PORTFOLIO
MANAGEMENT
RESEARCH

the journal of PORTFOLIO management

QUANTITATIVE STRATEGIES: *FACTOR INVESTING*

6TH EDITION

volume **47** *number* **2**

JANUARY
2021

jpm.pm-research.com

Is (Systematic) Value Investing Dead?

Ronen Israel, Kristoffer Laursen,
and Scott Richardson

AQR

Is (Systematic) Value Investing Dead?

Ronen Israel, Kristoffer Laursen, and Scott Richardson

Ronen Israel
is a principal at AQR Capital Management, LLC in Greenwich, CT.
ronen.israel@aqr.com

Kristoffer Laursen
is an executive director at AQR Capital Management, LLC in Greenwich, CT.
kristoffer.laursen@aqr.com

Scott Richardson
is a principal at AQR Capital Management, LLC in Greenwich, CT, and a professor at London Business School in London, UK.
scott.richardson@aqr.com

KEY FINDINGS

- The authors address a series of possible (ex post) rationalizations of the recent underperformance of value strategies. They find little empirical evidence or theoretical foundation to support the criticisms.
- Building on prior academic research, the authors find strong evidence that fundamental information is relevant for stock prices.
- However, the authors find that there are periods in which stock prices become less connected to fundamental information; when value underperforms significantly, it is primarily attributable to a widening gap between prices and fundamentals.

ABSTRACT

Value investing involves buying securities that appear cheap relative to some fundamental anchor. For equity investors, that anchor is typically a measure of intrinsic value linked to financial statements. Recently, much has been written about the death of value investing. Although undoubtedly many approaches to value investing have suffered recently, the authors find the suggestion that value investing is dead to be premature. Both from a theoretical and empirical perspective, expectations of fundamental information have been and continue to be an important driver of security returns. The authors also address critiques leveled at value investing and find them generally lacking in substance.

TOPICS

*Analysis of individual factors/risk premia, factor-based models, fundamental equity analysis**

This is a dedicated piece about value investing in equity markets. The efficacy of value investing has been shown across many markets (e.g., Asness, Moskowitz, and Pedersen 2013), including stocks, bonds, currencies, and commodities, but our focus here is the equity market. Why? First, the performance of value strategies in equity markets has been poor for the last decade. Second, the equity market is where academics originally documented the existence of a return premium associated with value. The question we aim to address is whether value investing is now dead. Is a decade of underperformance for some well-known value strategies enough to throw in the towel (see, e.g., Fama and French 2020)? Is it the case that the strategy no longer works because (1) everyone knows about it or (2) times are different after the financial crisis (e.g., lower interest rates or changing business models in the new economy)?

*All articles are now categorized by topics and subtopics. **View at PM-Research.com**.

What we have to say about value investing is not limited to systematic implementations of value portfolios (i.e., portfolios of stocks sorted on measures like book-to-price [B/P] and earnings-to-price [E/P]). We speak to the continued importance of fundamental information, and expectations thereof, for the determination of stock prices. Fundamental information related to firms' business models should be at the heart of every investor's toolkit. Value investors challenge the expectations of discounted cash flows implicit in price with their own view of the firm's potential to generate cash flows (i.e., intrinsic value), with an expectation that price will revert to their view of intrinsic value. Where does such an "intrinsic" view come from? It comes from a deep understanding of the value creation potential of that firm, encompassing an understanding of the goods and services a company provides, the competitive landscape in which that firm operates, the potential for growth in the current (and future) mix of goods and services, and the associated changes in margins, required capital, and financing choices to deliver on that growth.

We start our piece with a short refresher on equity valuation models (discounted dividends and residual income valuation approaches), the purpose of which is a simple reminder of what you get when you buy a share: You are purchasing the right to participate in the dissemination of future free cash flows. An active investor wishing to challenge the market price may view intrinsic value as differing from the actual share price owing to different views on either future free cash flows or the rate at which they are discounted. Empirically distinguishing between these two sources of difference is virtually impossible, but it is useful to remind ourselves of this joint forecasting challenge. A value investor may be harvesting returns that compensate for (1) errors in expectations with respect to fundamentals, (2) a risk premium for exposure to stocks that share exposure to a nondiversifiable source of risk that is reflected in their current cheapness, and/or (3) a premium for investors who are willing to overpay for growth or avoid value (i.e., non-risk-based preferences).

Systematic implementations of value investing can be thought of as a reduced form approach to a more general equity valuation. A portfolio that is long (short) stocks with high (low) values of B/P or E/P is the canonical systematic value portfolio. The fundamental anchor in these systematic value approaches is typically current book value or current earnings (or cash flows or sales), or perhaps near-term forecasts of earnings (or cash flows or sales). This approach is deliberately simplistic and may miss subtleties of equity valuation including (1) future earnings growth, particularly long-term growth, and its associated risks, and (2) potential accounting distortions due to time-varying and cross-sectional differences in how the conservative accounting system records transactions and allocates revenues and expenses across fiscal periods. The efficacy of value strategies is supported even with these simplifications. For example, in the cross section of stocks, expectations of longer-term growth tend to be too optimistic (e.g., Lakonishok, Shleifer, and Vishny 1994; Dechow and Sloan 1997), and differences in accounting treatment can be mitigated via portfolio construction choices that compare relatively homogeneous sets of firms cross-sectionally (e.g., industry adjusting, as done by Asness, Porter, and Stevens 2000) and possibly via correcting for any known distortive effects of the accounting system. Our purpose here is not to describe all such modifications in identifying intrinsic value but rather to present the case for value investing.

Despite decades of evidence supporting the efficacy of systematic versions of value investing across (1) many stock markets (developed and emerging), (2) many time periods (both before and after the publication of the original papers), and (3) other asset classes (government bonds, corporate bonds, currencies, and commodities), the recent evidence for value strategies in equity markets, particularly in the United States, has been poor. That may be an understatement, as 2018, 2019, and 2020 have been extremely painful years for value strategies generally (following a pretty poor period since the Global Financial Crisis). This has prompted a series of ex post rationalizations (perhaps critiques) to try and explain the underperformance of value strategies and in so doing call into question their continued efficacy. These criticisms include the following: (1) B/P has not really worked for large stocks for a long time, if ever (at least if the value strategy is not applied within industries or sectors); (2) the explosion in share repurchase activity of firms has changed the nature of book equity, rendering B/P measures less useful; (3) the growing importance of intangibles and the failure of the accounting system to record such value on financial statements renders value measures anchored to current financial statements useless; (4) central bank interventions and the low-interest-rate environment over the last decade have distorted asset prices by lowering discount rates, negating the efficacy of value strategies; and (5) systematic value strategies are just too naïve to work because everyone knows about them. We address each of these criticisms in this article.

FRAMEWORK

Starting with the classic discounted dividend model and time invariant expected returns, we can express stock price, *P*, as follows:

$$P_{i,t} = \sum_{\tau=1}^{\infty} \frac{E[D_{i,t+\tau}]}{[1+r]^{\tau}}$$

E[] is the expectations operator, *D* is net dividends (the sum of dividends and repurchases, net of equity financing), and *r* is the expected return. Using the clean surplus relation, $B_{i,t} = B_{i,t-1} + X_{i,t} - D_{i,t}$, it is possible to derive an equivalent residual income valuation expression. *B* is the book value of common equity, *X* is comprehensive income, and *D* is net dividends. The residual income valuation expression is

$$P_{i,t} = B_{i,t} + \sum_{\tau=1}^{\infty} \frac{E[X_{i,t+\tau} - rB_{i,t+\tau-1}]}{[1+r]^{\tau}}$$

Although equivalent to the discounted divided model, this alternative valuation expression has the benefit of focusing on the value creation side of the financial statements. We can think of *B* as an approximation of invested capital and *X* as the return from the use of that invested capital. Stock prices increase not with simple earnings but when earnings exceed the required rate of return.

As with all valuation approaches, an investor needs to operationalize the aforementioned expressions with actual data for a firm. The infinity in the summation is the first stumbling block. It is challenging enough to forecast the next five years, let alone the next 50. But this forecasting challenge is also an opportunity for a disciplined value investor. We deliberately limit our forecasting horizon to only the immediate future, say the next two fiscal years, and effectively assume further speculation is fruitless. This truncates the forecasting exercise into (1) current observables, such as *B*; (2) near-term forecasts of residual income, $X_{i,t+1} - rB_{i,t}$; and (3) longer term (speculative) forecasts of future residual income and associated growth. Consistent with Penman (2010), this can be written as

$$P_{i,t} = B_{i,t} + \frac{E[X_{i,t+1} - rB_{i,t}]}{1+r} + \frac{E[X_{i,t+2} - rB_{i,t+1}]}{[1+r]r} + Speculation$$

In this way, we have focused the equity valuation on near-term observables from the balance sheet (*B* as an indicator for invested capital) and value creation from near-term earnings, *X*. The first term is known because it is observable from the current balance sheet. The next two terms require near-term forecasts of earnings, *X*, and a view on the required rate of return, *r*. The second term is discounted back one year, and the third term is also discounted back one year but in perpetuity. This capitalization factor is not of the standard $r - g$ Gordon constant-growth model variety. That choice is deliberate because, at least empirically, growth is very highly mean reverting, and we do not want our near-term forecasts corrupted by overly optimistic (or pessimistic) views of longer-term growth. An implication of this choice is that start-up, loss-making firms with negative retained earnings and little in the way of near-term earnings expectations will have all, or perhaps more than 100%, of their stock price explained by the speculative component.

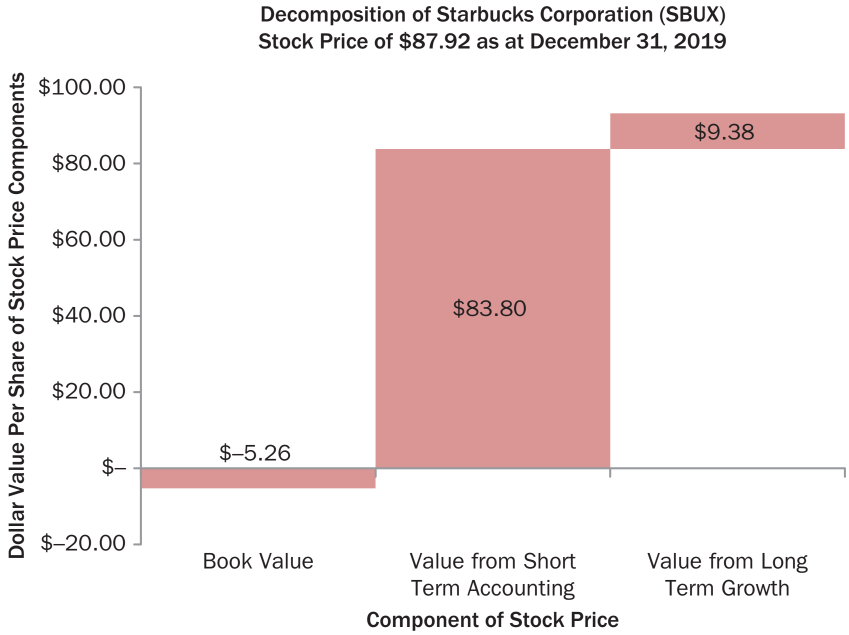
Of course, there is considerable measurement error in any equity valuation model. The accounting system that generates *B* and *X* is inherently subjective. That subjectivity may be abused by those individuals responsible for the preparation of financial statements. Furthermore, the forecasts for near-term earnings need to come from somewhere: Are sell-side equity analysts sufficiently informed and unbiased to provide meaningful forecasts? Digging a little deeper, what earnings number should be forecasted? Should it be comprehensive income to be consistent with the valuation theory, or should it be closer to core operating income, removing unusual items that are not likely to persist? A quandary indeed. Despite these issues, the framework forces an investor to focus on the near term, which is inherently easier to forecast than the intermediate/longer-term future.

