Seduced by Theory: Why Most Investors Buy High and Sell Low

Rob Arnott
arnott@rallc.com

March 15, 2017
Grant's Spring Conference

research™ affiliates

Are We Blinded by Theory and Drawn Away from Thinking?

Theory is not fact; it describes an ideal world

- » Theories are often provable, based on an array of assumptions;
- » But, some of the assumptions are often *wrong*.

Gaps between theory and reality are normal

- » No theory can fully capture how the real world works;
- » Worse, the real world can present us with objective facts that contradict what theory predicts.

Still, many of us get easily seduced by theory and cling to theory as fact

- » Assume a theory is correct description of reality
- » Assume that, therefore, the assumptions are correct
- » Assume that empirical evidence to contrary is wrong
- » This is exactly backwards!

Is Cap-Weighted Indexing Sensible, Flawed, or Both?

The Efficient Market Hypothesis

- Conflicts with behavioral finance
- Contradicted by countless empirical tests
- At odds with observed reality (e.g., Black)
- Fails the "$100 bill" paradox
- James Montier: Monty Python's Dead Parrot
- David Hirshleifer: The Triumph of DMH and DAPM

Cap-weighted indexing depends on EMH and is flawed

- Cap-weighted index will overweight all overpriced stocks and underweight all underpriced stocks, creating a return drag.
- Those who believe that market is efficient and invest in cap-weighted portfolios end up "*buying high and selling low*."

Easiest way to outperform the cap-weighted markets?

- Sever the link between share price and the portfolio weight.

Fundamental Index™: Weight by Any Measure of Company Size Except Market Capitalization

Sales

Cash Flow

Dividends

Book Value

Outperformance vs. cap-weighted benchmark

Benefits

Low turnover & trading costs

High capacity

Broad economic representation

How Does Human Nature Condition Us to "Buy High and Sell Low"?

Past return is *worse* than useless

- » Many prefer comfort, chasing what is popular and loved.
- » Few have the courage to pursue what is out of favor.

Performance chasing is a proven path to disaster

- » Bargains do not exist without fear.
  - » Whatever is newly expensive has two attributes: wonderful past returns and lousy future returns.
  - » Whatever is cheap became cheap by treating us badly in the past, but is likely priced to deliver superior returns.

Watch Out for Trend Chasing—It's Everywhere

Practitioners look for best historical performance.

Academics 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]

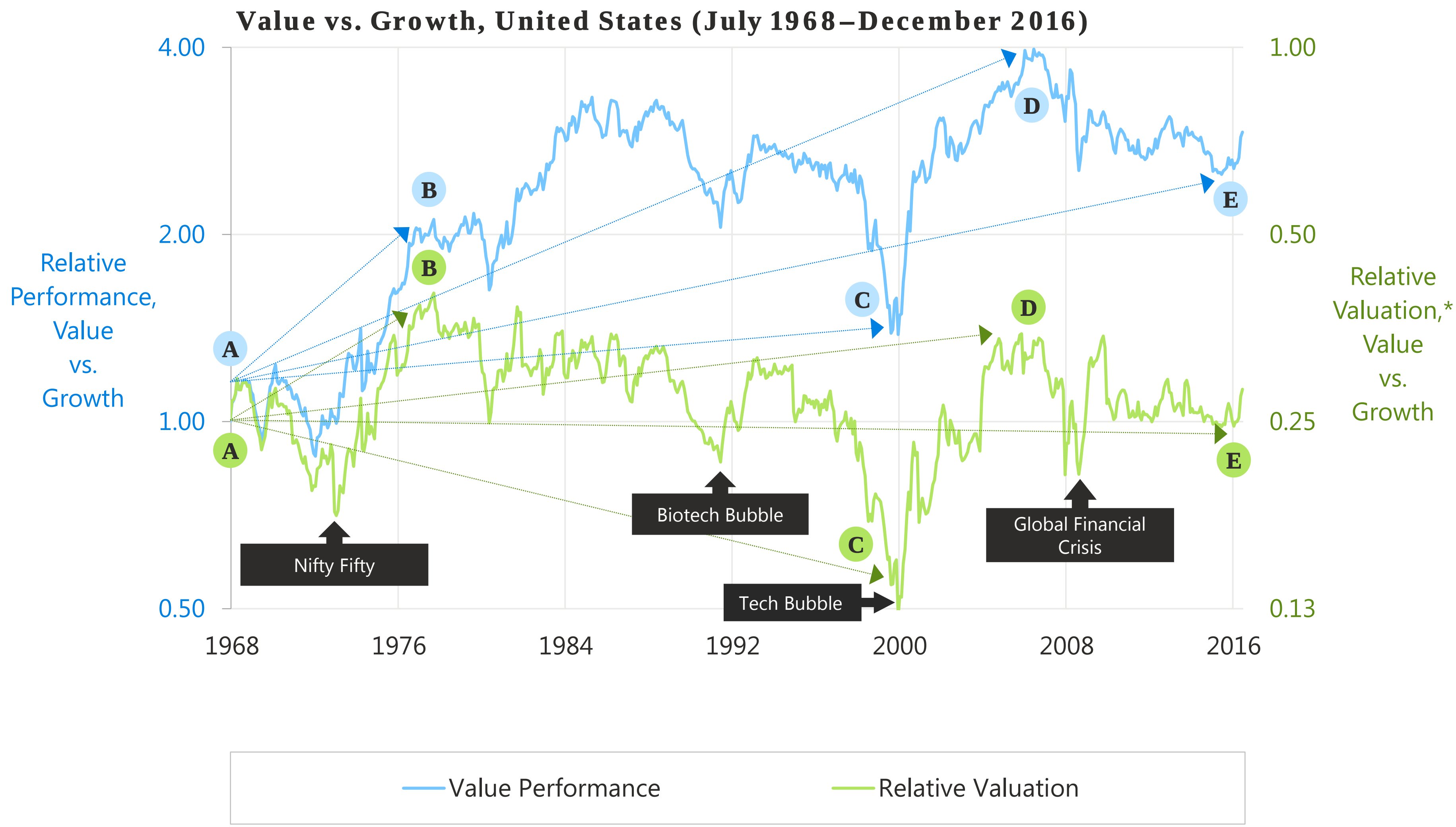
1. Harvey, Liu, Zhu (2015); Beck, Hsu, Kalesnik, Kostka (2016).
2. Fama, French (2002); Arnott, Bernstein (2002); Campbell, Shiller (1988); Cochrane (2008).

