Is (systematic) value investing dead?

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Abstract

Value investing is the age-old investment strategy that 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 statement variables. Recently, there has been much written about the death of value investing. While undoubtedly many systematic approaches to value investing have suffered recently, we 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. We also address a series of critiques levelled at value investing and find them generally lacking in substance.

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1. Introduction

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 for 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 (i) everyone knows about it or (ii) times are different post the financial crisis (e.g., lower interest rates or changing business models in the 'new' economy)?

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 firm's business models should be at the heart of every investor's toolkit. A value investor is challenging 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 'intrinsic' view come from? It comes from a deep understanding of the value creation potential for that firm. That encompasses an understanding of the goods and services that a company provides, the competitive landscape in which that firm operates, the potential for growth in that 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. From the perspective of an active investor wishing to challenge the market price, that investor's view on intrinsic value may differ from the actual share price due 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 (i) errors in expectations with respect to fundamentals, (ii) a risk premium for exposure to stocks that share exposure to a non-diversifiable source of risk that is reflected in their current cheapness, and/or (iii) 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 (i) future earnings growth, particularly long-term growth, and its associated risks, and (ii) 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, Sloan and

Sweeney, 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 in 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 to identifying intrinsic value, rather present the case for value investing.

Despite decades of evidence supporting the efficacy of systematic versions of value investing across (i) many stock markets (developed and emerging), (ii) many time periods (both before and after the publication of the original papers), and (iii) other asset classes (government bonds, corporate bonds, currencies and commodities), the recent evidence for value strategies in equity markets, particularly in the U.S., has been poor. That may be an under-statement as 2018 and 2019 have been extremely painful years for value strategies generally (following a pretty poor period since the Global Financial Crisis). That 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 the continued efficacy of value strategies. These criticisms include: (i) 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) (ii) the explosion in share repurchase activity of firms has changed the nature of book equity rendering B/P measures less useful, (iii) the growing importance of intangibles and the failure of the accounting system to record such value on the financial statements renders value measures anchored to current financial statements useless, (iv) central bank interventions and the low interest rate environment over the last decade have distorted asset prices via lowering discount rates that negates the efficacy of value strategies, and (v) systematic value strategies are just too naïve to work as everyone knows about them. We address each of these criticisms in this paper.

The remainder of the paper proceeds as follows. Section 2 briefly describes standard equity valuation frameworks and uses illustrative examples to make clear what it is that a systematic value investing approach captures. Section 3 lays out the empirical facts as it pertains to the performance of equity value strategies over the last few decades. Section 4 lists several criticisms as to why value investing approaches are flawed and/or dead and then assesses whether those criticisms are supported by the data (short answer: minimally). Section 5 returns to the starting premise of the importance of fundamental information for the determination of stock prices and shows that measures of expected returns like E/P combined with measures of changes in expectations in fundamentals have, and continue to, explain the majority of return variation over horizons that value investors care about. Section 6 concludes.

2. Framework

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

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

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:

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

While equivalent to the discounted divided model, this alternative valuation expression has the benefit of focussing 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 above 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, effectively assuming further speculation is fruitless. This truncates the forecasting exercise into (i) current observables, such as B, (ii) near term forecasts of residual income, $X_{i,t+1} - rB_{i,t}$, and (iii) longer term (speculative) forecasts of future residual income and associated growth. Consistent with Penman (2010) this can be written as:

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

In this way we have focussed the equity valuation on near term observables form the balance sheet (B as an indicator for invested capital) and value creation from near term earnings, X. The first term is known, as 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 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. Further, 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. Yes, 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 comprised of the final component, labelled *Speculation* above, 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 (discussed in detail in section 5).

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 at December 31, 2019. These two companies both belong to

GICS industry 25301040 (Restaurants). SBUX is a larger company (market capitalization of $103.8 billion vs. $23.3 billion, annual revenues of $26.5 billion vs. $5.5 billion, and annual net income of $3.6 billion vs. $387 million) and more geographically diversified (SBUX generates 73 percent 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, and as such our forecasts of dividends need to be inclusive of all equity transactions. This makes the case studies of SBUX and CMG interesting as one of the critiques of *B/P* that we discuss later focuses on stock repurchase activity.

Figure 1 (2) visualize the decomposition of stock price for SBUX (CMG) into the three components (i) Book Value, B, (ii) Value from Short Term Accounting (next two years of residual income capitalized), and (iii) the residual difference labelled 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 relative to SBUX. The inference is simple: CMG relative to SBUX has a greater proportion of longer-term residual income and associated growth embedded into 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 ensure they receive, or are likely to receive, fundamental value sooner rather than later. This is a simple idea and one that has worked remarkable well across time periods, geographies and asset classes (though not recently for equities).

3. The Facts

3.1 The data and the measures

Table 1 provides full details of the sample firms used in our empirical analysis. Sample firms must be constituents of the BARRA GEMM risk model, have positive market capitalization and have 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 require (i) each country to have at least five securities in a given month, (ii) each county-industry grouping to have at least two securities in a given month, and (iii) each country to have at least 5,000 firm-month observations (helps ensure a minimal data set for our calendar time portfolio analysis). We group firms into two size categories based on market capitalization. Precise cut-offs vary across country, but for large capitalization (LC) we keep approximately the largest 20 percent of securities based on market capitalization and the top 15 percent 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 the country (a consequence being that the recent decade long drawdown in value will be a significant portion of the sample).