The residual income valuation expression is a very convenient way to think about value investing. Combinations of *B* and *X* from the current financial statements and forecasted future financial statements are the anchor to which current price is evaluated. Ratios, such as B/P, E/P, and combinations thereof, naturally result from this approach. These ratios are simplifications of a full pro forma forecasting of future financial statements to arrive at a sequence of a future residual income values, but a benefit of this simplification is the humility with respect to longer-term forecasting. If the current price is largely composed of the final component, labelled *Speculation* in the preceding equation, we can think of that component of price as one that is especially risky (it is heavily dependent on longer-term forecasts being realized). One of the strongest patterns in economic markets is that of mean reversion (see, e.g., Fama and French 2000 and Nissim and Penman 2001), and that is particularly evident for the *Speculation* component of stock price.

It is perhaps easiest to see how this valuation framework operates with two concrete examples. We have selected Starbucks Corporation (SBUX) and Chipotle Mexican Grill (CMG) using data available as of December 31, 2019. These two companies both belong to Global Industry Classification Standard (GICS) industry 25301040 (Restaurants). SBUX is a larger company (market capitalization of $103.8 billion versus $23.3 billion, annual revenues of $26.5 billion versus $5.5 billion, and annual net income of $3.6 billion versus $387 million) and more geographically diversified (SBUX generates 73% of its sales from North America, and CMG is 100% from North America). We use stock price data from December 31, 2019, financial statement data from the most recent fiscal year end (September 30, 2019 for SBUX and December 31, 2018 for CMG), and sell-side forecasts of earnings and net dividends for the next two fiscal years. Both SBUX and CMG have actively repurchased common stock in recent years, particularly SBUX; as such, our forecasts of dividends need to be inclusive of all equity transactions. This makes the case studies of SBUX and CMG interesting because one of the critiques of B/P that we discuss later focuses on stock repurchase activity.

EXHIBIT 1

Starbucks Corporation (SBUX)



NOTES: This exhibit decomposes the stock price of SBUX of $87.92 on December 31, 2019 into three additive components based on a simple residual income valuation model. We use the following inputs for that decomposition: (1) current share price ($87.92), (2) assumed discount rate of 4.4% (based on US 10-year yield of 1.91%, rolling three-year beta of 0.82 for SBUX, and an assumed 3% equity risk premium), (3) current book value per share of –$5.26, (4) consensus earnings forecasts of $3.04 for fiscal 2020 and $3.42 for fiscal year 2021, and (5) consensus net dividend forecasts of $3.71 for fiscal year 2020 and $3.89 for fiscal year 2021. The decomposition is described in the text section labeled "Framework."

Exhibits 1 and 2 visualize the decomposition of stock price for SBUX and CMG into the three components (1) book value, *B*, (2) value from short-term accounting (next two years of residual income capitalized), and (3) the residual difference, labeled value from long-term growth or alternatively *Speculation*. It should be clear that the *Speculation* component of stock price is relatively more important for CMG than SBUX. The inference is simple: Relative to SBUX, CMG has a greater proportion of longer-term residual income and associated growth embedded in its stock price. Those longer-term growth expectations are prone to mean reversion, and it is stocks that exhibit this growth tendency that a value investor deliberately shuns (to avoid paying too much due to risk, erroneous expectations, or preferences). A value investor in this case would take a long position in SBUX and a short position in CMG. This value investor is looking to receive, or to be likely to receive, fundamental value sooner rather than later. This is a simple idea and one that has worked remarkably well across time periods, geographies, and asset classes (though not recently for equities).

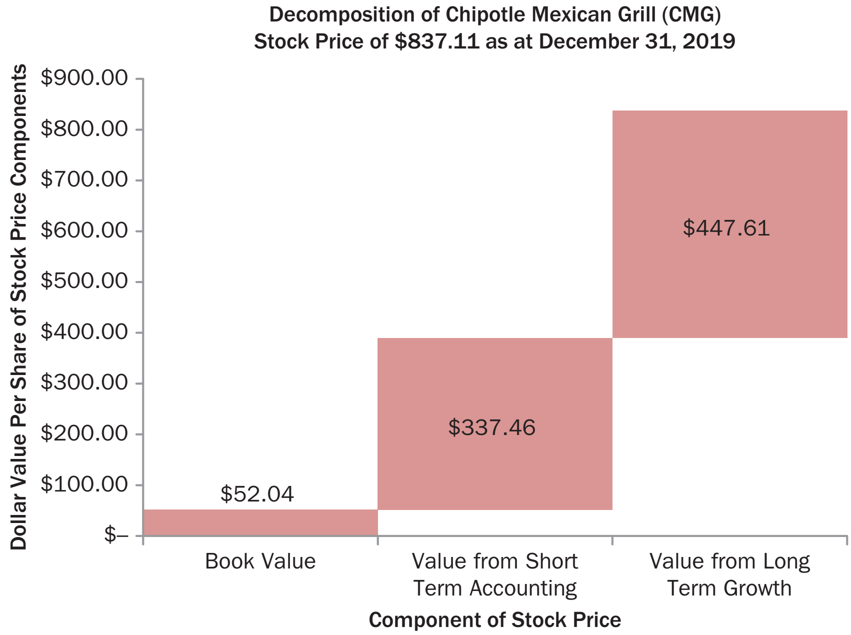
THE FACTS

The Data and the Measures

We begin with a brief description of the data and portfolio construction, leaving some of the details for the online appendix. We construct a sample that is focused on investable securities for which we have high-quality market data, especially with

EXHIBIT 2

Chipotle Mexican Grill (CMG)



NOTES: This exhibit decomposes the stock price of CMG of $837.11 on December 31, 2019 into three additive components based on a simple residual income valuation model. We use the following inputs for that decomposition: (1) current share price ($837.11), (2) assumed discount rate of 4.5% (based on US 10-year yield of 1.91%, rolling three-year beta of 0.85 for CMG, and an assumed 3% equity risk premium), (3) current book value per share of $52.04, (4) consensus earnings forecasts of $13.90 for fiscal year 2019 and $17.84 for fiscal year 2020, and (5) consensus net dividend forecasts of $6.87 for fiscal year 2019 and $8.12 for fiscal year 2020. The decomposition is described in the section labeled "Framework."

respect to liquidity. To be included, firms must have positive market capitalization and positive trading volume over the prior 180 trading days. We require a valid GICS industry classification to be included. Newly issued securities are excluded until at least one year after going public. We group firms into two size categories based on market capitalization. For large capitalization (LC), we keep approximately the largest 20% of securities based on market capitalization and the top 15% based on liquidity metrics. Our small capitalization (SC) universe for each country is then a subset of the remaining securities that still meet minimal liquidity requirements. The sample period begins between 1984 and 2002 depending on country (international data in the online appendix). As a consequence, the recent decade-long drawdown in value will be a significant portion of the sample. We use five separate measures for value: B/P, E/P, forward earnings-to-price (FEP), sales to enterprise value (S/EV), and cash flow to enterprise value (CF/EV). All value measures use the most recently available price information (see, e.g., Asness and Frazzini 2013).

To build portfolios, we group stocks into sectors (*peer groups*) within each country and subtract the median value score from each stock's value measure grouping. We then rank and standardize the de-meaned value measure across all stocks in each country. A full description of the data and portfolio construction can be found in the online appendix, in which we also document the efficacy of value investing over several country and market capitalization categories, as well as illustrating the benefit of certain portfolio design choices.

THE CRITICISMS

B/P Has Not Worked for Large Stocks

The poor performance for value strategies over the past decade has led some to revisit the original evidence in support of B/P. The original HML factor popularized by Fama and French (1993) is based on a comprehensive set of US-listed stocks covered by CRSP. This broad sample gives considerable weight to small and less liquid stocks that are of little relevance to large investors. Is it the case that B/P has any efficacy for large stocks? Israel and Moskowitz (2013) found that the value premium, as reflected by B/P, decreases with market capitalization and is weakest for the largest securities. Asness et al. (2015) made a similar point on the limited usefulness of HML across different time periods for US LC stocks. For an independent assessment of the performance of B/P in US LC, we can examine the common factor returns from a commercial provider of risk analytics. MSCI BARRA is one such provider of common factor risk models. For their USE3L (LC universe), they include two exposures related to value. First, they have a combined EARNYLD factor that includes measures of forecasted E/P, trailing E/P, and a longer-term average E/P. Second, they have a simple VALUE factor based on B/P. Returns for these factors are estimated from cross-sectional regressions, and they include a wide set of industry fixed effects, thereby controlling for a lot of across-industry variation. The common factor return for VALUE is very small relative to EARNYLD, and it has weak explanatory power for the cross section of US LC stocks. Specifically, over the period of January 1987 to August 2020, the EARNYLD (VALUE) factor return had an annualized Sharpe ratio of 0.86 (–0.05). Furthermore, the VALUE factor return has been in drawdown since February 2007, whereas the EARNYLD factor return has only been in drawdown since May 2015. Similarly, in a recent paper, Kessler, Scherer, and Harries (2020) found that across 3,168 alternative implementations of value strategies in the S&P 500 universe, B/P-based value strategies perform the worst.

The result that B/P works less well for larger firms is related to the fact that larger firms tend to be more mature in their life cycle, generating more stable earnings and cash flows. As such, a flow-based fundamental anchor such as current earnings or cash flows will be close to a sufficient statistic for expected returns. Penman et al. (2018) made this point explicitly. B/P is more important for stocks with higher expected earnings growth and for which that earnings growth is at risk. Indeed, Penman et al. showed that the original result of B/P squeezing out E/P in cross-sectional regressions of monthly stock returns onto firm characteristics only holds if the sample includes all stocks on CRSP. When limiting the sample to just the largest stocks and focusing on simple sort portfolios, B/P is not significant in the presence of E/P.

What does this mean for asset owners and asset managers interested in harvesting returns from value strategies? Focusing on just one fundamental anchor for intrinsic value is unlikely to be a successful strategy. Instead, ensure a multitude of fundamental measures are used to compare against price. Both historical and near-term forecasts of balance sheet items (e.g., book equity) and income statement or cash flow statement items (e.g., sales, earnings, or cash flows) may help improve measures of value. Any limitation in book equity (e.g., missing intangibles or stale assets that have not been written down) can be moderated by using multiple measures of value and by industry adjusting the respective value measure (e.g., Asness, Porter, and Stevens 2000). Even better, adjustments may be made to accounting attributes used as anchors in value measures, or those adjustments can be incorporated directly into the broader investment process. We will discuss some of these adjustments in the subsection labelled "Growing Importance of Intangible Assets." Simply noting that B/P does not work for US LC stocks does not negate the efficacy of value investing. You need to expand your horizons when it comes to measuring value. Book value is not the only fundamental anchor for price. Book value should form a part of any systematic valuation strategy. There is value in consistently applying a theoretically motivated valuation framework across countries.

A related, and important, point for systematic value strategies is how value measures interact with other well-known systematic sources of returns, especially momentum and quality. Much has been written about the negative correlation between value and momentum measures within (and across) asset classes, but particularly so for stocks (see, e.g., Asness, Moskowitz, and Pedersen 2013). Although our aim in this article is to focus on criticisms directly related to potential shortcomings in measures of value, such criticisms do not negate the diversification benefit of value exposures in the broader portfolio context. We can think of combining valuation measures with (1) price-based momentum measures, (2) fundamental-based momentum measures, and (3) broad-based measures of fundamental quality, as an improved valuation approach. Doing this effectively expands the set of information used, with a potential benefit being the mitigation of value traps. Asness et al. (2015) demonstrated that, even assuming zero expected returns from value, the negative correlation with momentum and quality would still lead to a nontrivial (about 15%) exposure to value.