Alpha Decomposition

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

- **Alpha due to change in relative valuation**
  - is mean reverting and averaging 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 **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.

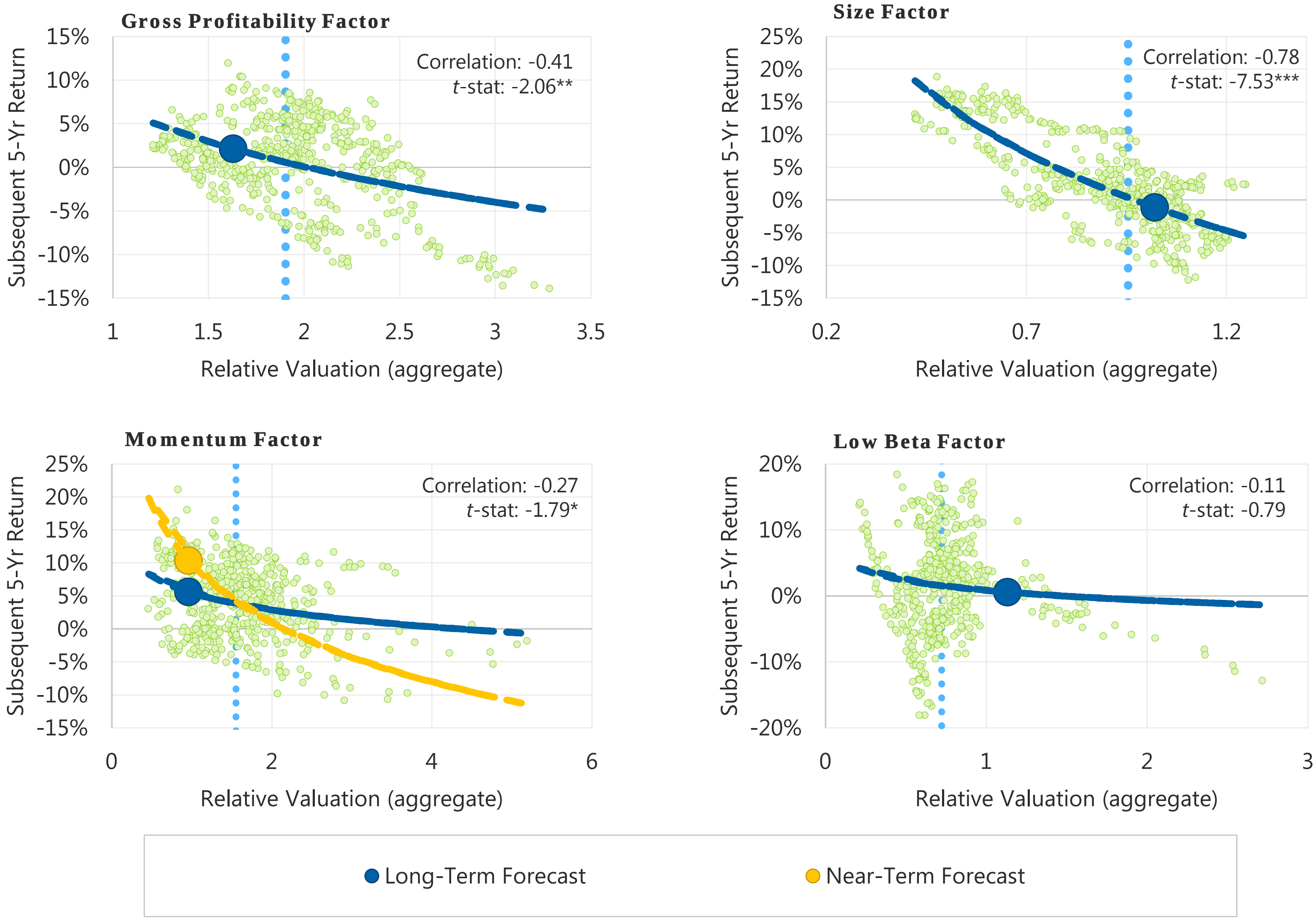
Full-Sample Factor Returns

United States (Jul 1968–Dec 2016)	Value (B/P)	Value Composite	Momentum	Illiquidity	Low Beta	Gross Profitability	Investment	Size
Long-Term Return	2.01%	2.24%*	3.03%*	2.07%**	1.51%	0.64%	2.53%**	1.71%
Return from Changing Valuation	0.95%	-0.22%	0.44%	0.43%	0.57%	-0.81%	0.61%	0.50%
Performance, Net of Valuation Change	1.06%	2.46%*	2.59%*	1.63%	0.94%	1.45%	1.92%*	1.21%