Table 1 panel A (B) reports descriptive information about our sample of LC (SC) securities. Our sample firms cover firms across 21 (25) countries for LC (SC). Each panel is split into two portions, the upper (lower) portion for developed (emerging) markets. The typical cross-section of developed LC (SC) securities contains 1,960 (2,878) firms and for emerging LC (SC) securities the typical sample size is 406 (984) firms. There is a clear concentration of US and Japanese firms in developed markets; and Taiwan, Korea and China account for most emerging market firms. There is a reasonable sector coverage within each country and market capitalization category, with slightly better coverage in developed markets and for countries with a greater number of firms. We also report the average market capitalization (in billions of USD) for each firm in each country as well as the average market capitalization across each country. The average LC (SC) firm in developed markets has a market capitalization of 11.0 (0.7) billion. The average LC (SC) firm in emerging markets has a market capitalization of 8.1 (0.5) billion. The average market capitalization across all countries is 633 billion and the average total market capitalization is 29.1 trillion. Our sample covers most economically important and investible firms across developed and emerging markets.

The typical start date for our sample is 1990 (1997) for developed (emerging) markets. Our sample period is notably shorter than that considered in most academic literature dedicated to the topic of value investing. This is a deliberate choice as we want to (i) focus on investible securities where we have high quality market data, especially with respect to liquidity, (ii) be able to assess the evidence for/against value investing and the associated criticisms across many countries over a similar sample period (not just the US), and (iii) the more recent period has been the focus of much criticism on (systematic) value investing. Prior research has already demonstrated the efficacy of value investing in earlier (and far longer) time periods.

The fundamental data used for our value metrics are sourced from Worldscope prior to 2004 and XpressFeed after 2004. Prior to 2009, we assume financial statement information is known to the market only six months after the end of the fiscal period and we limit ourselves to data from annual financial statements across all firms. After 2009 we use point in time datasets to ensure that financial statement data is used as soon as it is known to capital market participants, and we use a waterfall logic to use the most recently available financial statement information (annual, semi-annual or quarterly). We use five separate measures for value, four based on trailing data and one measure based on analyst estimates. All value measures use the most recently available price information (see e.g., Asness and Frazzini, 2013). We do not limit our sample to have all five measures available for each firm, instead we use the maximum available sample for each measure. The respective measures are described below.

B/P is the traditional book-to-price ratio. Book equity is total common shareholders equity as reported in the consolidated balance sheet. For financial firms we make an adjustment for preferred stock. The deflator for B/P is total equity market capitalization.

E/P is the standard trailing earnings-to-price ratio. We use net income adjusting for preferred dividends as our measure of earnings. The deflator for E/P is total equity market capitalization.

FEP is the forward earnings-to-price ratio. We use I/B/E/S mean consensus estimates for forward earnings. We blend one and two year ahead earnings forecasts to have a constant one-year forecasted horizon across firms. The deflator for FEP is extracted from I/B/E/S to ensure consistency in per share data.

S/EV is our sales to enterprise value ratio. Sales is as reported on the income statement. As sales are generated by the entire operations of the firm it is appropriate to deflate this by enterprise value (EV) and not just equity market capitalization. EV is computed as the sum of total equity market capitalization, preferred stock, minority interest and total debt. The latter three components are based on reported book values, not market values, as it is difficult to get reliable market data for these items for our global sample of firms (and the differences between book and market value is likely to be small for most firms).

CF/EV is our cash flow to enterprise value ratio. Cash flows are computed as operating cash flows with an after-tax adjustment for interest expense (current accounting rules treat interest payments as an operating activity). EV is computed as above.

3.2 Evidence from simple sorts (minimal portfolio design choices)

We start with the traditional academic approach of sorting securities each month based on each of the valuation measures described above. We compute average returns (equal and value weighted) for five quintile portfolios. Equal-weighted portfolios may be reasonable for the LC universe, but are less representative for the SC universe. Table 2 reports time series averages of these quintile portfolio returns. Q1 (Q5) is the quintile corresponding to stocks with the lowest (highest) value scores. We also report a dollar-neutral long Q5/short Q1 portfolio (labelled Q5-Q1) and its associated test statistic in the final column of each panel. For brevity, we just report statistics for these simple portfolios for our US LC (panels A and B) and US SC (panels C and D) universes. These portfolios are 'simple' in that they sort the entire cross-section of securities within each market capitalization category and ignore various portfolio construction choices (notably industry neutralization). Our purpose here is simply to set the stage for the efficacy of systematic value strategies for our time period. All four panels in Table 2 confirm prior research that value measures are associated with future excess returns. While there is generally a monotonically positive relation between quintile buckets and future excess returns across the set of value measures, the evidence is strongest for the SC universe, and stronger for E/P, S/EV and CF/EV type metrics. The evidence for value strategies will become more evident in the next section when we greatly expand the sample across countries and introduce more standard portfolio construction choices. We will address the relative weakness of B/P, especially for the LC universe, in section 4.1.