Explosion in Share Repurchases

Much has been written about the growing dollar amount spent by companies in repurchasing their own stock. Although much of this hyperbole is overblown (see, e.g., Edmans 2017; Fried and Wang 2017; and Asness, Hazelkorn, and Richardson 2018), there is still an argument that repurchase activity reduces the usefulness of financial statement variables, in particular B, as a value anchor. The case of SBUX described earlier is a good example of this. In the fiscal year ended September 30, 2018 (2019), SBUX issued \$5.6 billion (\$1.6 billion) of long-term debt and repurchased about \$7.1 billion (\$10.2 billion) of common stock. This transaction effectively levered the balance sheet and reduced the book value of equity from \$5.5 billion as of September 30, 2017 to –\$6.2 billion as of September 30, 2019. Sell-side analysts are forecasting continued repurchase activity for SBUX (and other firms as well), such that book equity will fall even more and result in more firms with negative book equity in future fiscal periods. The increased use of stock repurchases coupled with declining and potential negative book values could in principle reduce the profitability of B/P strategies. However, as we discuss later, only a small fraction of firms have $B < 0$, so in practice it is not likely to have a material effect.

If many such firms engage in share repurchases, does it then follow that valuation frameworks are broken? No. From a theoretical perspective, transactions between the firm and the capital market (e.g., stock issuance, buybacks, dividends) are not value-creating activities and, as such, correctly bypass the income statement. These transactions do affect the balance sheet because cash, or some other asset, is typically used or given as consideration for these transactions. But this is not a problem per se. As a company engages in direct transactions with capital markets, changes will occur in (1) the size of the firm, (2) the leverage of the firm, and (3) expectations of how management will generate free cash flows going forward. All can affect expected returns. This does not, however, negate the usefulness of equity valuation approaches. Alternatively stated, is the suggestion to use something other than book or earnings to estimate intrinsic value? Classic accounting-based valuation models from Ohlson (1995) and Feltham and Ohlson (1995) link stock prices to linear combinations of book values and earnings (comprehensive income). Nowhere in those models is there a need to undo or adjust net dividends. In fact,

EXHIBIT 3

Value Portfolio Sharpe Ratios Linked to Share Repurchase Activity

	USA SC			USA LC		
	Zero	Low	High	Zero	Low	High
% of sample	57%	21%	21%	36%	32%	32%
MCAP Percentile	0.27	0.33	0.31	0.77	0.81	0.82
% B < 0	4.3%	2.1%	2.1%	2.5%	1.3%	2.1%
B/P	0.28	0.28	0.06	0.22	0.08	0.19
(t-stat)	*(1.7)*	*(1.7)*	*(0.3)*	*(1.3)*	*(0.5)*	*(1.2)*
E/P	0.39	0.15	0.23	0.20	0.06	0.34
(t-stat)	*(2.3)*	*(0.9)*	*(1.4)*	*(1.2)*	*(0.4)*	*(2.1)*
FEP	0.33	0.35	0.23	0.09	–0.01	0.30
(t-stat)	*(2.0)*	*(2.1)*	*(1.4)*	*(0.5)*	*(–0.1)*	*(1.8)*
S/EV	0.82	0.42	0.48	0.23	0.09	0.33
(t-stat)	*(5.0)*	*(2.5)*	*(2.9)*	*(1.4)*	*(0.5)*	*(2.0)*
CF/EV	0.70	0.57	0.57	0.48	0.44	0.73
(t-stat)	*(4.3)*	*(3.4)*	*(3.4)*	*(2.9)*	*(2.6)*	*(4.4)*
VAL	0.74	0.49	0.45	0.31	0.16	0.46
(t-stat)	*(4.4)*	*(3.0)*	*(2.7)*	*(1.9)*	*(0.9)*	*(2.8)*

NOTES: In this exhibit, we show the Sharpe ratio of five value portfolios (B/P, E/P, FEP, S/EV, and CF/EV as described in the text) and an equal risk-weighted combination (VAL) separately for our LC and SC universes, and for separate universes based on share repurchase intensity. This analysis is limited to the United States because this is where the vast majority of share repurchase activity occurs. US firms are split into three groups separately for LC and SC categories as follows: (1) firms with no share repurchase activity over the last 12 months, (2) firms with low levels of share repurchase activity over the last 12 months (defined as below the median of share repurchase activity over the last 12 months), and (3) firms with high levels of share repurchase activity over the last 12 months (defined as above the median of share repurchase activity over the last 12 months). Within each share repurchase partition, we adjust each value measure by subtracting the median of the respective sector (GICS level 2) group and then rank and standardize across all stocks belonging to that partition. Portfolio weights are directly proportional to the rank-standardized score. Portfolios are dollar neutral.

net dividends and no arbitrage pricing is the basis by which one can link stock prices to accounting fundamentals.

Exhibit 1 showing the decomposition of SBUX stock price makes this point clear. The book value of equity will become increasingly less important as share repurchases continue to reduce book equity (share repurchases are recorded as a contra-equity account in the statement of shareholders' equity), but near-term earnings (assuming the entity is still able to generate earnings on a reduced capital base) translate into higher near-term residual income forecasts. We need to remember that residual earnings are earnings above the required rate of return on invested capital, so as book values decline, holding all else equal, residual earnings will increase. As mentioned previously, no single financial statement attribute, such as *B*, is sufficient to capture value.

To assess whether share repurchase activity has lessened the usefulness of systematic value measures, we consider the performance of our five value measures conditional on the recent share repurchase activity. We examine US LC and US SC securities because share repurchases have been most common in the United States. In each size universe, we sort stocks based on the trailing 12-month share repurchases (as reported in the financing section of the statement of cash flows) divided by the average market capitalization over the past 12 months. Firms with no repurchase activity are grouped together (zero), and the remaining firms are split into two groups (low/high) based on the median level of repurchase intensity. If share repurchases affect the efficacy of value measures, particularly B/P, we expect to see value work less well in the high group and to work less well in more recent years as the intensity of repurchase activity has increased over time. Exhibit 3 reports the results.

Over our time period 57% (36%) of US SC (LC) stocks engaged in no share repurchase activity over the prior 12 months. Firms that engage in share repurchase activity tend to be slightly larger than firms that do not repurchase. The average market capitalization percentile of zero-repurchase firms is 0.27 (0.77) for SC (LC) firms, respectively, whereas repurchasing firms are at the 0.33 (0.81) market capitalization percentile in SC (LC), respectively. In unreported analyses, consistent with prior research (e.g., Fried and Wang 2017), we also find increasing levels of share repurchase activity over time. Over the last six years (2014–2020) some 60% (80%) of SC (LC) firms have engaged in share repurchase activity.

We also note the fraction of the sample in which $B < 0$. As discussed earlier, significant levels of share repurchase activity could lead to very low, and even negative, book values. Across the SC and LC share repurchase partitions, we see only a small fraction (around 2%) of firms having negative book values. This average does, however, mask a temporal trend. In unreported analysis, we note that for both SC and LC stocks the fraction of negative book values has increased to around 4% in more recent years and closer to 5% for the high share repurchase subsample in the LC universe.

Turning to the performance of value portfolios across share repurchase intensity partitions, we see only mixed evidence of value working less well for the high share repurchase subsample. For B/P, there is some evidence of lower returns for the high group relative to the zero or low group in the SC universe but not in the LC universe. Across other value measures, and the value-combined portfolio, the evidence is muted. In unreported tests, we can reject the null hypothesis of equal average returns across pairs (e.g., high versus zero, low versus zero, and high versus low) for only two out of the possible 36 combinations (six measures, two size universes, three repurchase partitions), and that difference was for S/EV in SC.

To help assess whether there is any temporal variation in the impact that share repurchase activity may have on the performance of systematic B/P portfolios, in Exhibit 4 we report rolling two-year Sharpe ratios for B/P portfolios for the zero, low, and high share repurchase subgroups. Panel A (Panel B) reports results for the LC (SC) universe. For both SC and LC, there is no systematic evidence that B/P performs worse for firms that repurchase the most. Even though share repurchase intensity has increased over our sample period, it is not the case that B/P has performed worse more recently for share repurchase intensive firms.

Growing Importance of Intangible Assets

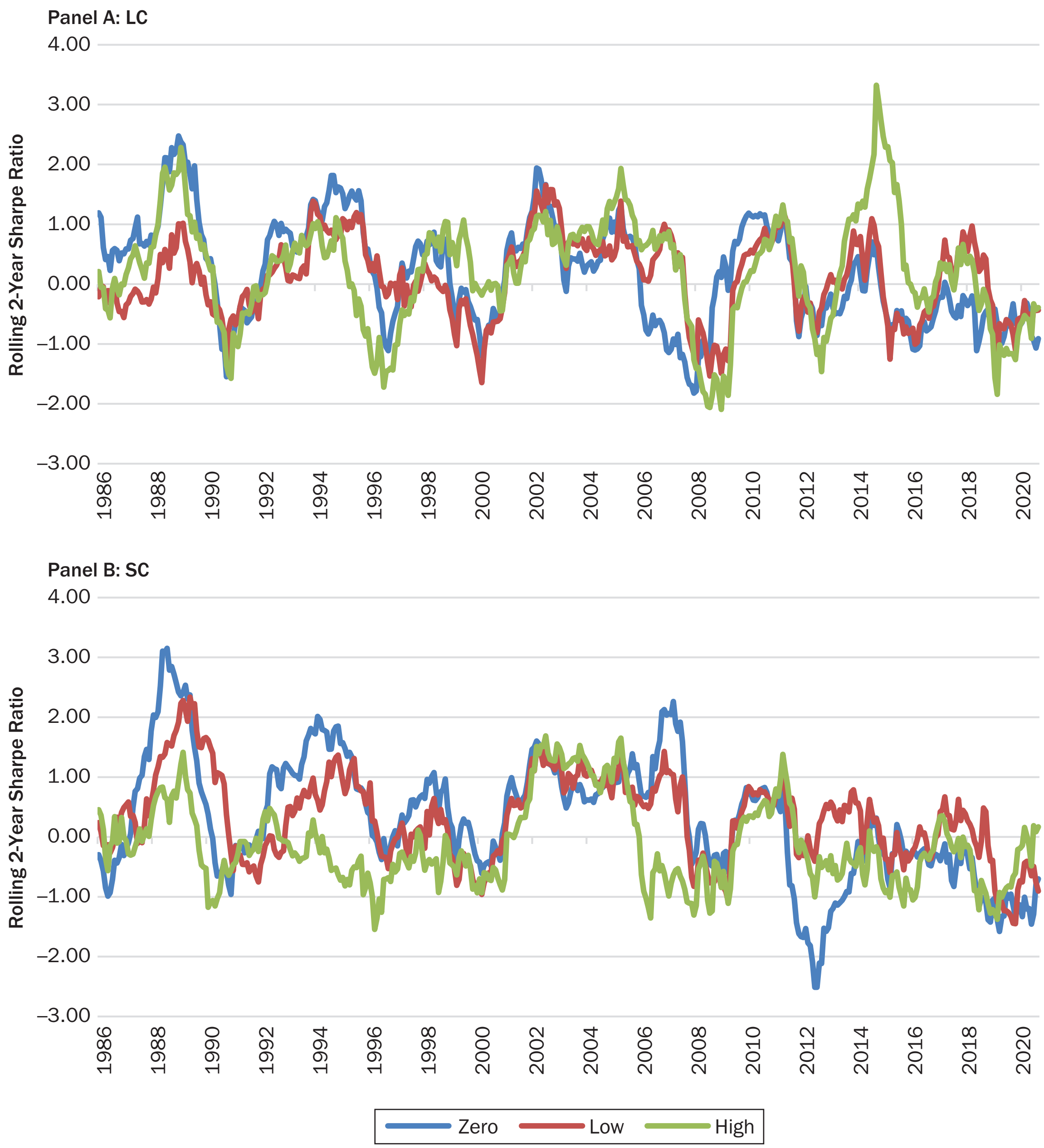
A limitation of all valuation approaches is the quality of the data inputs. For the equity valuation framework outlined previously, this means that the quality of the financial statements needs to be sufficiently precise. How is this possible? The financial reporting system is based on a vast set of—ultimately subjective—accounting standards and accounting practices that have evolved over time to record an increasingly complex set of transactions. The output of this reporting system is the set of primary financial statements (income statement, balance sheet, and statement of cash flows) that is at the heart of any value investor's toolkit. With the advent of modern technology, are accounting statements still fit for purpose? Some (e.g., Lev 2017) argue strongly that financial reporting information is no longer relevant, in part due to setters of accounting standards walking away from the traditional matching implicit in income recognition and in part due to the accounting system failing to recognize increasingly important intangible assets.