*, **, *** *Two-tail significance at 90%, 95%, and 99%, respectively.*

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

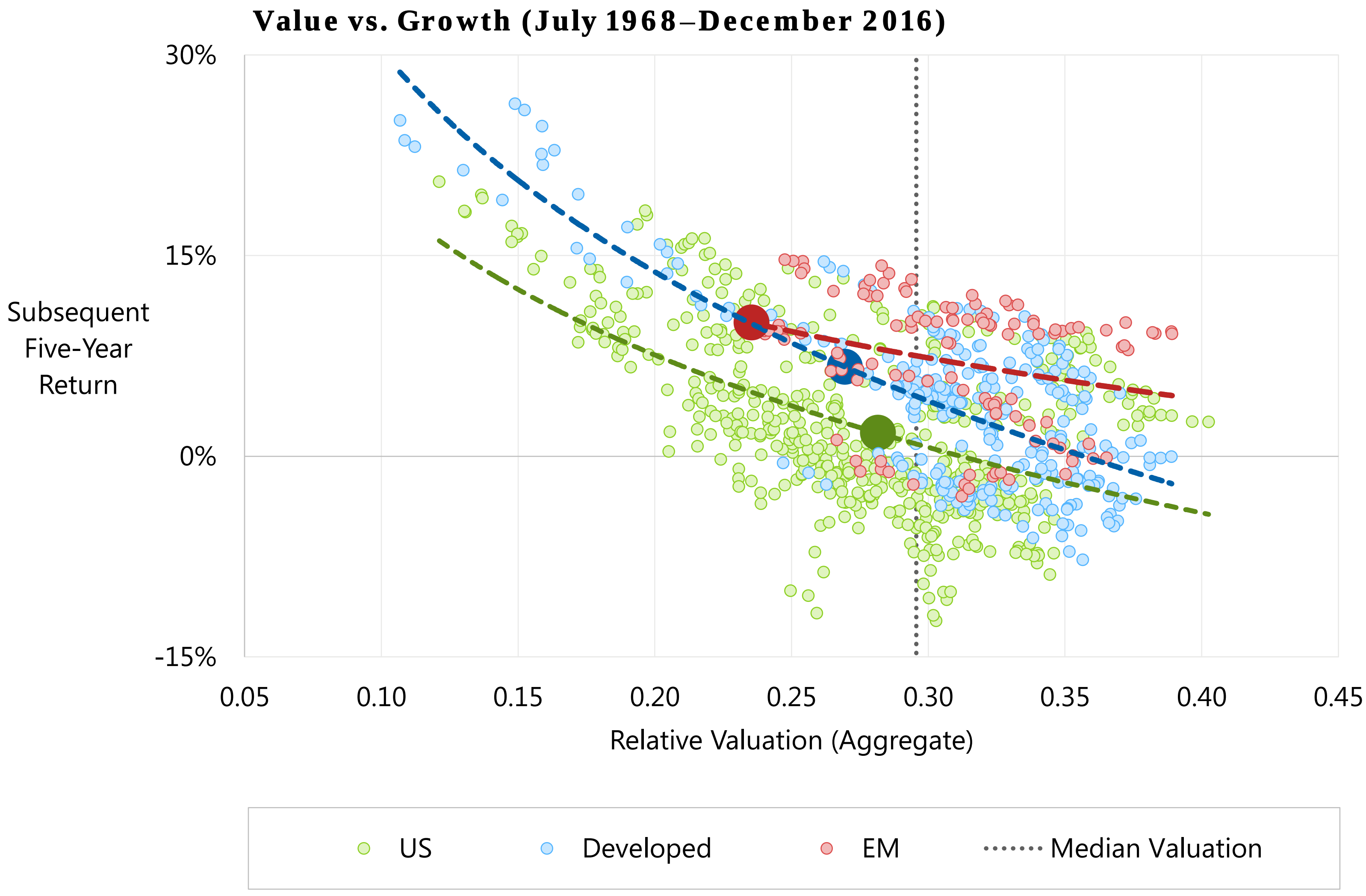
Factor Valuations Are Predictive of Future Returns: *Value*



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

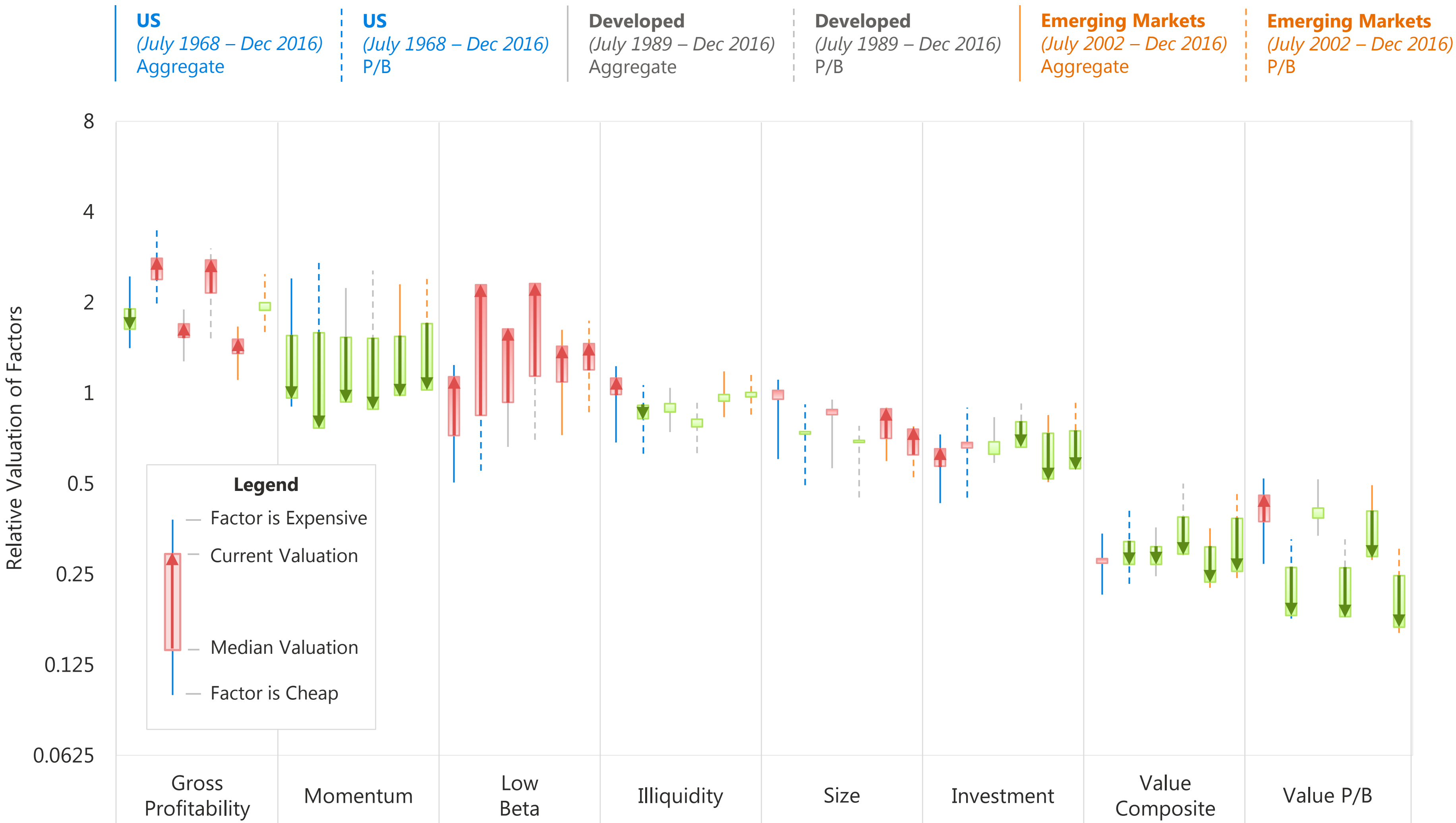
Two-Tail statistical significance: * = 10% threshold; ** = 5% threshold; *** = 1% threshold.