3.3 Evidence from value portfolios (inclusive of certain portfolio design choices)

Table 3 reports Sharpe ratios for long-short portfolios formed based on the individual value metrics described in section 3.1, as well as an equal risk weighted (using full sample volatilities) combination of the five value measures. We group stocks into sectors ('peer group') within each country and subtract the median value score from each stock's value measure grouping. We then rank and standardize the demeaned value measure across all stocks in each country. For regional portfolios (e.g., developed-ex-US and emerging) we then average across countries using the square root of the number of stocks within a country as weights. This gives more weight to the countries with greater investment breadth. These hypothetical portfolios are rebalanced monthly. We do not account for transaction costs here, nor other important aspects of portfolio construction (e.g., beta neutrality, volatility targeting, position limits, feasibility and cost of shorting etc.). Yes, these are all important considerations, but our purpose here is to revisit claims on the basic existence of value investing strategies and critiques levelled at systematic investment approaches that are not related to portfolio construction details.

Across all 30 possible combinations of individual value strategies (2 market capitalization categories, 3 regions and 5 individual value measures), 24 are significant at conventional levels (test-statistic greater than 2) and 15 are significant at more stringent significance levels (test-statistic above 3). And this is over a shorter, more recent, time period leading to lower test-statistics than are typically seen for value strategies. Importantly, a diversified combination across the individual value metrics generates a very strongly positive risk adjusted return (test-statistics well above conventional levels). Asness, Frazzini, Israel and Moskowitz (2015) make a similar point on the diversification benefit of multiple value measures for a set of US securities.

Panel A (B) of Figure 3 reports the Sharpe ratio and associated test statistic for the combined value strategy (VAL) applied to LC (SC) securities in each country as well as aggregates for developed and emerging markets. The left (right) vertical axis reports the Sharpe ratio (Fama-Macbeth test statistic) for the country/region specific VAL strategy. As Lewellen (2010) notes, the Fama-Macbeth test statistic is a simple transformation of the Sharpe ratio, multiplying it by sqrt(12)/sqrt(N), where N reflects the number of months of available data. Across our selected countries the time period covered is not identical (see Table 1) so the transformation will vary across countries/regions with longer sample periods. For almost all countries there is a positive risk adjusted return associated with systematic value strategies with clear economic and statistical significance in the larger countries and across regions (Australia and Singapore in the SC universe are the exceptions). The overall message is that a diversified systematic capture of 'value' has done well over the last three decades across developed and emerging markets.

There are many important choices in portfolio construction including (i) universe selection (e.g., liquidity tiering, where you choose to build larger positions in the more liquid, easier to trade securities), (ii) measure choices (e.g., just B/P or multiple measures of value), (iii) mapping a measure to a signal (e.g., simple ranks, signal weighting, market weighting etc.), (iv) controlling for unintended exposures (e.g., beta or sector), and (v) the myriad of execution choices (rebalancing frequency, impact of trading costs, position sizing etc.). The interested reader can explore Israel, Jiang and Ross (2018) which shows how many of these choices can impact, and improve, style-based portfolios. All choices, while seemingly innocuous, can lead to meaningful improvements in returns over time. Indeed, Kessler, Scherer and Harries (2020) conduct an exhaustive analysis of 3,168 alternative versions of value portfolios spanning signal definition, signal weighting, sizing, sector adjustments and rebalancing frequency. The two key areas of return differentiation were signal definitions and sector adjustments. Our analysis in Table 3 confirms the importance of signal definition, notably that it is better to combine multiple value measures together. We now assess the incremental importance of sector adjustment in Table 4.

We present results for the VAL strategy across the LC and SC universe as before and show 3 variants of portfolio construction. The first row contains portfolios where there is no adjustment for sector (i.e., the rank and standardization step is applied across all firms in a country). The second row contains portfolios with our standard sector (GICS level 2) adjustment (i.e., the rank and standardization step is applied across all firms within a sector-country group) which is the base case result we reported in Table 3. The third row contains portfolios with a more granular industry (GICS level 4) adjustment. There is a clear improvement in Sharpe ratio as you control for sector or industry membership (the average Sharpe ratio increases from 0.73 to 0.88 with sector level adjustments and to 0.96 with industry level adjustments). Both Asness, Porter and Stevens (2000) and Kessler, Scherer and Harries (2020) note the importance of sector demeaning in identifying successful value strategies. Accounting rules can vary across both sectors and countries, and this simple demeaning step may be an efficient way to control for certain unintended effects. This is important as some of the criticisms we will discuss later (e.g., the rise of intangible assets or declining interest rates) become less relevant when considering peer-adjusted value metrics. In addition to enhancing comparability across stocks, sector/industry-neutralization improves the effective breadth of the value strategy, as it emphasizes the benefit of a large number of stock-specific views over a smaller number of sector/industry views.

Finally, Figure 4 (5) illustrates the cumulative return profile (rolling 2-year Sharpe ratio) for the VAL strategy across using the longest time period available for each market capitalization and region category. Over the full sample period systematic value strategies generated positive risk adjusted returns. However, the last decade has seen a marked reduction in the performance of systematic value strategies, and particularly so for the US LC and US SC samples. While the empirical analysis in Tables 2-4 and Figures 3-5 is not novel, as it merely confirms prior research, it is important to set the stage for our analysis of whether, and how, systematic value strategies have 'changed' in recent years.