There is, however, nothing new in this critique of the financial reporting system. Similar criticisms were raised back in the 1970s when research and development expenditures were mandated to be expensed (see, e.g., Dukes, Dyckman, and Elliott 1980; Lev and Sougiannis 1996). Likewise, in the late 1990s, much was said about the lack of "eyeball" metrics embedded in financial statements, as if such measures could be indicative of value creation. We all know how that ended. Although we can all argue that the accounting system may miss capitalizing certain aspects of value-creating activity, such as research and development (R&D) and advertising, we also know the rules that govern the accounting system. We are all free to make adjustments to undo any perceived imperfection in the accounting system.

A classic criticism of B/P type metrics is that *B* is stale (e.g., Kok, Ribando, and Sloan 2017). A firm may appear to be cheap (as indicated by a high B/P ratio), but that is simply because *B* has not yet been written down, and the stock price already reflects that write-down. Indeed, Kok, Ribando, and Sloan (2017) suggested that book values tend to mean revert to prices instead of prices mean reverting to book values. However, the inference here is not that systematic approaches to valuation are invalid; it is that attention needs to be paid to details. We will revisit this point of differential

EXHIBIT 4

Two-Year Rolling Sharpe Ratios for the B/P Value Strategy for the US



NOTES: This exhibit shows the two-year rolling Sharpe ratios for the B/P value strategy for the US across three subsamples based on share repurchase intensity. US firms are split into three groups separately for LC and SC categories as follows: (1) firms with no share repurchase activity over the last 12 months (labeled Zero), (2) firms with low levels of share repurchase activity over the last 12 months, defined as below the median of share repurchase activity over the last 12 months (labeled Low), and (3) firms with high levels of share repurchase activity over the last 12 months, defined as above the median of share repurchase activity over the last 12 months (labeled as High). Within each share repurchase partition, we adjust B/P by subtracting the median of the respective sector (GICS level 2) group and then rank and standardize across all stocks belonging to that partition. Portfolio weights are directly proportional to the rank-standardized B/P score. Portfolios are dollar neutral.

mean reversion of components of value strategies in a later subsection titled "Do Fundamentals Still Matter for Stock Returns?"

If the source of measurement error in an accounting attribute is due to an accounting standard systematically missing an asset (e.g., R&D), then comparing similar firms within an industry that is R&D intensive, as opposed to comparing an R&D-intensive firm with a retail firm, will help mitigate this (see, e.g., Asness, Porter, and Stevens 2000). An alternative approach may be to construct firm-specific capitalization schedules to bring onto the balance sheet any excluded economic asset (e.g., Lev and Sougiannis 1996). More recently, Lev and Srivastava (2020) suggested that (1) capitalizing R&D expenditures and selling, general, and administrative expenses and (ii) amortizing this asset over industry-specific schedules will yield adjusted, and possibly improved, measures of book equity and earnings. Their empirical analysis suggests an improvement for value strategies using such adjustments.

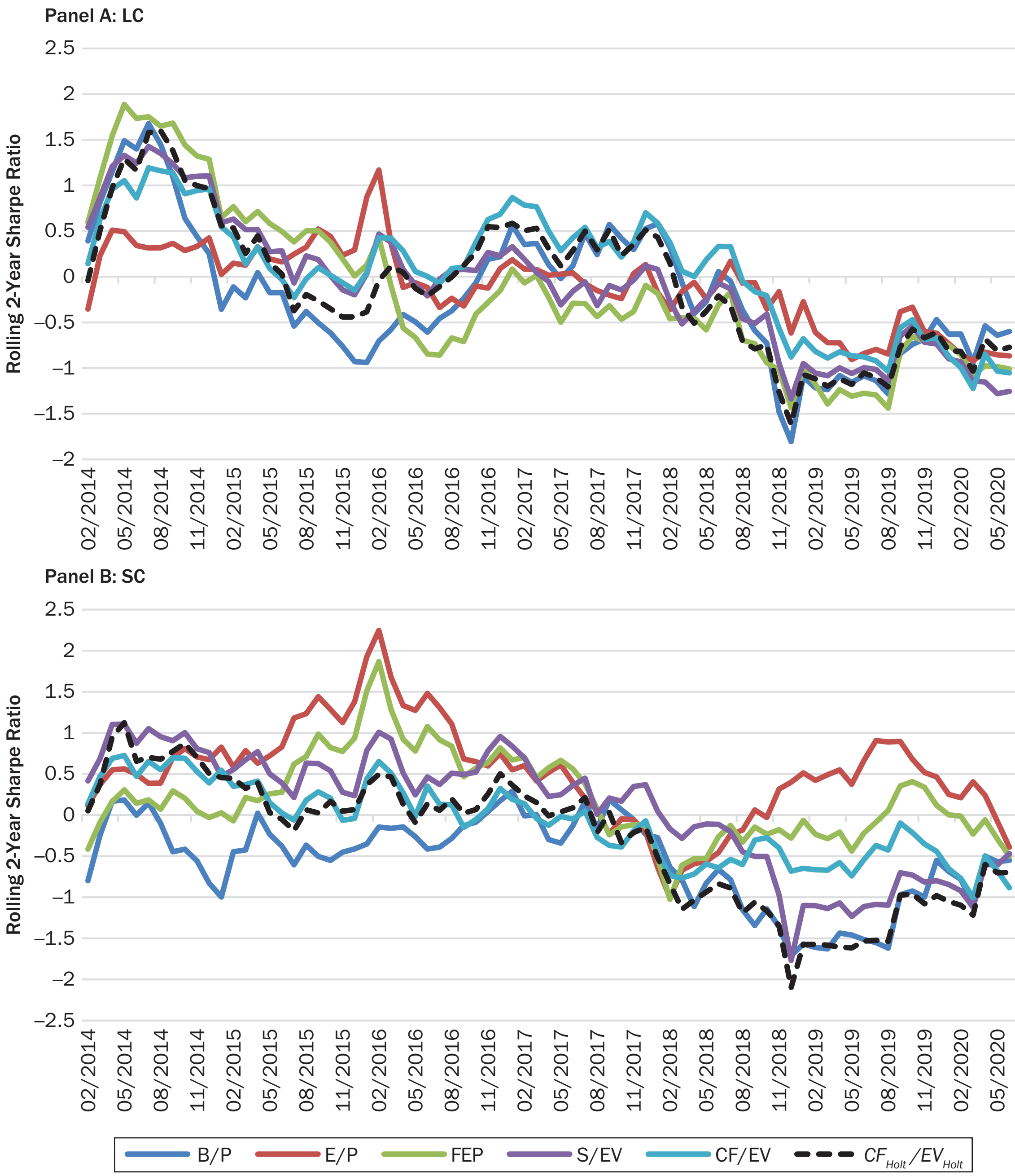
There are now data vendors attempting to correct for multiple limitations embedded in the financial reporting system (e.g., Credit Suisse HOLT and New Constructs). These changes are far from simple, though, because significant choices must be made to reconstruct financial statements and ensure that they continue to articulate correctly. HOLT (Credit Suisse) and New Constructs typically recompute earnings and cash flow metrics by adjusting reported financial statement data (1) to undo some of the conservative choices embedded in the financial reporting system (e.g., capitalize research and development expenditures and adverting expenditures instead of immediately expensing them) in the case of HOLT and (2) to attempt to exclude nonrecurring, and hence less value relevant, components of income in the case of New Constructs. These adjusted earnings and cash flow numbers could then be used as alternative fundamental anchors to price, or these adjusted earnings numbers could be compared to reported earnings numbers and the difference could become another attribute to seek exposure to in a portfolio (see, e.g., Penman and Zhang 2002). These adjustments for hidden assets are most relevant for firms experiencing significant growth or contraction in their investment activity (e.g., increasing levels of R&D or advertising expenditure), which is less likely for mature LC firms.

To help document whether there is any support for the criticism that accounting-fundamental-based measures of value have become less useful, we can assess the performance of valuation metrics using adjusted operating cash flows (where the adjustments are designed to undo various limitations in the financial reporting system). For this purpose, we use data from Credit Suisse HOLT. Specifically, HOLT constructs an inflation-adjusted gross cash flow, which is computed as net income adjusted for special items, depreciation and amortization, interest expense, rental expense, minority interest, and various other proprietary economic adjustments (CF_{HOLT}). To convert this to a valuation multiple, we scale it by enterprise value as estimated by HOLT (EV_{HOLT}). Enterprise value is estimated as the sum of equity market capitalization, minority interest, and debt. The ratio CF_{HOLT}/EV_{HOLT} is then directly comparable to the CF/EV multiple we examined earlier in this article.

Under the reasonable assumption that the changes Credit Suisse HOLT makes to financial statements is in the direction of improving the usefulness of accounting information for valuation purposes, what improvement does it generate? A natural comparison is to CF/EV, and we can see similar performance. Exhibit 5 reports rolling two-year Sharpe ratios across all six value measures (B/P, E/P, FEP, CF/EV, S/EV, and CF_{HOLT}/EV_{HOLT}). For brevity, we do this just for US LC (Panel A) and US SC (Panel B), and we focus on the most recent period because this is where value underperformance has been most striking and the recent claims about the rise of intangible assets have been strongest. There is considerable similarity in the performance of value measures over the last five years (especially for US LC, where there is notable decline in the

EXHIBIT 5

Two-Year Rolling Sharpe Ratios for the Individual Value Strategies



NOTES: This exhibit shows the two-year rolling Sharpe ratios for the individual value strategies (B/P, E/P, FEP, S/EV, and CF/EV as described in the text) within the LC and SC universe for US stocks. We introduce a sixth value measure, CF_{HOLT}/EV_{HOLT}, which uses an adjusted measure of operating cash flow and an adjusted measure of enterprise value. The adjustments are made by Credit Suisse-HOLT. For all six value metrics, we first adjust the valuation ratio by subtracting the median of the respective sector (GICS level 2) group in LC and SC separately. We then rank and standardize within SC and LC separately. Portfolios are formed with portfolio weights directly proportional to the rank-standardized score. Portfolios are dollar neutral.

performance of value strategies across the board).[1] A key inference to be drawn here is that the recent underperformance of value strategies extends to value measures that attempt to correct for deficiencies in the financial reporting system. The growing importance of intangibles or changes in business models appears unlikely to explain the recent underperformance of value strategies. Indeed, as we will see later, even with the benefit of perfect foresight with respect to future earnings and cash flows (over the next year) value strategies would still have faced headwinds.

Central Bank Interventions/Interest Rate Environment

A more recent, and casually appealing, explanation for the underperformance of value strategies generally over the last decade is the interest rate environment, attributable, in part, to the concerted effort of central banks globally to keep interest rates low. The typical arguments proceed as follows. First, equity valuation frameworks (as outlined previously) all equate price with discounted free cash flows (or dividends, or residual income). Second, value (growth) stocks seem to be those with less (more) in the speculative component outlined earlier. So far nothing appears unreasonable. Third, leaning on the intuition of the duration concept from fixed income, the claim is then that value (growth) stocks are effectively short (long) duration assets, and as such their relative prices will move inversely with movements in interest rates. Now, however, the arguments are either unreasonable or tenuous at best.