Factor Valuations Are Predictive of Future Returns: *Value*



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

Where Are We Today?

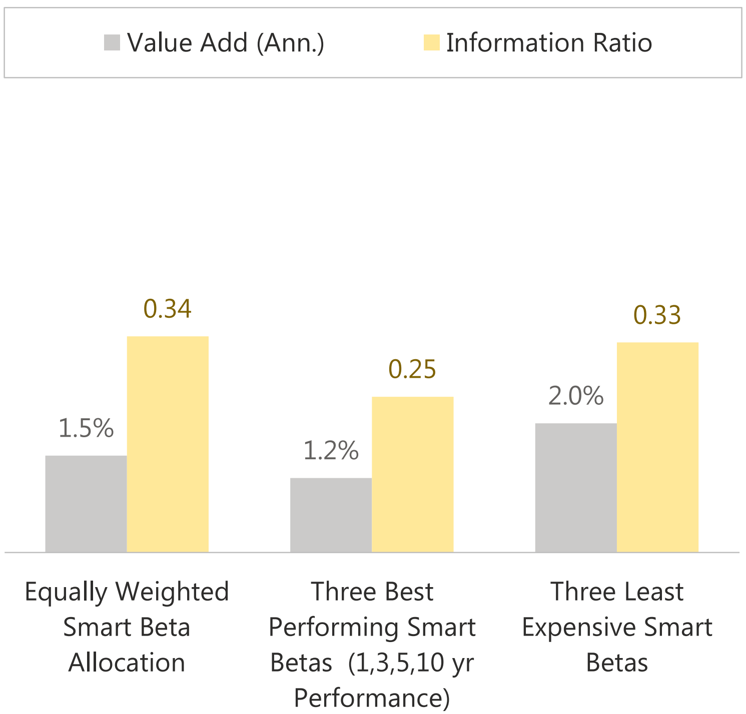


Source: Research Affiliates, LLC, using data from CRSP and Compustat.

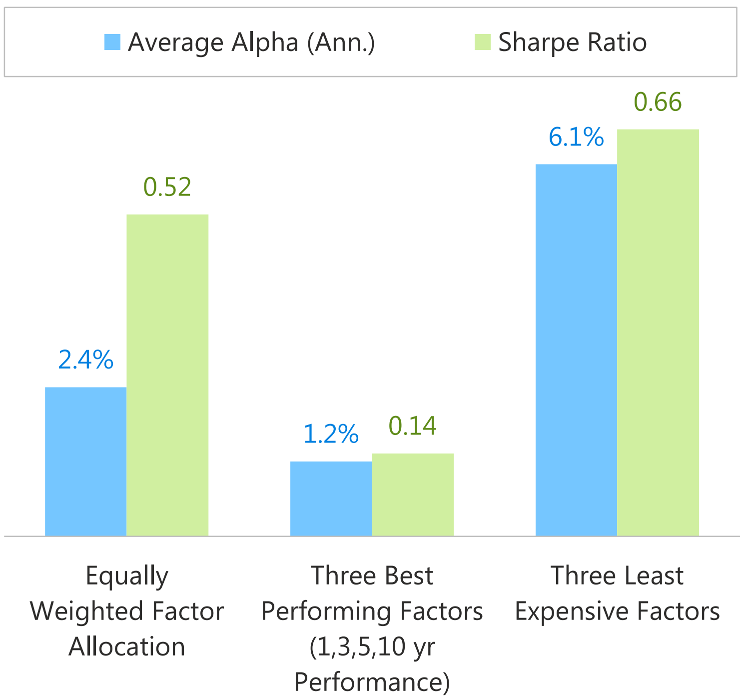
Trend Chasing is Costly

Performance Characteristics of Trend-Chasing and Contrarian Allocations, United States (Jan 1977–Aug 2016)