4. The criticisms

4.1 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 U.S. listed stocks covered by CRSP. This broad sample gives considerable weight to small and less liquid stocks which are of little relevance to large investors. Is it the case that B/P has any efficacy for large stocks? Israel and Moskowitz (2013) find that the value premium, as reflected by B/P, decreases with market capitalization and is weakest for the largest securities. Asness, Frazzini, Israel and Moskowitz (2015) make a similar point on the limited usefulness of HML across different time periods for US large capitalization 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 (large capitalization 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 January 1987 through to December 2019, the EARNYLD (VALUE) factor return had an annualized Sharpe ratio of 0.96 (0.03). Furthermore, the VALUE factor return has been in drawdown since February 2007, while the EARNYLD factor return has only been in drawdown since May 2015. Similarly, in a recent paper, Kessler, Scherer and Harries (2020) find 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, Reggiani, Richardson and Tuna (PRRT, 2018) make this point explicitly. B/P is more important for stocks where there is higher expected earnings growth, and where that earnings growth is at risk. Indeed, PRRT show 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. If you limit the sample to just the largest stocks, and focus on simple sort portfolios, then B/P is <u>not</u> significant in the presence of E/P. Indeed, we showed evidence of this in Table 2 as described in section 3.2.

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 utilized 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) will 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 via 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 section 4.3. 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). While our aim in this paper 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 (i) price-based momentum measures, (ii) fundamental-based momentum measures, and (iii) 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, Frazzini, Israel and Moskowitz (2015) demonstrate that, even assuming zero expected returns from value, the negative correlation with momentum and quality, would still lead to a non-trivial (about 15 percent) exposure to value.

4.2 Explosion in share repurchases

Much has been written about the growing dollar amount spent by companies in repurchasing their own stock. While much of this hyperbole is overblown (see e.g., Edmans, 2017, Friend 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 in section 2 is a good example of this. In the fiscal year ended September 30, 2018 (2019), SBUX issued $5.6 ($1.6) billion of long-term debt and repurchased about $7.1 ($10.2) billion of common stock. This transaction effectively levered the balance sheet and reduced the book value of equity to -$6.2 billion as at September 30, 2019 from $5.5 billion at September 30, 2017. 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. Such firms are typically excluded from systematic portfolios (i.e., a requirement for B/P portfolios is typically that B > 0). The increased use of stock repurchases coupled with declining and potential negative book values could reduce the investment opportunity for B/P strategies. As we discuss later there is only a small fraction of firms with B < 0 so their exclusion per se 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 etc.) are not value creating activities and as such, correctly bypass the income statement. These transactions do affect the balance sheet as cash, or some other asset, is typically used or given as consideration for these transactions. But this is not a problem per se. As, and when, a company engages in direct transactions with capital markets it will change (i) the size of the firm, (ii) the leverage of the firm, and (iii) expectations of how management will generate free cash flows going forward. All of which 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 of the 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 un-do or adjust net dividends. In fact, net dividends and no arbitrage pricing is the basis by which you can link stock prices to accounting fundamentals.

Figure 1 for the decomposition of SBUX stock price makes this point clear. Yes, book value of equity will become increasingly less important as share repurchases would 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 as share repurchases have been most common in the US. In each size universe we sort stocks based on the trailing twelve-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 change in 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 value to work less in more recent years as the intensity of repurchase activity has increased over time. Table 5 reports the results.

Over our time period 58 (36) percent of US SC (LC) stocks engage 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 median market capitalization percentile of zero repurchase firms is 0.27 (0.77) for SC (LC) firms respectively, whereas repurchasing firms are at the 0.32 (0.81) market capitalization percentile in SC (LC) respectively. In unreported analyses, consistent with prior research (e.g., Friend and Wang, 2017), we also find increasing levels of share repurchase activity over time. Over the last five years (2014-2019) some 60 (80) percent of SC (LC) firms now engage in share repurchase activity.

We also note the fraction of the sample where 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 percent) of firms having negative book values (and such firms are excluded from the B/P portfolios). 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 percent in more recent years, and closer to 6 percent for the high share repurchase sub-sample 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 sub-sample. 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 VAL combined portfolio, the evidence is muted. In unreported tests we can reject the null hypothesis of equal average returns across pairs (e.g., High vs. Zero, Low vs. Zero and Zero vs. Low) for only two combinations out of the possible 36 combinations (6 measures, 2 size universes, 3 repurchase partitions), and that difference was for S/EV in SC.

To help assess if there is any temporal variation in the impact that share repurchase activity may have on the performance of systematic B/P portfolios, in Figure 6 we report rolling 2-year Sharpe ratios for B/P portfolios for the 'Zero', 'Low' and 'High' share repurchase subgroups. Panel A (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.

