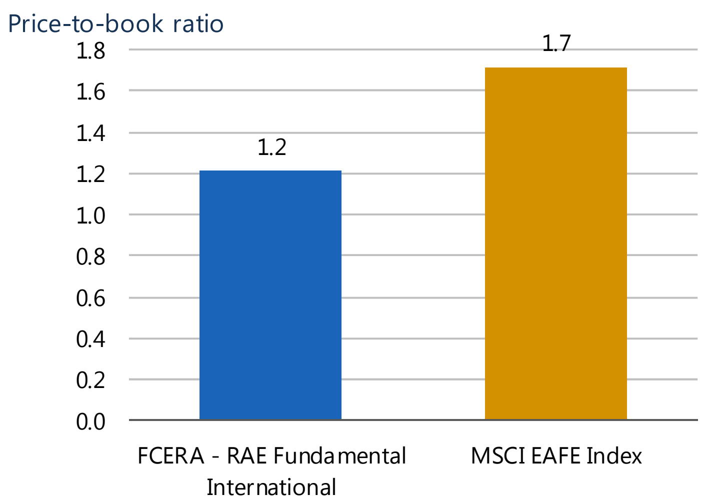
Market Cap Weights ($mm)	RAE (%)	Benchmark (%)
> 50,000	28.4	34.3
10,000 - 50,000	44.2	45.2
2,000 - 10,000	23.4	20.3
0 - 2,000	4.0	0.3

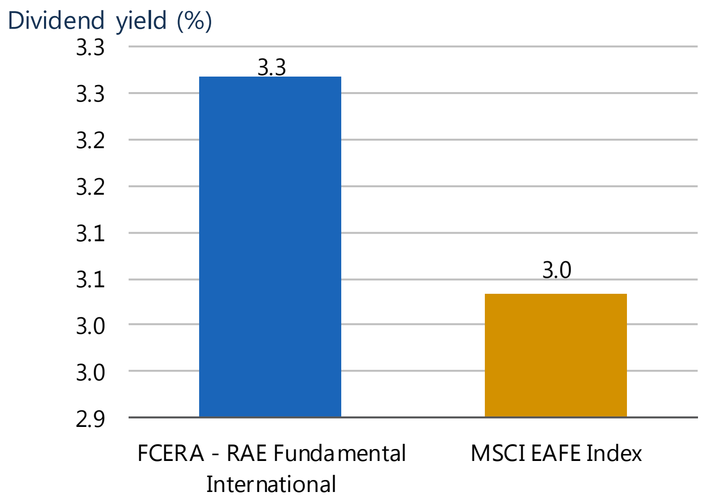
As of 30 September 2017

FCERA - RAE Fundamental International continues to demonstrate an attractive valuation discount









As of 30 September 2017

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Strategy Descriptions

- **RAFI:** Uses the RAFI Fundamental Index methodology as implemented by RAFI Indices, LLC to select and weight companies by four fundamental measures of company size; adjusted sales, cash flow, dividends + buybacks, and book value. Rebalanced annually using a quarterly staggered approach.
- **Equal Weight (Eq Wt):** Uses the S&P 500 Equal Weight methodology to select the top stocks by market cap, equally weight them, and rebalance quarterly.
- **RAFI Low Volatility (RAFI LV):** Uses the FTSE RAFI Low Volatility methodology to select companies according to four fundamental measures of company size: sales, cash flow, dividends, and book value. Stocks are screened for low valuation and low beta and weighted by fundamental weights. Rebalanced annually using a quarterly staggered approach.
- **Minimum Volatility (Min Vol):** Uses the MSCI Minimum Volatility methodology to employ a constrained optimization on the Large+Mid universe to minimize volatility. Constraints include minimum and maximum constituent, country weights, sector weights, and turnover. The optimization is re-computed semi-annually.
- **Low Volatility (Low Vol):** Uses the S&P Low Volatility methodology to select the 100 lowest volatility stocks (200 for Developed and Emerging) from the top cap-weighted index, where volatility is defined as the standard deviation of daily returns over the prior year. Stocks are weighted by 1/volatility and rebalanced quarterly.
- **RAFI Equity Income (RAFI Eq Inc):** Uses the FTSE RAFI Equity Income methodology to select the top 50% of stocks by dividend yield, screen out the bottom quintiles by growth (return on assets), distress (debt coverage ratio), and conservative accounting (net operating assets). Stocks are weighted by the product of RAFI weight and yield and are rebalanced annually.
- **High Dividend (High Div):** Uses the Dow Jones Select Dividend methodology to select 100 stocks by dividend yield from the All Cap universe, after screens for dividend growth and dividend coverage. Stocks are weighted by indicated dividend yield and rebalanced annually.
- **Dividend Growth (Div Gro):** Uses the S&P High Yield Dividend Aristocrats methodology to select all stocks from the top 1500 by market cap that had stable or increasing dividends every year for the last 20 years. The stocks are weighted by indicated dividend yield, and the portfolio is rebalanced quarterly. For Emerging, The S&P Dividend Opportunities methodology is used to select the top 100 stocks by risk adjusted yield. The index is rebalanced semi-annually.
- **Quality (Qual):** Uses the MSCI Quality methodology to select companies from the Large+Mid universe based on a quality score. Quality score combines high return on equity with low debt to equity and low earnings variability. Stocks are weighted by market cap times quality score and are rebalanced semi-annually.

Strategy Descriptions

- **Growth/Stability (Gro/Stblty):** Growth and Stability uses S&P Quality methodology to select the top stocks by quality score from the cap-weighted index. Quality score combines high return on equity with low accruals and low debt to equity. Stocks are weighted by market cap times quality score and are rebalanced semi-annually.
- **Standard Momentum (Std Mom):** Uses the AQR Momentum methodology to select the top third of companies by momentum from the top 1000 stocks by market cap, where momentum is defined as prior year returns skipping the most recent month. Stocks are weighted by market cap and are rebalanced quarterly.
- **Sharpe Ratio Momentum (SR Mom):** Uses the MSCI Momentum methodology to select companies from the Large+Mid universe based on momentum score. Momentum score combines prior 6-month and 12-month Sharpe ratios. Stocks are weighted by market cap times momentum score and are rebalanced semi-annually, with additional ad-hoc rebalances triggered by volatility spikes.
- **RAFI Dynamic Multi-Factor (RAFI DMF):** RAFI Dynamic Multi-Factor Index methodology to dynamically weight the RAFI Value Factor, RAFI LV Factor, RAFI Quality Factor, RA Momentum Factor, and RAFI Size Factor Indices based on long-term reversal and short term momentum. Dynamic allocations are adjusted quarterly.
- **Scientific Beta 6-Factor Equal Weight (SciBeta 6 Factor):** Uses the EDHEC SciBeta Six-Factor methodology to equally weight six factor indices: value (top half by Book/Price), momentum (top half by prior-year return, skipping most recent month), mid-cap (bottom half by market cap), low volatility (bottom half by prior two-year standard deviation of weekly returns), profitability (top half by Gross Profits/Assets), and investment (bottom half by asset growth). Stocks within each factor are diversified via five diversification methods. The portfolio is rebalanced quarterly.
- **Quality/Value/ Low Volatility (Qual/Val/Vol):** Uses the MSCI Factor Mix A-Series index methodology to equally weight the Quality Index, Fundamentally Reweighted Index, and Minimum Volatility Index.

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