First, which interest rate are we talking about? In any equity valuation model, the discount rate will comprise a risk-free rate and a risky component. Both components have a term structure to them. So, are we talking about how the value strategy performs when (1) short-term risk-free rates (e.g., three-month T-bills) are high or low, or (2) longer-term risk-free rates (e.g., 10-year rates) are high or low, or (3) the slope of the risk-free curve is high or low? Furthermore, is it the level of these rates or is it the change in rates (either the level or shape of the risk-free curve) that matters? Presumably, it should be changes in rates that are associated with changes in equity prices and not the level per se.

Second, does the duration concept carry over to stocks? This is far from clear because, unlike bonds, the cash flows associated with equity claims are not fixed. Thus, any change in discount rates (risk-free or risky component) will affect expectations of free cash flows. Those effects are difficult to prespecify. For example, short-term risk-free rates are largely set by central bank policy, and those rates are determined via models designed to respond to prevailing macroeconomic conditions. Short-term rates tend to be lowered (raised) in periods of contraction (expansion). Expectations of free cash flows are also likely to be lower (higher) in these periods (see also the discussion by Asness 2003 linking expected earnings growth rates to expected inflation changes and yields). The overall effect on stock prices is not clear because both the numerator and denominator move in the same direction. The situation is further complicated if one considers the risk premium embedded in discount rates that are also time varying and related to the same macroeconomic conditions affecting central bank policy and free cash expectations. Yes, this can get confusing quickly. Our aim here is simply to note that a partial derivative applied to an equity valuation formula can be intuitively appealing to describe value (growth) stocks as low (high) duration, and as such, their values should move in lock-step with interest rate changes. However, that partial derivative is holding many other things constant

[1] In unreported analysis, we also tried an adjusted BP measure, comparable to the adjustments made by Lev and Srivistava (2020), Peters and Taylor (2017), and Amenc, Goltz and Luyten (2020), and found similar underperformance in the recent period.

(an assumption that is probably false or at the very least a special case that is unlikely to have existed over the time period).

For those interested in a more complete examination of the theoretical and empirical links between interest rates and the performance of value strategies, we refer the reader to Maloney and Moskowitz (2020). Long–short, industry-neutral value portfolios exhibit little sensitivity to the level of interest rates (either the level of three-month rates or 10-year yields or the slope between them). There is, however, some evidence that the performance of value strategies is positively related to changes in the slope of the yield curve for both US and international stocks (i.e., value stocks do poorly when the yield curve flattens). Although there is a statistical contemporaneous relation between the performance of value strategies and changes in the slope of the yield curve, this relation is weak and explains only a very modest portion of returns (R^2 in the low single digits). Extending this contemporaneous relation to predictive regressions generates even lower explanatory power (i.e., an investor would need to accurately forecast changes in the shape of the yield curve to exploit that small contemporaneous return pattern). And would it not make sense to trade bonds directly if one had the skill to forecast changes in the shape of the yield curve? What looks like an appealing causal explanation for the troubles of value over the last decade (i.e., low rates benefitting assets with longer-dated claims) is only minimally supported by the data and then only contemporaneously and not predictively.

Systematic Value Strategies Are Too Well Known

A classic criticism of systematic approaches to value investing is that it seems implausible that investing in simple and well-known strategies, such as B/P or E/P, can systematically identify mispriced securities (e.g., Sloan 2019). This criticism could be applied to most systematic investing approaches. Of course, this too-well-known criticism seems to get far more airtime after periods of poor performance of a given systematic strategy. Asness (2015) discussed this point explicitly and noted that simple awareness of a measure, such as B/P, itself does not negate the effectiveness of that measure as a potential source of expected returns. Investors need to know about it and be comfortable in allocating capital to such a strategy.

Extensive research has shown that value strategies (e.g., B/P) behave like a risk premium (e.g., distress risk from Fama and French 1992; risk of assets in place from Berk, Green, and Naik 1999 and Zhang 2005; investment-related risks from Cooper, Gulen, and Schill 2008 and Gomes, Kogan, and Zhang 2003; and q-theory from Cochrane 1991, 1996). We agree that it is always reasonable and rational to continue to ask whether a given characteristic is likely to be associated with future returns, but it is also useful to remind ourselves why we hold that prior belief. Systematic value measures, such as B/P and E/P, are indicators of expected returns for several reasons. First, part of the expectation is attributable to hard-to-diversify sources of risk that an investor is compensated for holding. Second, part of the return can be attributable to errors in investor expectations. Awareness and increased participation on the other side of the trade (i.e., more marginal buying of systematically cheap securities) may reduce the return benefit coming from errors in expectations, but it does not follow that a risk premium will disappear just because investors know how to compute ratios for firms (that awareness arguably existed 40 years ago too). Extending this logic, it is also useful to remember that awareness and increased participation do not lead to losses; rather, they could be associated with lower future risk-adjusted returns. Risk-based explanations, however, explicitly allow for negative return realization, so it is difficult to reconcile large drawdowns with awareness/crowding concerns.

Although it is hard to assess who is actually on the other side of a value strategy, if it were the case that everyone was aware and substantial capital had been deployed, a natural outcome would be a significant compression in value spreads. That is, cheaper stocks would appear less cheap today relative to more expensive stocks. Alas, although there is variation in value spreads through time, and that variation aligns with variation in the performance of value returns, making predictive statements is challenging (see, e.g., Asness et al. 2000 and Fama and French 2020). If anything, value spreads have widened in recent years, making crowding an unlikely explanation for the recent drawdown. Relatedly, the fact that a strategy has not worked recently is also typically insufficient to state it will not work tomorrow. Substantial evidence across time periods, geographies, and asset classes should require more counterfactual evidence before we throw in the towel. A good example of this is given by Green, Hand, and Soliman (2011), who claimed that the accrual anomaly disappeared as investor awareness increased in the 2000s. It is interesting to note that accrual type measures worked reasonably well in the 2010s. Awareness combined with capital allocations may well reduce the magnitude of future expected returns for a given systematic strategy, but asserting that it goes all the way to zero runs the risk of missing useful strategies that have experienced a tough period. Indeed, for prominent factors (e.g., value) the evidence supports out-of-sample (i.e., post publication) evidence in many asset classes and geographies (see, e.g., Table 3 from Ilmanen et al. 2019).

A related critique, implicit in our article's title, is that systematic valuation approaches are naive in that they ignore anything beyond the near term when estimating intrinsic value. We noted earlier that this was/is a deliberate choice designed to avoid the strong mean-reverting tendency implicit in longer-term earnings growth expectations. Prior research has focused on the mean reversion in earnings growth (Nissim and Penman 2001), the overextrapolation of past growth (Lakonishok, Shleifer, and Vishny 1994), and the overreliance on future expected growth (Dechow and Sloan 1997) as a basis for the efficacy of value strategies. In the next section, we will see how valuation multiples do indeed revert consistent with mean reversion in the speculative component of stock prices. Although this mean reversion happens on average, it is not always the case, particularly in periods in which stock prices respond less to fundamental news.

Do Fundamentals Still Matter for Stock Returns?

Value strategies have worked well across multiple asset classes, time periods, and geographies. However, for stocks, the last decade has been tough, with value strategies facing significant headwinds especially in the last few years. We have assessed a variety of reasons for the recent underperformance. It is not just B/P that has not worked for LC stocks. Yes, B/P has weak evidence for the US LC universe, but B/P is but one of many value measures, and the recent underperformance is not unique to LC stocks or B/P. It is not due to increased share repurchase activity. Yes, share repurchases mechanically reduce B, but we still found evidence that B/P is associated with future returns within stocks with high levels of share repurchase activity, and there was little relation between share repurchase intensity and the performance of other value measures. The vagaries of the accounting system that generates the various fundamental anchors does not seem a likely culprit. Business models are changing (they always do), and the unconditionally conservative nature of the accounting system means that internally generated intangible assets remain off the balance sheet; however, we found that measures designed to purge these distortions have also underperformed recently. In the online appendix, we show that industry-adjusting the value measures (which captures a large amount of the impact of unconditionally conservative accounting rules) improves the performance of value measures generally, so there can be some merit to the rise of intangibles criticism. It is, however, an incomplete explanation at best and not unique to the recent period. The claim that interest rates (and their path to lower levels) explain the underperformance of value strategies was found wanting from both first principles and the data. We also discussed the potential impact of awareness and how that may explain the temporal decline in the performance of value strategies, but that explanation is difficult to reconcile with the data.

So, what could explain the underperformance of value strategies? Value strategies work when fundamental value and price converge. For a value investor, this primarily comes from prices reverting to fundamentals. Value could also work by buying cheap cash flows with prices remaining unchanged (but we will see in the following that this is not typical). If fundamentals converge to price, or the wedge between price and fundamentals continues to grow, value strategies will not work. This can happen when stock prices respond less to fundamental (cash flow) news. One simple way to assess whether fundamentals help a value investor is to cheat and use future earnings expectations. We do this for our sample of US LC and US SC securities. We create a perfect foresight strategy labeled FEP*. This is analogous to the FEP portfolio considered previously, but we now use the one-year-ahead earnings forecast that is released one year from now. For example, forming a portfolio in December 2018, the FEP measure uses analyst forecasts of earnings for calendar year 2019 that are released as of December 2018. The FEP* measure uses analyst forecasts of earnings for calendar year 2020 that are released as of December 2019. This is cheating, but our aim is to use this cheating portfolio to think about the importance of fundamentals (i.e., earnings expectations) in explaining stock returns. Unsurprisingly, Panel A of Exhibit 6 shows very high Sharpe ratios, but what is interesting is the precipitous drop in performance around the end of the dot-com era and a drop in recent years as well. Panel B of Exhibit 6 reports the cumulative returns to the FEP and FEP* strategies for US SC and US LC separately. Note that we use separate axes for FEP* and FEP cumulative returns. Clearly, cheating would be a great strategy, but its efficacy has waned in certain periods (the dot-com era and most recently). There is a suggestion here that fundamentals are now less relevant for stock prices.

To more formally assess the relevance of fundamental information for stock prices, we conduct a variance decomposition of stock returns for our US sample (combining the SC and LC universes together). We focus on the US sample because this is where the data coverage is best for our return decomposition method, and this is where value performance has suffered the most.