4.3 Growing importance of intangible assets

A limitation of all valuation approaches is the quality of the data inputs. For the equity valuation framework outlined in section 2 this means that the quality of the financial statements needs to be sufficiently precise. But 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 ever 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? There are some (e.g., Lev, 2017) who argue strongly that financial reporting information is no longer relevant, in part due to accounting standard setters 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; and 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. While we can all argue that the accounting system may miss capitalizing certain aspects of value creating activity, such as research and development

(R&D) as well as advertising, we also know what the rules are that govern the accounting system. We are all free to make adjustments to 'un-do' 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) suggest that book values tend to mean revert to prices instead of prices mean reverting to book values. But 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 mean reversion of components of value strategies in section 5.

If the source of measurement error in an accounting attribute is due to an accounting standard systematically missing an asset (e.g., research and development) 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., Amir and Lev, 1996). More recently, Lev and Srivastava (2020) suggest that (i) capitalizing R&D expenditures and Selling, General & Administrative expenses, and (ii) amortizing this 'asset' over industry specific schedules 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 as significant choices are needed to reconstruct financial statements and ensure that they continue to articulate correctly. HOLT (Credit Suisse) and New Constructs typically re-compute earnings and cash flow metrics by adjusting reported financial statement 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). 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, large capitalization firms.

To help document whether there is any efficacy to 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 un-do 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 & 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 paper.

Under the reasonable assumption that the changes Credit Suisse HOLT make 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. Figure 7 reports rolling 2-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 5 years as this is where value underperformance has been most striking, and the recent claims about the rise of intangible assets has been strongest. There is considerable similarity in the performance of value measures over the last 5 years (especially for US LC where there is notable decline in the performance of value strategies across the board). A key inference to be drawn here is that the recent under-performance of value strategies extends to value measures that attempt to correct for deficiencies in the financial reporting system. It appears unlikely that the growing importance of intangibles or changes in business models is explaining the underperformance of value strategies. Indeed, as we will see in section 5 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.

4.4 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 in section 2) 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 in section 2. 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 prices will move inversely with movements in interest rates. But now 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 (i) short term risk-free rates (e.g., 3 month T-Bills) are high or low, or (ii) longer term risk-free rates (e.g., 10 year rates) are high or low, or (iii) the slope of the risk free curve is high or low? Furthermore, is it the level of these rates, or is the change in rates (either 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, as 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 affects are difficult to pre-specify. 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 in Asness, 2003, linking expected earnings growth rates to expected inflation changes and yields). The overall effect on stock prices is not clear as both the numerator and denominator move in the same direction. It gets further complicated if you consider 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 look 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. But that partial derivative is holding a lot of other things constant (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 Asness, Maloney and Moskowitz (2020). Long-short, industry-neutral value portfolios exhibit little sensitivity with the level of interest rates (either the level of 3-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 with 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). While 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 wouldn't it make sense to trade bonds directly if you had the skill to forecast changes in the shape of the yield curve? What looks like an appealing casual 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.

4.5 Systematic value strategies are too well known

A classic criticism of systematic approaches to value investing is that it seems implausible that investing on simple and well-known strategies, such as *B/P* or *E/P*, can systematically identify mispriced securities (e.g., Sloan, 2018). This criticism could be applied to most systematic investing approaches. Of course, this 'too well known' criticism seems to get far more airtime following periods of poor performance of a given systematic strategy. Asness (2015) discusses this point explicitly and notes 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 (like *B/P*) behave like a risk premium (e.g., distress risk in Fama and French, 1992; risk of assets in place in Berk, Green and Naik, 1999 and Zhang, 2005; investment related risks in Cooper, Gulen and Schill, 2008, and Gomes, Kogan and Zhang 2003; and q-theory as in 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 which an investor is compensated for holding. Second, part of the return can be attributable to errors in expectations of investors. 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 a 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.

While it is hard to assess who is actually on the other side of a value strategy, if it was 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, while there is variation in value spreads through time, and that variation aligns with variation in the performance of value returns, the ability to make predictive statements is challenging (see e.g., Asness, Friedman, Krail and Liew, 2000; 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 counter-factual evidence before throwing in the towel. A good example of this is 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 have 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 it goes all the way to zero runs the risk of missing useful strategies that have experienced a tough period. Indeed, for prominent factors (like value) the evidence supports out of sample (i.e., post-publication) evidence in many asset classes and geographies (see e.g., Table 3 in Ilmanen, Israel, Moskowitz, Thapar and Wang, 2019).

A related critique, implicit in our paper'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 over-extrapolation of past growth (Lakonishok, Shleifer and Vishny, 1994) and the over-reliance 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. While this mean reversion happens on average, it is not always the case, particularly in periods where stock prices respond less to fundamental news.

5. Do 'fundamentals' still matter for stock returns?

Value strategies have worked well across multiple asset classes, time period and geographies. However, for stocks the last decade has been tough, with value strategies facing significant headwinds, especially the last few years (see the evidence discussed in Section 3). We have assessed a variety of reasons for the recent under-performance. 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 under-performance is not unique to LC stocks nor 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. Yes, 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. But we found that measures designed to purge these distortions have also under-performed recently. We also showed that industry adjusting 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, but it is 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 under-performance 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 be explaining the under-performance of value strategies? Value strategies 'work' when the wedge between fundamental value and price converges. 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 below 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 labelled 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 at December 2018. The FEP* measure uses analyst forecasts of earnings for calendar year 2020 that are released as at December 201**9**. 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 Figure 8 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 Figure 8 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 it has waned at certain periods (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 universe together). We focus on the US sample as 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 $F_t = B_t + \frac{E[X_{t+12} - rB_t]}{1+r} + \frac{E[X_{t+24} - rB_{t+12}]}{[1+r]r}$. 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 (i) DIV (gross dividend return), (ii) ΔMULT (multiple expansion), and (iii) ΔFUND (fundamental news). This framework is like the approach in Richardson, Sloan and You (RSY, 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 RSY and find similar results. We prefer our method as it preserves a completely additive decomposition of log returns.