Smart Betas
Trend-Chasing and Contrarian Strategies



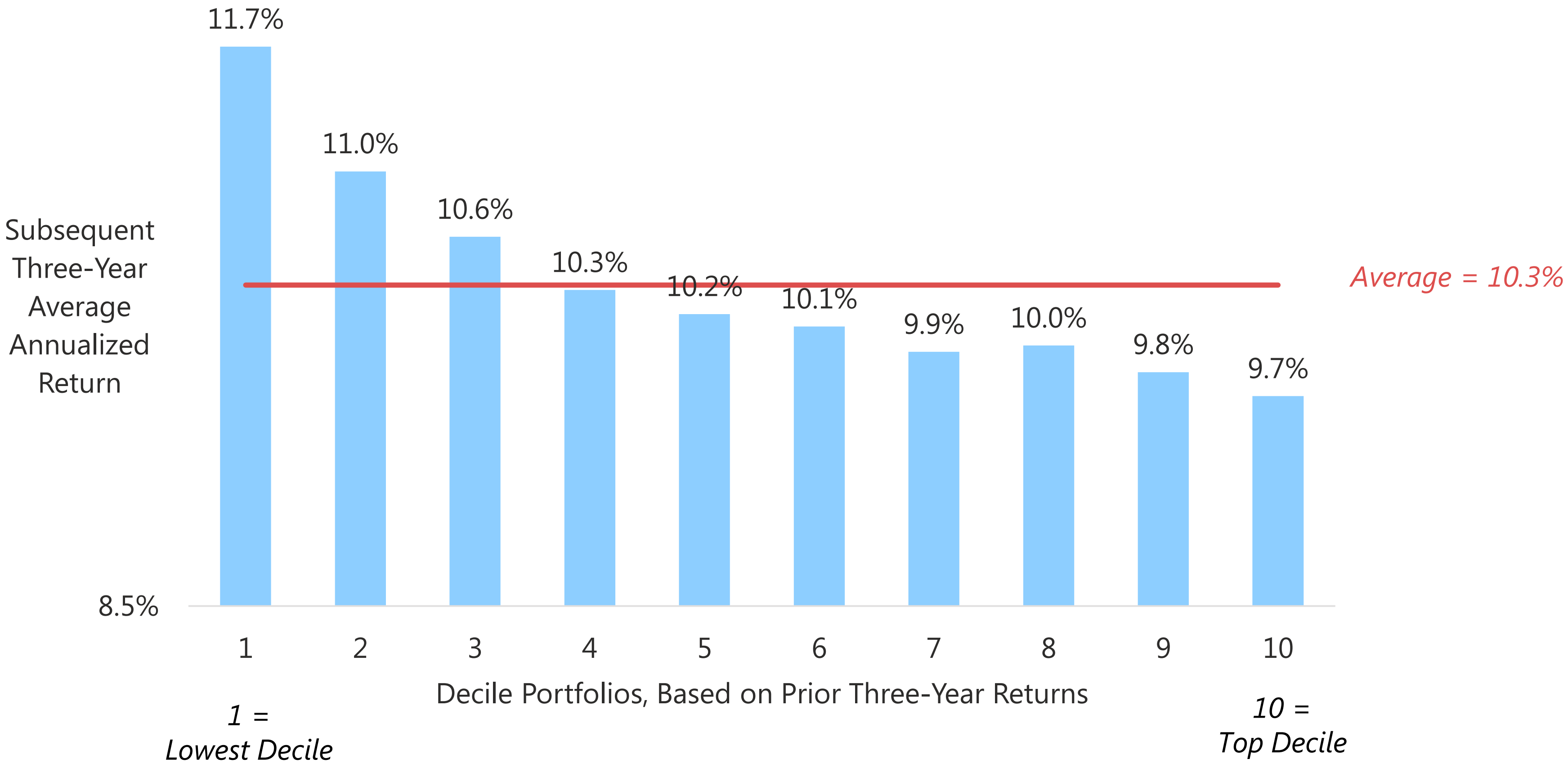
Factors
Trend-Chasing and Contrarian Strategies



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

Contrarian Investing Adds Value

Average Mutual Fund Subsequent Three-Year Performance, Sorted by Prior Three-Year Returns, US Long-Only Equity Funds (Jan 1990–Dec 2016)



Source: Research Affiliates, LLC, based on data from Morningstar Direct.

What to Watch Out for Today?

Mark Twain:

“History may not repeat, but it sure rhymes”

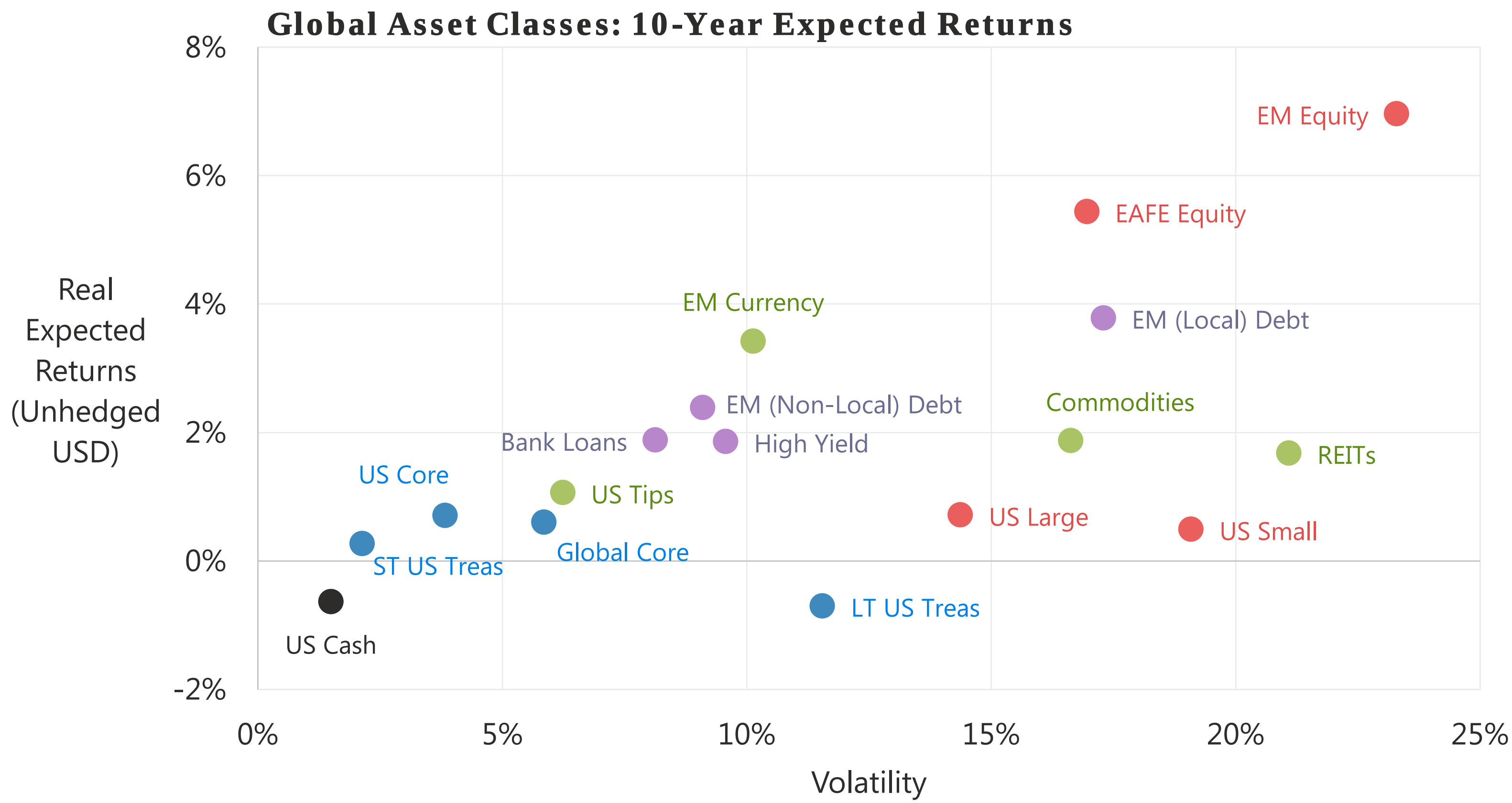
This Time Is Different?