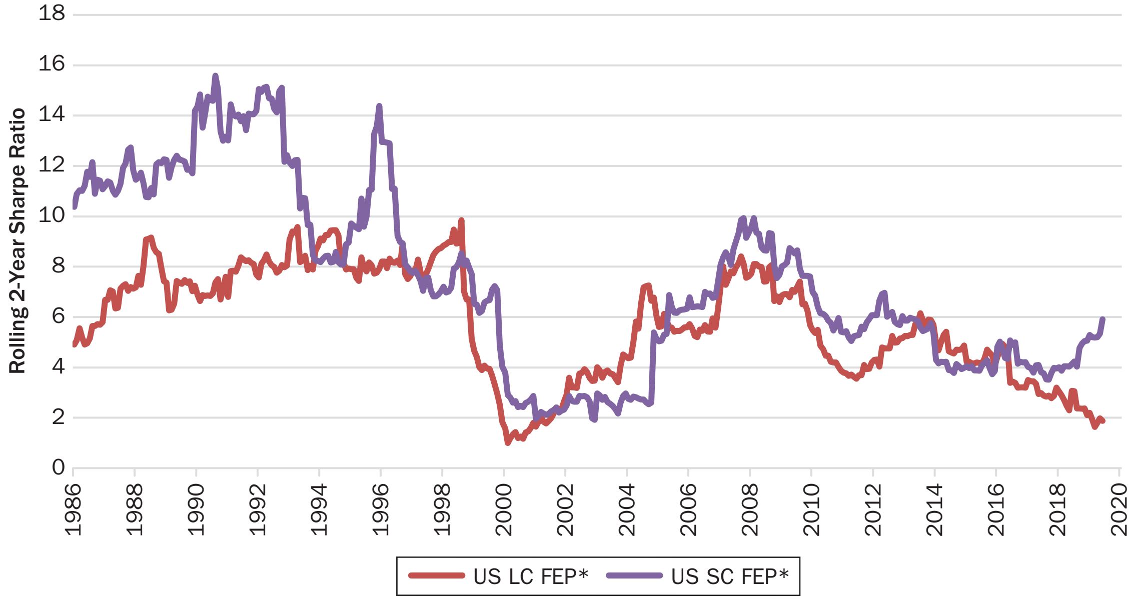
We conduct our return variance decomposition in log space, defining log returns as $\ln(R_t) = \ln\left(\frac{P_t + D_t}{P_{t-1}}\right)$. Using our earlier residual income motivated expression for price and suppressing firm subscripts, we define fundamental value as $F_t = B_t + \frac{E[X_{t+12} - rB_t]}{1+r} + \frac{E[X_{t+24} - rB_{t+12}]}{[1+r]r}$, where B is the current book value of equity. Earnings expectations are based on consensus forecasts for the next two years (X_{t+12} and X_{t+24} correspond to 12- and 24-month-ahead earnings forecasts, respectively). Log returns can then be additively decomposed into three components as follows: $\ln(R_t) = \ln\left(1 + \frac{D_t}{P_t}\right) + \ln\left(\frac{P_t / F_t}{P_{t-1} / F_{t-1}}\right) + \ln\left(\frac{F_t}{F_{t-1}}\right)$. For brevity, we refer to the three components as (1) DIV (gross dividend return), (2) ΔMULT (multiple expansion), and (3) ΔFUND (fundamental news). This framework is like the approach used by Richardson, Sloan, and You (2012) with the primary differences being our use of log returns and a complete measure of fundamental news. We have repeated our analysis using the same method in Richardson, Sloan, and You (2012) and find similar results. We prefer our method because it preserves a completely additive decomposition of log returns.

To start, we run monthly cross-sectional regressions of 12-month-ahead log returns, $\ln(R_{t,t+12})$, onto $\ln\left(\frac{F_t}{P_t}\right)$ and $\ln\left(\frac{F_{t+12}}{F_t}\right)$. Our two explanatory variables are broad

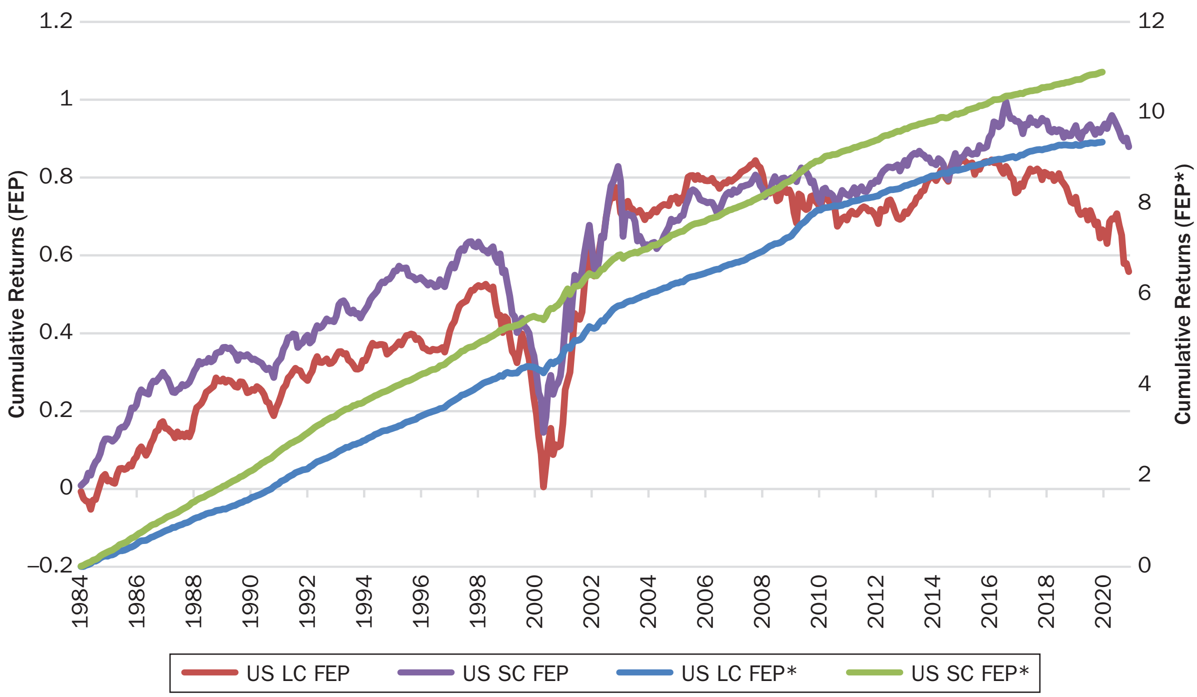
EXHIBIT 6

Performance of Perfect Foresight Earnings-Based Value Strategies

Panel A: Rolling Two-Year Sharpe Ratio



Panel B: Cumulative Returns



NOTES: This exhibit reports the performance of perfect foresight earnings-based value strategies. Panel A reports rolling two-year Sharpe ratios. Panel B reports cumulative returns. Our perfect foresight strategy, FEP*, uses the 12-month earnings expectations from sell-side analysts one year forward. For example, a portfolio constructed as of December 31, 2018 would use analyst forecasts for the 2020 calendar year that were released in December 2019. For comparative purposes, we also report cumulative returns for FEP in Panel B. The FEP* portfolio is constructed by grouping stocks into sectors (peer groups) and subtracting the median FEP* score from each stock's grouping. We then rank and standardize the de-meaned measure.

EXHIBIT 7

Importance of Fundamentals

Year	$\ln\left(\frac{F_t}{P_t}\right)$	*t*-stat	$\ln\left(\frac{F_{t+12}}{F_t}\right)$	*t*-stat	R^2
1987	0.16	*5.0*	0.49	*13.3*	0.28
1988	0.23	*8.2*	0.47	*14.0*	0.30
1989	0.16	*6.1*	0.47	*14.4*	0.28
1990	0.12	*4.0*	0.63	*17.2*	0.34
1991	0.19	*7.1*	0.61	*17.0*	0.37
1992	0.29	*11.9*	0.64	*18.6*	0.40
1993	0.31	*12.8*	0.66	*20.4*	0.42
1994	0.18	*8.7*	0.52	*18.1*	0.30
1995	0.16	*6.8*	0.54	*17.2*	0.30
1996	0.20	*8.4*	0.58	*18.5*	0.34
1997	0.34	*17.3*	0.64	*21.0*	0.43
1998	0.19	*7.3*	0.64	*18.5*	0.35
1999	**0.03**	***1.2***	**0.60**	***15.2***	**0.25**
2000	**–0.02**	***–0.3***	**0.65**	***15.0***	**0.28**
2001	0.44	*22.3*	0.55	*16.3*	0.50
2002	0.31	*16.6*	0.47	*16.7*	0.37
2003	0.10	*6.0*	0.41	*15.9*	0.27
2004	0.21	*14.3*	0.44	*17.5*	0.33
2005	0.19	*13.6*	0.48	*22.2*	0.39
2006	0.10	*6.5*	0.43	*19.2*	0.30
2007	0.08	*4.9*	0.46	*16.7*	0.28
2008	0.12	*4.6*	0.60	*17.8*	0.34
2009	0.11	*4.6*	0.42	*17.1*	0.26
2010	0.15	*6.9*	0.33	*13.0*	0.20
2011	0.10	*5.8*	0.41	*15.8*	0.25
2012	0.11	*5.9*	0.46	*15.0*	0.27
2013	0.11	*6.7*	0.40	*13.6*	0.26
2014	0.10	*7.2*	0.38	*14.7*	0.25
2015	0.09	*5.5*	0.45	*17.3*	0.34
2016	0.06	*4.3*	0.36	*12.8*	0.22
2017	0.12	*8.6*	0.42	*14.2*	0.26
2018	**0.03**	***1.9***	**0.37**	***12.9***	**0.21**
2019	**0.02**	***0.9***	**0.45**	***12.0***	**0.20**
2020	**–0.07**	***–4.2***	**0.47**	***15.1***	**0.28**

NOTES: In this exhibit, we report averages of monthly cross-sectional regressions of future 12-month-ahead log returns, $\ln(R_{t,t+12}) = \ln\left(\frac{P_{t+12}+D_{t+12}}{P_t}\right)$, onto two broad fundamental-based measures. First, we include a lagged valuation multiple, $\ln\left(\frac{F_t}{P_t}\right)$, where $F_t = B_t + \frac{E[X_{t+12}-rB_t]}{1+r} + \frac{E[X_{t+24}-rB_{t+12}]}{[1+r]r}$. This broad value measure is designed to capture expectations of near-term fundamental value. B is the current book value of equity. Earnings expectations are based on consensus forecasts for the next two years (X_{t+12} and X_{t+24} correspond to 12- and 24-month-ahead earnings forecasts, respectively). A firm-specific discount rate, r, is used based on prevailing risk-free rates, a firm-specific beta, and an assumed 3% equity risk premium. Second, we include a measure of fundamental growth computed as $\ln\left(\frac{F_{t+12}}{F_t}\right)$. To keep this fundamental growth measure free of changing expectations of discount rates, we hold r fixed for the growth period. The regression is run every month, and we average regression coefficients across months in each calendar year.

fundamental-based measures. The first term, $\ln\left(\frac{F_t}{P_t}\right)$, is a fundamental-based measure of expected returns, and the second measure, $\ln\left(\frac{F_{t+12}}{F_t}\right)$, captures changes in expectations of near-term fundamental value over the return cumulation period. Our firm-specific discount rate, r, uses prevailing risk-free rates, a firm-specific beta, and an assumed 3% equity risk premium. To keep our fundamental growth measure free of changing discount rate expectations, we hold r fixed for the growth period. The regression is run every month, and we average regression coefficients across months in each calendar year.