To start with 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 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 expectations of discount rates we hold r fixed for the growth period. The regression is run every month and we average regression coefficients across month in each calendar year.

Table 6 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 (1998 and 1999) and the last two years, where $\ln\left(\frac{F_t}{P_t}\right)$ is only weakly positively 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 visualise this temporal pattern we conduct a return variance decomposition in Figure 9. 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) explain about 30 percent of annual return variation, but during certain periods that exlanatory power can be much lower. Part of the under-performance 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 return predictability of $\ln\left(\frac{F_t}{P_t}\right)$. Using the identity described above we decompose log-returns over the next 12 months as follows: $\ln(R_{t,t+12}) = \ln\left(1 + \frac{D_{t+12}}{P_{t+12}}\right) + \ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right) + \ln\left(\frac{F_{t+12}}{F_t}\right)$, and then examine how $\ln\left(\frac{F_t}{P_t}\right)$ is associated with each return component. Table 7 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. The first two columns in Table 7 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 Table 6, the regression does provide a direct indication of the performance of value as we are not controlling for ex post cash flow news. The regression coefficient on $\ln\left(\frac{F_t}{P_t}\right)$ in Table 7 is generally positive, and the average coefficient over the 1987-2019 period is 0.02 (unreported Newey-West corrected Fama-Macbeth t-statistic of 1.27). Consistent with earlier results, however, there are distinct periods where value strategies have performed poorly (notably 1990, the latter part of the dot.com period, 2008 and the last two 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)[1].

[1] 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.

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) have 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) note for simple B/P strategies, the latter affect can dominate the former, challenging the success of simple value strategies. Notably, the periods of strongest under-performance of our broad value measure (1990, 1999, 2000, 2008, 2018 and 2019) are periods where 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 66 percent 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 17 percent lower than its full sample average. This general pattern is also evident in 1999, 2018 and 2019. When value under-performs the most, it is due to a combination of deterioration in fundamentals of cheap stocks (but not too much greater than normal) and a widening in the gap between prices and fundamentals (but considerably more so than average).

Consistent with the earlier results, fundamentals *do* matter for stock returns, but there are periods where stock prices become less connected with fundamental information, and in such periods value strategies under-perform. 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 if 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 analysed in this paper, are typically not utilized on a stand-alone basis. Investors tend to incorporate value measures with other well-known strategies (e.g., momentum and quality/defensive). Given that (i) each of these investment themes work well individually, and (ii) each of the themes are lowly, or negatively correlated (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. The focus in this paper has been to assess criticism levelled at value strategies on a stand-alone basis. While we have found these criticisms generally lacking in merit, none of those criticism challenged the powerful diversification potential of combining measures of value with momentum, defensive and other investment themes.

6. Conclusion

Despite the extensive prior research supporting value strategies (across asset classes, across time periods, and across 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, ranging from (i) increased share repurchase activity, (ii) the changing nature of firm activities, the rise of 'intangibles' and the impact of conservative accounting systems, (iii) the changing nature of monetary policy and the potential impact of lower interest rates, and (iv) value measures are too simple to work. Across each criticism 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.

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Table 1: Descriptive statistics

Panel A: Large Capitalization (LC) sample

CTRY	# Firms	# Firm-months	# sectors	Avg. Firm MCAP	Avg. MKT MCAP	Start	End
AUS	55	17,174	7	10.6	632.7	1993	2019
CAN	82	29,405	9	9.2	835.1	1990	2019
FRA	72	25,906	9	15.7	1,165.2	1990	2019
GER	58	20,661	8	16.3	914.4	1990	2019
HKG	28	9,939	5	12.4	387.5	1990	2019
ITA	40	14,214	6	10.2	408.7	1990	2019
JPN	323	128,024	10	8.8	2,812.6	1986	2019
NET	27	9,566	7	14.4	377.3	1990	2019
SIN	18	6,284	4	8.2	158.4	1990	2019
SPA	30	10,637	6	11.7	364.2	1990	2019
SWE	31	10,973	6	8.9	293.6	1990	2019
SWI	33	11,246	6	18.5	685.2	1990	2019
UKI	166	59,593	10	13.6	2,178.3	1990	2019
USA	997	429,833	10	10.7	11,368.0	1984	2019
BRA	46	13,845	8	8.5	439.0	1994	2019
CHN	90	20,469	9	17.2	1,985.1	2000	2019
KOR	90	27,223	9	5.5	513.9	1994	2019
MAL	33	9,178	7	5.7	147.0	1994	2019
MEX	21	6,212	5	8.6	162.6	1994	2019
SAF	41	11,982	7	5.5	226.5	1995	2019
TAI	85	23,246	7	4.8	409.4	1997	2019