- It’s <u>always</u> (just a little bit) true
- The slogan used to justify crashes, to support bubbles, despite the vast evidence to the contrary

Mean reversion is a powerful force in the capital market

- Peak profits can mean-revert
- Can affect cyclical stocks
- Can affect markets at cyclical peaks
- Watch out for mean reversion in profits and profitability

Research Affiliates Asset Allocation Site



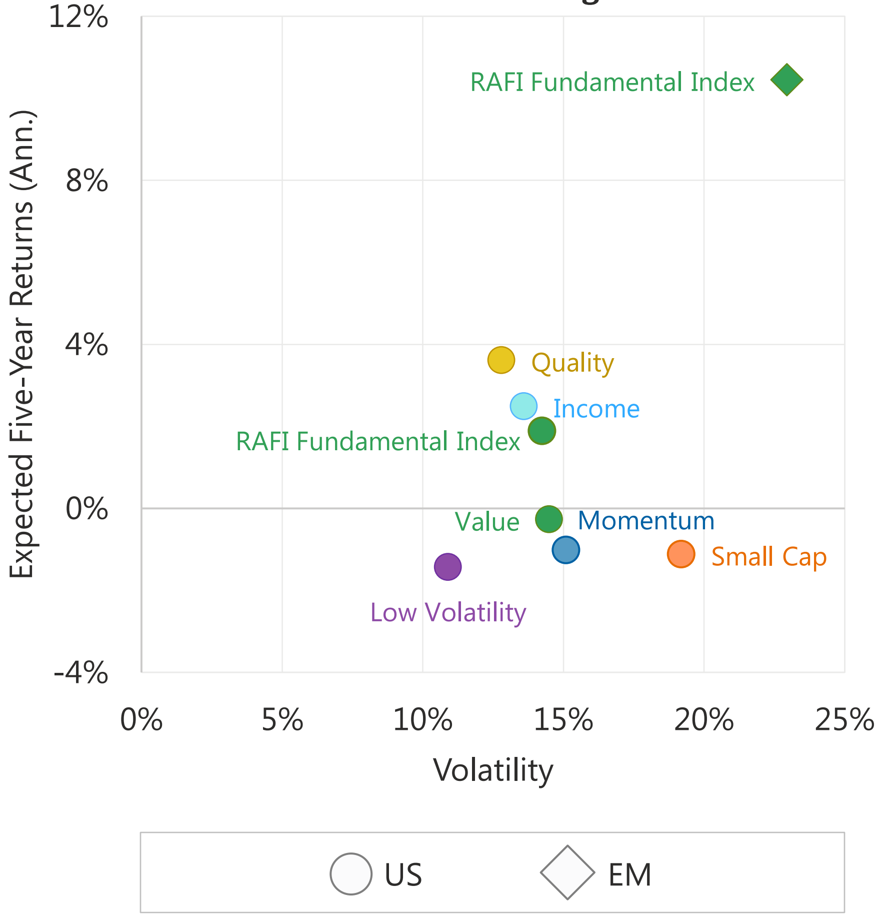
As of 02/28/2017.

Source: These expected returns are calculated by Research Affiliates, LLC, using data provided by MSCI Inc., Bloomberg, and Barclays.

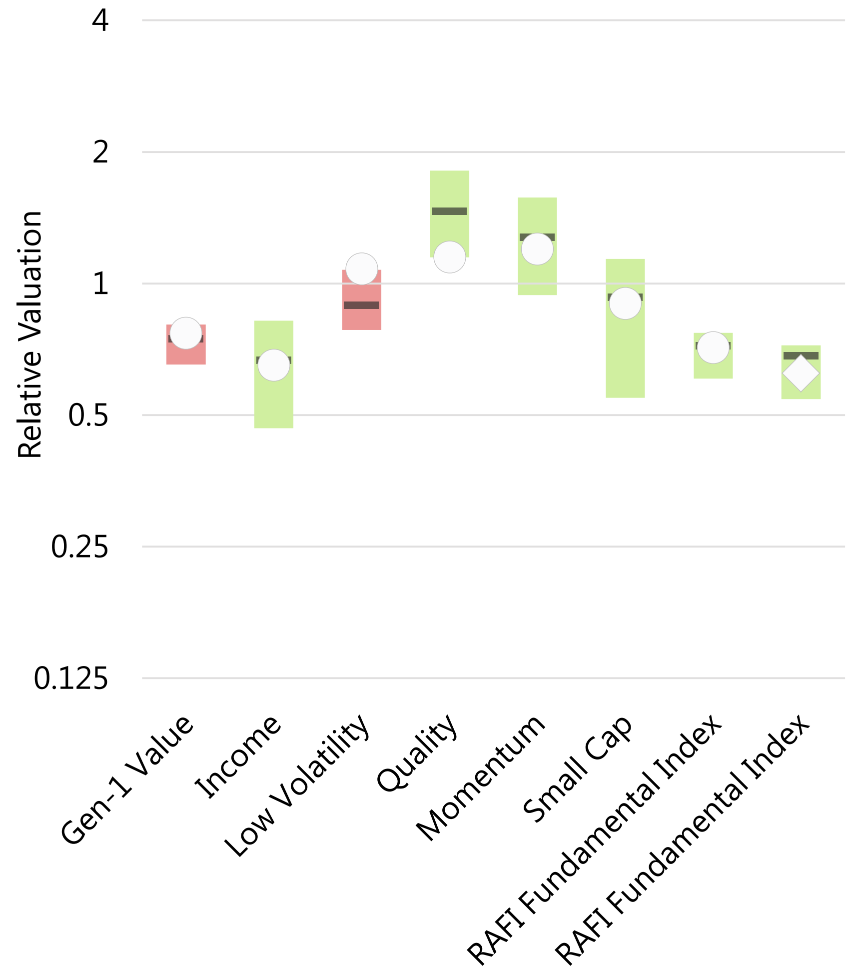
Note: Volatility is measured as standard deviation. These forecasts are forward-looking statements based upon the reasonable beliefs of RA and are not a guarantee of future performance. This content is not investment or tax advice or an offer, sale or any solicitation of any offer to buy any security, derivative or any other financial instrument. Any use of the above content is subject to and conditioned upon the user's agreement with all important disclosures, disclaimers and provisions found at www.researchaffiliates.com/en_us/about-us/legal.html. In the event the above content is provided or modified by a third-party, Research Affiliates, LLC, fully disclaims any responsibility or liability for such content.