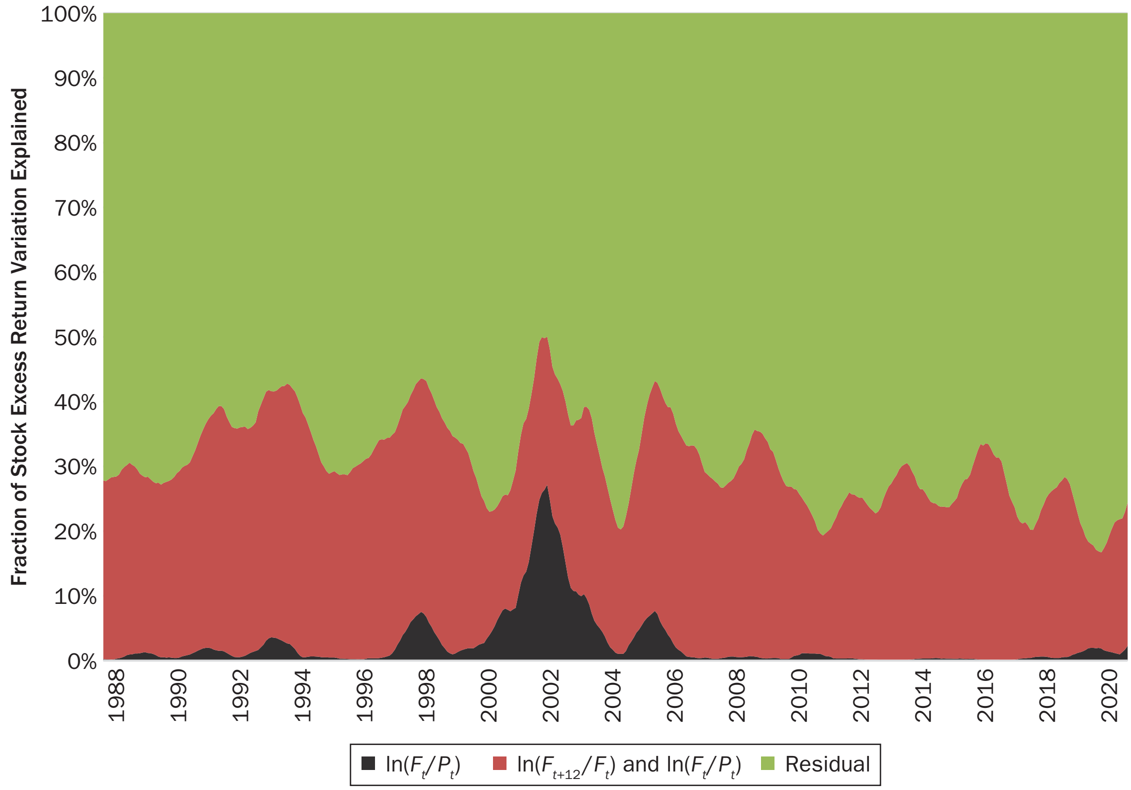
Exhibit 7 reports the regression results. Unsurprisingly, the regression coefficients for ΔFUND are always positive (and are all very strongly significant, with *t*-statistics averaging 16.3). Changes in expectations of fundamentals matter for stock returns, particularly when examining return intervals of a year or longer (see, e.g., Richardson, Sloan, and You 2012 and Easton, Harris, and Ohlson 1992). Similarly, expected returns are strongly associated with realized returns after conditioning for cash flow news. The notable exceptions (bolded rows) are the latter part of the dot-com period (1999 and 2000) and the last three years, where $\ln\left(\frac{F_t}{P_t}\right)$ is either weakly positively or negatively (in the case of 2000 and 2020) associated with future returns. It is important to remember that this regression controls for ex post realizations of cash flow news, so the regression coefficient on $\ln\left(\frac{F_t}{P_t}\right)$ is not the returns solely from value.

Clearly, there is temporal variation in the importance of fundamental information. To help visualize this temporal pattern, we conduct a return variance decomposition in Exhibit 8. We use monthly estimated regression coefficients and rolling 12-month standard deviations of the explanatory variables to compute the fraction of stock returns that can be explained solely by $\ln\left(\frac{F_t}{P_t}\right)$ (black shaded region) and then jointly by $\ln\left(\frac{F_t}{P_t}\right)$ and $\ln\left(\frac{F_{t+12}}{F_t}\right)$ (red shaded region). The green shaded region is the unexplained return variation. It is clear that the combination of fundamentals (expected returns and ΔFUND) explains about 30% of annual return variation, but during certain periods that explanatory power can be much lower. Part of the underperformance of value strategies is linked to the stock market placing less weight on fundamental information.

As a final examination of whether value strategies have changed in recent years, we examine directly the mean reversion in the speculative component of stock prices. Using the same residual income motivated framework, we can decompose the

EXHIBIT 8

Relative Variance Decomposition from Cross-Sectional Regressions of Future 12-Month-Ahead Log Returns



NOTES: This exhibit shows the relative variance decomposition from a cross-sectional regression of future 12-month-ahead log returns, $\ln(R_{t,t+12}) = \ln\left(\frac{P_{t+12}+D_{t+12}}{P_t}\right)$, onto two broad fundamental-based measures. First, we include a lagged valuation multiple, $\ln\left(\frac{F_t}{P_t}\right)$, where $F_t = B_t + \frac{E[X_{t+12}-rB_t]}{1+r} + \frac{E[X_{t+24}-rB_{t+12}]}{[1+r]r}$. This broad value measure is designed to capture expectations of near-term fundamental value. B is the current book value of equity. Earnings expectations are based on consensus forecasts for the next two years (X_{t+12} and X_{t+24} correspond to 12- and 24-month-ahead earnings forecasts, respectively). A firm-specific discount rate is used based on prevailing risk-free rates, a firm-specific beta, and an assumed 3% equity risk premium. Second, we include a measure of fundamental growth computed as $\ln\left(\frac{F_{t+12}}{F_t}\right)$. To keep this fundamental growth measure free of changing expectations of discount rates, we hold r fixed for the growth period. The regression is run every month, and we use monthly estimated regression coefficients and rolling 12-month standard deviations of the explanatory variables to compute the fraction of stock returns that can be explained solely by $\ln\left(\frac{F_t}{P_t}\right)$ (black shaded region) and then jointly by $\ln\left(\frac{F_t}{P_t}\right)$ and $\ln\left(\frac{F_{t+12}}{F_t}\right)$ (red shaded region). The green shaded region is the unexplained return variation. The regression is estimated on the combined US SC and US LC universes with fixed effects included for each capitalization category.

return predictability of $\ln\left(\frac{F_t}{P_t}\right)$. Using the identity described earlier, we decompose log returns over the next 12 months as $\ln(R_{t,t+12}) = \ln\left(1 + \frac{D_{t+12}}{P_{t+12}}\right) + \ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right) + \ln\left(\frac{F_{t+12}}{F_t}\right)$ and then examine how $\ln\left(\frac{F_t}{P_t}\right)$ is associated with each return component. Exhibit 9 reports these results.

As before, we estimate cross-sectional regressions each month over the combined US SC and US LC samples (including fixed effects for capitalization groups) and average monthly regression coefficients across each calendar year (for robustness, we also examined regression specifications with both independent and dependent variables normalized by their cross-sectional standard deviations and found similar results). The first two columns in Exhibit 9 contain the base case regression of $\ln(R_{t,t+12})$ on $\ln\left(\frac{F_t}{P_t}\right)$. In this case, unlike the regression reported in Exhibit 7, the regression does provide a direct indication of the performance of value because we are not controlling for ex post cash flow news. The regression coefficient on $\ln\left(\frac{F_t}{P_t}\right)$ in Exhibit 9 is generally positive, and the average coefficient over the 1987–2020 period is 0.02 (unreported

EXHIBIT 9

Components of Return Predictability for Value Measures

	Dependent Variable							
Year	$\ln(R_{t,t+12})$		$\ln\left(1+\frac{D_{t+12}}{P_{t+12}}\right)$		$\ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right)$		$\ln\left(\frac{F_{t+12}}{F_t}\right)$	
1987	–0.01	*–0.2*	0.02	*12.0*	0.32	*8.8*	–0.34	*–8.9*
1988	0.06	*2.7*	0.02	*10.6*	0.41	*12.5*	–0.36	*–10.2*
1989	0.00	*0.4*	0.02	*9.2*	0.32	*10.5*	–0.32	*–9.8*
1990	–0.12	*–3.9*	0.02	*10.7*	0.26	*7.9*	–0.37	*–11.4*
1991	–0.02	*–0.6*	0.02	*11.0*	0.32	*11.4*	–0.34	*–10.3*
1992	0.11	*4.6*	0.02	*16.0*	0.36	*14.5*	–0.27	*–9.1*
1993	0.11	*4.4*	0.01	*14.6*	0.40	*16.3*	–0.31	*–10.9*
1994	0.03	*1.4*	0.02	*16.1*	0.31	*12.4*	–0.30	*–11.4*
1995	–0.02	*–0.7*	0.02	*17.1*	0.29	*11.4*	–0.32	*–12.0*
1996	0.02	*0.7*	0.02	*14.4*	0.31	*13.0*	–0.31	*–11.9*
1997	0.21	*9.5*	0.01	*14.7*	0.40	*19.7*	–0.21	*–9.0*
1998	0.04	*1.5*	0.01	*13.2*	0.27	*10.4*	–0.24	*–8.7*
1999	–0.17	*–5.6*	0.01	*13.9*	0.17	*6.1*	–0.33	*–13.8*
2000	**–0.21**	***–7.3***	**0.01**	***14.6***	**0.09**	***4.1***	**–0.30**	***–15.3***
2001	0.39	*16.7*	0.01	*15.9*	0.46	*23.5*	–0.08	*–3.9*
2002	0.25	*11.7*	0.01	*15.4*	0.36	*15.0*	–0.12	*–4.3*
2003	0.02	*0.6*	0.01	*14.0*	0.24	*11.0*	–0.23	*–9.9*
2004	0.08	*5.3*	0.01	*12.0*	0.36	*20.7*	–0.30	*–14.4*
2005	0.10	*6.5*	0.01	*9.4*	0.26	*14.4*	–0.17	*–7.6*
2006	–0.01	*–0.4*	0.01	*7.6*	0.22	*11.4*	–0.24	*–11.0*
2007	–0.03	*–1.1*	0.01	*7.1*	0.21	*9.6*	–0.24	*–9.7*
2008	–0.05	*–1.7*	0.01	*6.2*	0.25	*8.5*	–0.28	*–9.0*
2009	–0.01	*0.0*	0.01	*2.6*	0.29	*9.7*	–0.29	*–8.9*
2010	0.01	*–0.1*	0.00	*3.9*	0.43	*16.2*	–0.42	*–15.2*
2011	–0.01	*–0.7*	0.00	*3.5*	0.28	*10.7*	–0.28	*–10.3*
2012	0.02	*0.9*	0.01	*5.1*	0.22	*8.9*	–0.20	*–7.6*
2013	0.03	*1.8*	0.01	*4.8*	0.23	*9.7*	–0.20	*–7.6*
2014	0.02	*1.6*	0.01	*5.8*	0.24	*10.4*	–0.22	*–9.0*
2015	0.02	*0.9*	0.01	*4.3*	0.19	*8.1*	–0.17	*–6.7*
2016	0.01	*0.5*	0.01	*5.3*	0.16	*7.0*	–0.15	*–6.3*
2017	0.03	*2.2*	0.01	*5.2*	0.25	*11.6*	–0.22	*–9.3*
2018	–0.05	*–3.7*	0.01	*6.0*	0.17	*7.5*	–0.23	*–9.8*
2019	–0.06	*–3.4*	0.01	*7.8*	0.11	*5.3*	–0.17	*–8.8*
2020	–0.12	*–7.0*	0.01	*9.1*	–0.01	*–0.5*	–0.11	*–4.6*

NOTES: This exhibit reports calendar year averages of monthly cross-sectional regressions. Each month, we run the following regression: $\ln(R_{t,t+12}) = a + b \cdot \ln\left(\frac{F_t}{P_t}\right) + \varepsilon$. $\ln\left(\frac{F_t}{P_t}\right)$ is a broad based valuation measure, and $F_t = B_t + \frac{E[X_{t+12} - rB_t]}{1+r} + \frac{E[X_{t+24} - rB_{t+12}]}{(1+r)r}$. F_t is designed to capture expectations of near-term fundamental value. *B* is the current book value of equity. Earnings expectations are based on consensus forecasts for the next two years (X_{t+12} and X_{t+24} correspond to 12- and 24-month-ahead earnings forecasts, respectively). A firm-specific discount rate, *r*, is used based on prevailing risk-free rates, a firm-specific beta, and an assumed 3% equity risk premium. We further decompose 12-month-ahead log returns as $\ln(R_{t,t+12}) = \ln\left(1 + \frac{D_{t+12}}{P_{t+12}}\right) + \ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right) + \ln\left(\frac{F_{t+12}}{F_t}\right)$ and examine the predictive ability of $\ln\left(\frac{F_t}{P_t}\right)$ across the three components. The *t*-statistics are italicized and reported to the right of regression coefficients.