Panel A: Small Capitalization (SC) sample

CTRY	# Firms	# Firm-months	# sectors	Avg. Firm MCAP	Avg. MKT MCAP	Start	End
AUS	66	14,903	8	1.1	77.0	2001	2019
CAN	93	21,158	9	1.2	122.1	2001	2019
FIN	20	5,468	4	1.1	18.6	1997	2019
FRA	68	18,686	8	1.1	63.5	1997	2019
GER	71	19,621	7	1.0	63.8	1997	2019
HKG	42	11,605	6	1.0	42.8	1997	2019
ITA	53	14,486	7	1.0	52.1	1997	2019
JPN	674	185,315	9	0.7	452.0	1997	2019
NET	24	6,697	5	1.0	21.0	1997	2019
NOR	27	6,734	5	0.9	25.0	1997	2019
SIN	23	6,459	5	0.8	19.2	1997	2019
SWE	44	9,164	7	1.1	47.0	2002	2019
SWI	48	10,126	6	1.2	56.9	2002	2019
UKI	180	49,628	9	1.0	170.3	1997	2019
USA	1445	622,973	10	0.6	836.8	1984	2019
BRA	38	9,995	6	0.7	34.1	1997	2019
CHN	142	36,860	8	0.7	127.7	1998	2019
IDN	22	5,939	5	0.6	15.4	1997	2019
IND	129	34,444	9	0.7	104.1	1997	2019
KOR	226	60,460	9	0.4	105.9	1997	2019
MAL	50	12,874	7	0.5	23.0	1997	2019
SAF	36	9,475	6	0.7	27.7	1997	2019
TAI	259	69,171	7	0.4	100.3	1997	2019
THA	43	11,451	8	0.5	26.7	1997	2019
TUR	39	8,103	6	0.5	20.8	2001	2019

Table 2: Simple value portfolios

This table reports equal weighted (EW) and value weighted (VW) average returns for quintile portfolios formed for each of five value measures (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1). Each month we sort US large capitalization (LC) and small capitalization (SC) firms into five equal sized groups. This sort is conducted independently for each of the five value measures. Q1 (Q5) contains securities with the lowest (highest) value scores, so Q1 (Q5) is rich (cheap). We compute the time series average of these quintile portfolio returns. We also compute a dollar neutral long Q5/short Q1 portfolio (labelled Q5-Q1) and we report a test-statistic based on the time series variation in those returns. The test-statistic is reported in parentheses below Q5-Q1 returns.

Panel A: LC EW returns

Measure	Q1 (LOW)	Q2	Q3	Q4	Q5 (HIGH)	Q5 – Q1
B/P	12.2%	11.5%	12.0%	13.9%	14.7%	2.4%
						(0.9)
E/P	11.4%	11.7%	12.4%	13.2%	15.6%	4.2%
						(1.7)
FEP	11.0%	12.0%	12.5%	13.9%	15.3%	4.3%
						(1.4)
S/EV	9.6%	12.1%	12.9%	13.9%	15.7%	6.1%
						(2.4)
CF/EV	9.1%	11.5%	12.9%	14.4%	16.5%	7.4%
						(2.8)

Panel B: LC VW returns

Measure	Q1 (LOW)	Q2	Q3	Q4	Q5 (HIGH)	Q5 – Q1
B/P	12.0%	11.5%	11.6%	12.5%	12.3%	0.3%
						(0.1)
E/P	10.6%	11.1%	11.1%	12.3%	14.6%	4.0%
						(1.5)
FEP	10.6%	10.8%	11.0%	13.2%	14.0%	3.3%
						(1.3)
S/EV	10.7%	11.2%	12.2%	12.7%	13.9%	3.2%
						(1.5)
CF/EV	9.7%	10.2%	12.6%	13.0%	14.4%	4.6%
						(1.8)

Panel C: SC EW returns

Measure	Q1 (LOW)	Q2	Q3	Q4	Q5 (HIGH)	Q5 – Q1
B/P	9.1%	9.1%	10.2%	12.9%	11.8%	2.7%
						(0.9)
E/P	6.9%	9.2%	11.2%	12.4%	13.9%	7.0%
						(2.2)
FEP	8.0%	10.7%	11.2%	13.5%	14.5%	6.4%
						(1.7)
S/EV	4.6%	10.6%	10.1%	12.6%	15.3%	10.6%
						(3.6)
CF/EV	4.7%	8.1%	12.1%	13.5%	14.2%	9.5%
						(2.9)

Panel D: SC VW returns

Measure	Q1 (LOW)	Q2	Q3	Q4	Q5 (HIGH)	Q5 – Q1
B/P	10.8%	9.7%	10.9%	13.1%	12.2%	1.4%
						(0.4)
E/P	8.0%	9.8%	10.3%	12.5%	14.6%	6.5%
						(2.1)
FEP	9.4%	9.4%	10.6%	13.0%	14.6%	5.2%
						(1.4)
S/EV	7.1%	11.4%	10.8%	12.9%	14.7%	7.5%
						(2.4)
CF/EV	6.2%	8.4%	11.9%	13.4%	14.4%	8.3%
						(2.4)

Table 3: Performance of value strategies across regions and capitalization groupings

In this table we show the Sharpe Ratio of five value portfolios (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1) and an equally risk weighted combination (VAL) separately for our LC and SC universes. Within each market capitalization grouping we reports results separately for developed and emerging markets splitting out the US as a separate country within the set of developed countries. For each country-capitalization-sector grouping we adjust each valuation ratio by subtracting the median of the respective sector (GICS level 2) group. We then rank and standardize within each country. Portfolios are formed within each country where portfolio weights are directly proportional to the rank-standardized score. Portfolios are dollar-neutral within each country. We aggregate across countries to form regional portfolios by weighting each country by the square-root of number of companies in each country.