Research Affiliates Smart Beta Interactive Site

Real Long-Term Expected Return, Net of Transaction Costs, Select Smart Beta Strategies

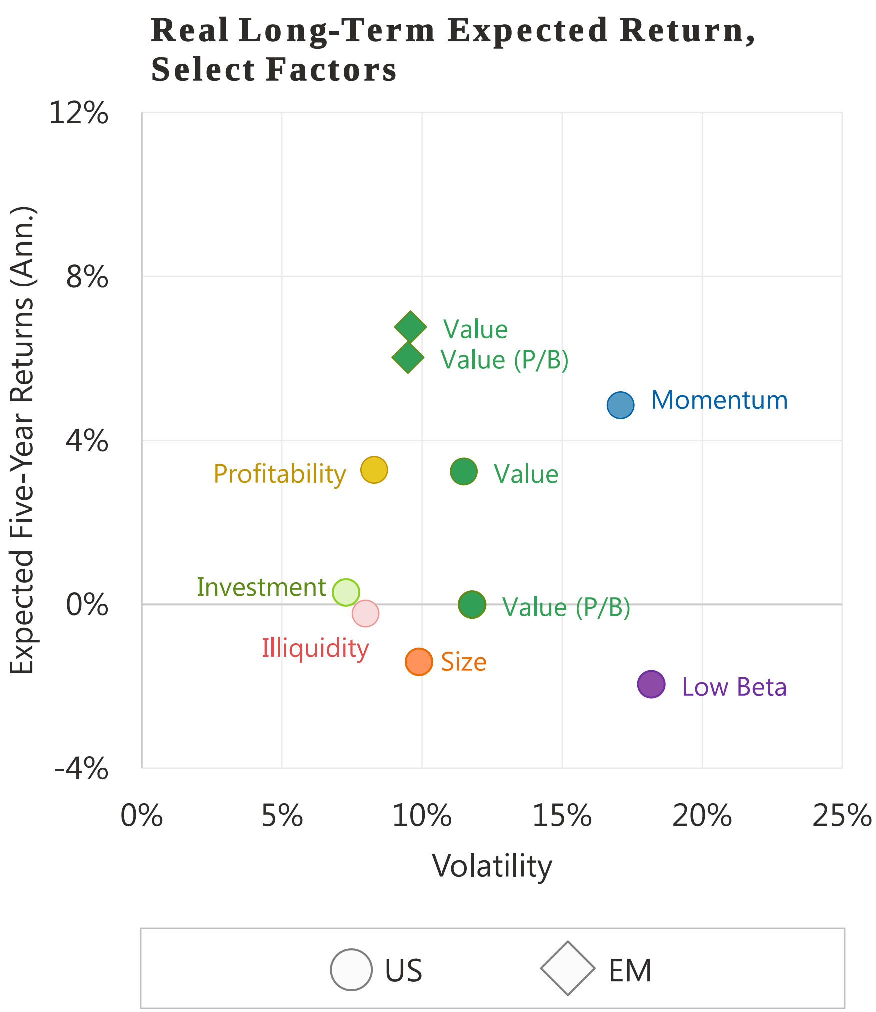


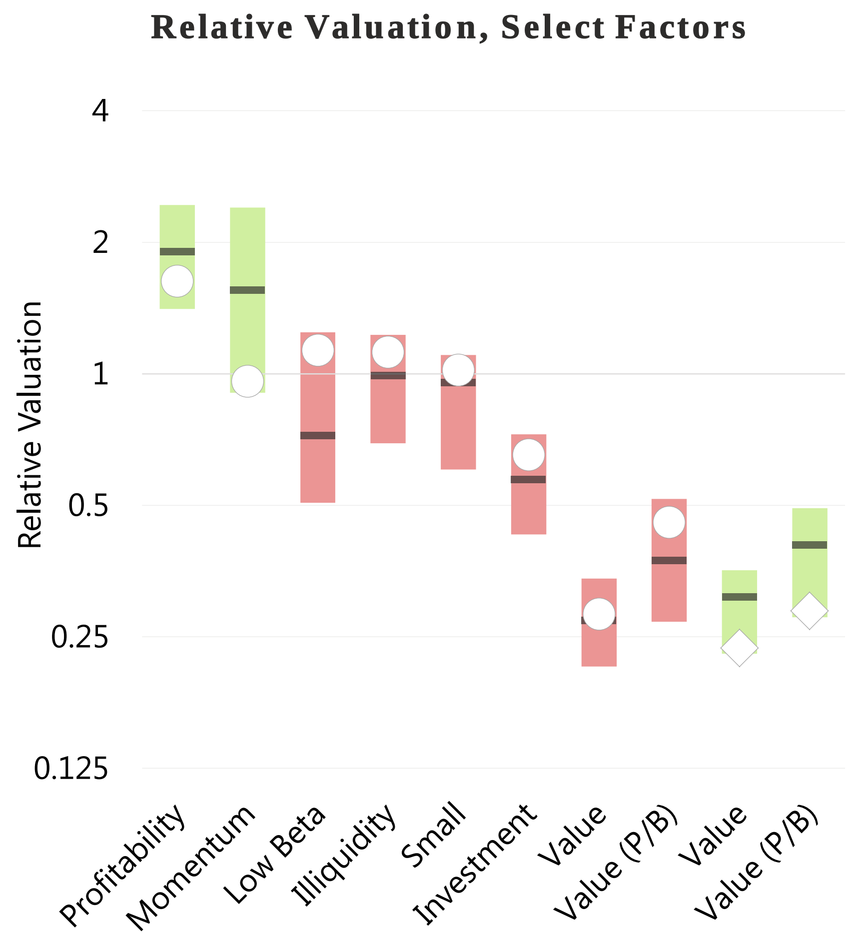
Relative Valuation, Select Smart Beta Strategies