Newey–West-corrected Fama–Macbeth *t*-statistic of 1.17). Consistent with earlier results, however, there are distinct periods in which value strategies have performed poorly (notably 1990; the latter part of the dot-com period; 2008; and the last three years).

The remaining columns repeat the regression holding the explanatory variable, $\ln\left(\frac{F_t}{P_t}\right)$, fixed and separately assessing the three additive components of returns. The two main components of future returns are multiple expansion, $\ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right)$, and fundamental news, $\ln\left(\frac{F_{t+12}}{F_t}\right)$. The consistently positive regression coefficients for the multiple expansion regression tells us there is strong mean reversion in valuation multiples (a necessary, but not sufficient, condition for value strategies to work).[2] The consistently negative regression coefficients for the fundamental news regression tells us that cheap companies may be cheap for a reason: As a group, they have deteriorating future fundamentals. Penman (1991) and Fama and French (1995) noted this effect previously. These two effects conflict, with mean reversion in multiples benefitting value strategies and deteriorating fundamentals hurting value strategies. As Kok, Ribano, and Sloan (2017) noted for simple B/P strategies, the latter can dominate the former, challenging the success of simple value strategies.

Notably, the periods of strongest underperformance of our broad value measure (1990, 1999, 2000, 2008, 2018, 2019, 2020) are periods in which the deterioration in fundamentals dominates mean reversion in multiples, but most of that difference is from prices deviating further from fundamental value. Consider the period 2000: The regression coefficient for $\ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right)$ is 0.09, which is 65% lower than its full-sample average. In contrast, the regression coefficient for $\ln\left(\frac{F_{t+12}}{F_t}\right)$ is –0.30, which is 19% lower than its full-sample average. This general pattern is also evident in 1999, 2018, 2019, and 2020. Thus, when value underperforms significantly, it is primarily attributable to a widening gap between prices and fundamentals rather than a greater deterioration in fundamentals of cheap securities.

Consistent with the earlier results, fundamentals do matter for stock returns, but there are periods in which stock prices become less connected with fundamental information, and in such periods, value

[2] Mean reversion is typically evidenced by showing a negative coefficient in regressions of the form change in $X = a + bX$ + error (i.e., $b < 0$), where X is our valuation ratio, $\ln\left(\frac{F_t}{P_t}\right)$. In our additive decomposition of returns, the multiple expansion variable is the inverse of the change in $\ln\left(\frac{F_t}{P_t}\right)$; hence, we expect to see a positive association if there is mean reversion.

strategies underperform. This has happened before, is happening now, and will likely happen again. However, absent a crystal ball allowing an investor to know ahead of time whether the market is less in tune with fundamentals, the implication for value strategies is not clear.

Before concluding, there is one last, but very important, point to make about value strategies. Value strategies, as analyzed in this article, are typically not used on a stand-alone basis. Investors tend to incorporate value measures with other well-known strategies (e.g., momentum and quality/defensive). Given that (1) each of these investment themes works well individually and (2) each of the themes has a low or negative correlation (value and momentum are negatively correlated, as are value and profitability), a risk-balanced combination across themes is a powerful diversifier. This diversification benefit of value strategies cannot be overstated. This article has focused on assessing criticism leveled at value strategies on a stand-alone basis. Although we have found these criticisms generally lacking in merit, none of those criticisms challenged the powerful diversification potential of combining measures of value with momentum, defensive, and other investment themes.

CONCLUSION

Despite extensive prior research supporting value strategies (across asset classes, time periods, and geographies), the recent underperformance of value in the equity class has led some to question whether systematic value strategies are now broken. We assess many of these criticisms, including (1) increased share repurchase activity; (2) the changing nature of firm activities, the rise of intangibles, and the impact of conservative accounting systems; (3) the changing nature of monetary policy and the potential impact of lower interest rates; and (4) value measures being too simple to work. We find little empirical evidence to support them.

What we do find, consistent with academic research back to at least Ball and Brown (1968), is strong evidence that fundamental (i.e., earnings) information is relevant for stock prices. Not surprisingly, a value investor armed with a crystal ball containing knowledge of future earnings would have done exceptionally well. Indeed, changes in earnings expectations over the annual horizon explain a lot of stock return variation. But there is temporal variation in the relevance of fundamental information, and when that is low, as it has been recently, value strategies will suffer.

ACKNOWLEDGMENTS

We thank Cliff Asness, Sunny Balasubramanian, Harrison Beard, Alfie Brixton, Brad Cornell, Arthur Fischer-Zernin, Andrea Frazzini, Antti Ilmanen, Thom Maloney, Zach Mees, Michael Mendelson, Toby Moskowitz, Lars Nielsen, Diogo Palhares, and Kari Sigurdsson for helpful discussion and comments.

REFERENCES

Amenc, N., F. Goltz, and B. Luyten. 2020. “Intangible Capital and the Value Factor: Has Your Value Definition Just Expired?” *The Journal of Portfolio Management* 46 (7): 83–99.

Asness, C. 2003. “Fight the Fed Model.” *The Journal of Portfolio Management* 30: 11–24.

——. “How Can a Strategy Still Work If Everyone Knows about It?” Working paper, AQR Capital Management, 2015.

Asness, C., and A. Frazzini. 2013. "The Devil in HML's Details." *The Journal of Portfolio Management* 39: 49–68.

Asness, C., A. Frazzini, R. Israel, and T. Moskowitz. 2015. "Fact, Fiction, and Value Investing." *The Journal of Portfolio Management* 42: 34–52.

Asness, C., J. Friedman, R. Krail, and J. Liew. 2000. "Style Timing: Value vs. Growth." *The Journal of Portfolio Management* 26: 50–60.

Asness, C., T. Hazelkorn, and S. Richardson. 2018. "Buyback Derangement Syndrome." *The Journal of Portfolio Management* 44: 50–57.

Asness, C., T. Moskowitz, and L. Pedersen. 2013. "Value and Momentum Everywhere." *The Journal of Finance* 68: 929–985.

Asness, C., R. Porter, and R. Stevens. "Predicting Stock Returns Using Industry-Relative Firm Characteristics." Working paper, AQR Capital Management, Iowa State University, and Stone Ridge, 2000.

Ball, R., and P. Brown. 1968. "An Empirical Evaluation of Accounting Income Numbers." *Journal of Accounting Research* 6: 159–178.

Berk, J., R. Green, and V. Naik. 1999. "Optimal Investment, Growth Options, and Security Returns." *The Journal of Finance* 54: 1153–1608.

Cochrane, J. 1991. "Production-Based Asset Pricing and the Link between Stock Returns and Economic Fluctuations." *The Journal of Finance* 46: 209–237.

——. 1996. "A Cross-Sectional Rest of an Investment-Based Asset Pricing Model." *Journal of Political Economy* 104: 572–621.

Cooper, M., H. Gulen, and M. Schill. 2008. "Asset Growth and the Cross-Section of Stock Returns." *The Journal of Finance* 63: 1609–1651.

Dechow, P., and R. Sloan. 1997. "Returns to Contrarian Investment Strategies: Tests of Naïve Expectations Hypothesis." *Journal of Financial Economics* 43: 3–27.

Dukes, R., T. Dyckman, and J. Elliott. 1980. "Accounting for Research and Development Costs: The Impact of Research and Development Expenditures." *Journal of Accounting Research* 18: 1–26.

Easton, P., T. Harris, and J. Ohlson. 1992. "Aggregate Accounting Earnings Can Explain Most of Security Returns: The Case of Long Return Intervals." *Journal of Accounting and Economics* 15: 119–142.

Edmans, A. "The Case for Stock Buybacks." *Harvard Business Review*, September 15, 2017.

Fama, E., and K. French. 1992. "The Cross-Section of Expected Stock Returns." *The Journal of Finance* 47: 427–465.

——. 1993. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics* 33: 3–56.

——. 1995. "Size and Book-to-Market Factors in Earnings and Returns." *The Journal of Finance* 50: 131–155.

——. 2000. "Forecasting Profitability and Earnings." *The Journal of Business* 73: 161–175.

——. "The Value Premium." Working paper, University of Chicago, 2020.

Feltham, G. A., and Ohlson, J. A. 1995. "Valuation and Clean Surplus Accounting for Operating and Financial Activities." *Contemporary Accounting Research* 11: 689–731.

Fried, J., and C. Wang. "Short-Termism and Capital Flows." Working paper, 2017.

Gomes, J., L. Kogan, and L. Zhang. 2003. "Equilibrium Cross-Section of Returns." *Journal of Political Economy* 111: 693–732.

Green, J., J. Hand, and M. Soliman. 2011. "Going, Going, Gone? The Apparent Demise of the Accruals Anomaly." *Management Science* 57: 797–816.

Ilmanen, I., R. Israel, T. Moskowitz, A. Thapar, and F. Wang. 2019. "How Do Factor Premia Vary over Time? A Century of Evidence." Working paper, AQR Capital Management, 2019.

Israel, R., and T. Moskowitz. 2013. "The Role of Shorting, Firm Size and Time on Market Anomalies." *Journal of Financial Economics* 108: 274–301.

Kessler, S., B. Scherer, and J. Harries. 2020. "Value by Design?" *The Journal of Portfolio Management* 46: 25–43.

Kok, U. W., J. Ribando, and R. Sloan. 2017. "Facts about Formulaic Value Investing." *Financial Analysts Journal* 73: 81–99.

Lakonishok, J., A. Shleifer, and R. Vishny. 1994. "Contrarian Investment, Extrapolation and Risk." *The Journal of Finance* 49: 1541–1578.

Lev, B. "The Deteriorating Usefulness of Financial Report Information and How to Reverse It." Working paper, New York University, 2017.

Lev, B., and T. Sougiannis. 1996. "The Capitalization, Amortization and Value-Relevance of R&D." *Journal of Accounting and Economics* 21: 107–138.

Lev., B., and A. Srivastava. "Explaining the Recent Failure of Value Investing." Working paper, New York University and University of Calgary, 2020.

Maloney, T., and T. Moskowitz. "Value and Interest Rates: Are Rates to Blame for Value's Torments?" Working paper, AQR Capital Management, 2020.

Nissim, D., and S. Penman 2001. "Ratio Analysis and Equity Valuation: From Research to Practice." *Review of Accounting Studies* 6: 109–154.

Ohlson, J. 1995. "Earnings, Book Values, and Dividends in Equity Valuation." *Contemporary Accounting Research* 12: 661–687.

Penman, S. 1991. "An Evaluation of Accounting Rate of Return." *Journal of Accounting, Auditing, and Finance* 6: 233–255.

——. *Accounting for Value*. New York: Columbia Business School Publishing, 2010.

Penman, S., and X. Zhang. 2002. "Accounting Conservatism, Quality of Earnings, and Stock Returns." *The Accounting Review* 77: 237–264.

Penman, S., F. Reggiani, S. Richardson, and İ. Tuna. 2018. "A Framework for Identifying Accounting Characteristics for Asset Pricing Models, with an Evaluation of Book-to-Price." *European Financial Management* 24: 488–520.

Peters, R., and L. Taylor. 2017. "Intangible Capital and the Investment-q Relation." *Journal of Financial Economics* 123: 251–272.

Richardson, S., R. Sloan, and H. You. 2012. "What Makes Stock Prices Move? Fundamentals vs. Investor Recognition." *Financial Analysts Journal* 68: 30–50.

Sloan, R. 2019. "Fundamental Analysis Redux." *The Accounting Review* 94: 363–377.

Zhang, L. 2005. "The Value Premium." *The Journal of Finance* 60: 67–103.

DISCLAIMER

The authors are employees of AQR Capital Management, LLC, which is a global investment management firm that may or may not apply similar investment techniques or methods of analysis as described herein. The views expressed in this article are those of the authors and not necessarily those of AQR.