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

Research Affiliates Smart Beta Interactive Site





Thank You

www.ResearchAffiliates.com

@ra_insights

research-affiliates

Important Information

All data presented on the Smart Beta Interactive website is based on simulated portfolios computed by Research Affiliates LLC ("RA") using data from CRSP, Compustat, Worldscope, Datastream, and Bloomberg. The portfolios shown do not represent the results of live, investable portfolios, and this content is not investment or tax advice or an offer, sale or any solicitation of any offer to buy any security, derivative or any other financial instrument. All expected return forecasts are forward-looking statements based upon quantitative models developed by Research Affiliates LLC and is not a guarantee of future performance. All past returns of the strategies and factors are not a guarantee of future performance. All transaction cost estimates are based upon quantitative models developed by RA and could differ from actual experienced transaction costs in the future. All volatility, beta, and tracking error expectations are based upon an exponential decay-weighted estimation of recent volatility, beta, and tracking error and are not a guarantee of future volatility, beta, or tracking error.

Expected return forecasts come with multiple sources of uncertainty. The expected returns model used on this site estimates higher expected returns when the strategy or factor is valued below its historical norm and vice versa. However, cheap strategies can always get cheaper, resulting in poor returns when this site projects high returns. Expensive strategies can always get more expensive, resulting in high returns when this site projects poor returns. The choice of expected returns model itself is also a source of uncertainty. Model parameters were estimated using a finite amount of data and are therefore subject to estimation error. Model specification choices such as when and how to shrink parameter estimates could result in different expected return outputs than are generated by the model used here.

The data sources (CRSP, Compustat, Worldscope, Datastream, and Bloomberg) used to construct and evaluate portfolios may contain multiple errors. These errors may bias up or down performance of certain strategies or factors compared to what an actual investor would have been able to achieve in the real market. Further, the simulation results ignore management fees, costs of shorting and other potentially very important elements which may make the live portfolio outcome different from the theoretically simulated portfolio. Smart beta or factor tilt investing strategies are subject to all the risks common to equity investing such as loss of capital. They are also subject to risks that are unique to smart beta investing. The choice of which factor or factors to tilt toward or away from can result in strategies that either beat or lag the market. The factors chosen for study by academics and the strategies chosen for investment allocation by practitioners are typically noticed after periods of good performance. This has at least two consequences: 1) investors are likely to overestimate the performance that a given strategy can provide over the long term and 2) good recent performers are likely to be expensive and to mean-revert to cheaper valuations, causing poor future performance. Past 5-year historical data is included on this site not as an indication of what to expect going forward, but to provide contrast with expected returns which are based on valuations and will often be inversely related to prior 5-year performance.

Equity factors themselves, constructed on this site as long/short portfolios are often not implementable and not offered as investable equity products. Nevertheless, there are risks associated with individual equity factors that are also borne by investments that tilt their holdings toward these factors. Investing in factors can subject investors to unique risks that include, but are not limited to, the following: Momentum strategies invest in recent winners that tend to continue outperforming, however when the market changes direction momentum investors are subject to a quick burst of severe underperformance known as a momentum crash. Low beta or low volatility strategies have lower absolute risk than the market, but typically come at the cost of higher relative risk and low vol strategies tend to have higher tracking error, which represents the risk that the strategy deviates from the market for extended periods of time. Value strategies often have prolonged periods of underperformance sometimes followed by quick bursts of outperformance. Value investors who reduce their value exposure following periods of value underperformance run the risk of mistiming their exposure and missing out on the periods when the value factor recovers. The profitability factor often invests in more expensive companies and high corporate profits can mean revert to lower profits in the future due to increase in competition or decrease in barriers to entry. Investing in profitable companies at any cost runs the risk of overpaying for expected future profits. The illiquidity factor earns a premium by providing liquidity but leaves illiquidity-tilted investors prone to liquidity shocks that could lead to high costs of exiting the position. The investment factor tilts toward companies with lower asset growth which could run the risk of missing out on potential growth opportunities. Tilting toward the size factor by investing in small cap stocks can provide diversification away from large caps, but often comes with higher portfolio volatility, potentially lower liquidity, and higher transaction costs.

The methodologies displayed are based upon our interpretation of the publicly available information regarding several cited indices and because all details about the construction of these mentioned indices are not publicly available, there are differences between those mentioned indices and our interpretation and application of these indices. In addition to factors – theoretical, generally hard to replicate long-short portfolios – we estimate expected risk/return characteristics for a collection of the more popular smart beta strategies. In order to produce forecasts we replicated the strategies using the published methodologies of the underlying indices. Any replication exercise is subject to deviation from the original due, in part, to differences in databases, rebalancing dates, interpretations of the written methodologies, and omitted details in the methodology description – our replication is no exception. The results of the replicated exercise albeit imprecise should be informative of the underlying strategies.