	SC			**LC**		
	USA	**Developed ex USA**	**Emerging**	**USA**	**Developed ex USA**	**Emerging**
B/P	0.30	0.42	0.79	0.28	0.54	0.34
(t-stat)	*(1.8)*	*(2.0)*	*(3.7)*	*(1.7)*	*(3.1)*	*(1.7)*
E/P	0.45	0.77	0.74	0.39	0.46	0.83
(t-stat)	*(2.7)*	*(3.7)*	*(3.5)*	*(2.3)*	*(2.6)*	*(4.2)*
FEP	0.37	0.59	0.40	0.29	0.37	0.72
(t-stat)	*(2.2)*	*(2.8)*	*(1.9)*	*(1.7)*	*(2.1)*	*(3.6)*
S/EV	0.79	0.76	1.41	0.43	0.60	0.51
(t-stat)	*(4.7)*	*(3.7)*	*(6.7)*	*(2.6)*	*(3.4)*	*(2.6)*
CF/EV	0.82	1.42	1.38	0.80	0.33	0.94
(t-stat)	*(4.9)*	*(6.8)*	*(6.5)*	*(4.8)*	*(1.7)*	*(4.6)*
VAL	0.75	0.96	1.48	0.51	0.61	0.95
(t-stat)	*(4.5)*	*(4.6)*	*(7.0)*	*(3.1)*	*(3.5)*	*(4.8)*

Table 4: Impact of portfolio construction choice (peer) for value strategies

This table reports the Sharpe Ratios of the value strategy composite (VAL) which is an equally risk weighted combination of the B/P, E/P, FEP, S/EV, and CF/EV portfolios (each measure is described in section 3.1). The first set of portfolios labelled 'None' for Peer Group are formed by ranking and standardizing all firms within each country. The second set of portfolios labelled 'Sector' for Peer Group are formed by first adjusting each value measure by subtracting the median within the respective country-sector (GICS level 2) group, and then rank and standardize all firms within each country. The third portfolio labelled 'Industry' for Peer Group are formed by first adjusting each value measure by subtracting the median within the respective country-industry (GICS level 4) group, and then rank and standardize all firms within each country. All portfolios are dollar-neutral within each country with portfolio weights directly proportional to the rank-standardized score. We aggregate across countries to form regional portfolios by weighting each country by the square-root of number of companies in each country.

		SC			**LC**		
	Peer Group	USA	Developed ex USA	Emerging	USA	Developed ex USA	Emerging
SR	None	0.44	0.74	1.46	0.36	0.48	0.89
(t-stat)		*(2.7)*	*(3.6)*	*(6.9)*	*(2.1)*	*(2.7)*	*(4.5)*
SR	Sector	0.75	0.96	1.48	0.51	0.61	0.95
(t-stat)		*(4.5)*	*(4.6)*	*(7.0)*	*(3.1)*	*(3.5)*	*(4.8)*
SR	Industry	0.89	1.07	1.40	0.58	0.82	0.98
(t-stat)		*(5.3)*	*(5.1)*	*(6.6)*	*(3.5)*	*(4.7)*	*(4.9)*

Table 5: Value portfolio Sharpe ratios linked to share repurchase activity

In this table we show the Sharpe Ratio of five Value portfolios (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1) and an equally risk weighted combination (VAL) separately for our LC and SC universes for separate universes based on share repurchase intensity. This analysis is limited to the US as this is where the vast majority of share repurchase activity occurs. US firms are split into three groups separately for large capitalization (LC) and small capitalization (SC) categories as follows : (i) firms with no share repurchase activity over the last 12 months, (ii) 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 (iii) 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.

	USA SC			**USA LC**		
	ZERO	**LOW**	**HIGH**	**ZERO**	**LOW**	**HIGH**
% of sample	58%	21%	21%	36%	32%	32%
MCAP Percentile	0.27	0.33	0.31	0.77	0.81	0.82
% B<0	4.2%	2.1%	2.1%	2.4%	1.3%	2.1%
B/P	0.30	0.30	0.05	0.28	0.11	0.22
(t-stat)	*(1.8)*	*(1.8)*	*(0.3)*	*(1.7)*	*(0.6)*	*(1.3)*
E/P	0.44	0.18	0.24	0.21	0.09	0.39
(t-stat)	*(2.6)*	*(1.1)*	*(1.5)*	*(1.3)*	*(0.6)*	*(2.4)*
FEP	0.37	0.37	0.26	0.12	0.06	0.36
(t-stat)	*(2.2)*	*(2.2)*	*(1.6)*	*(0.7)*	*(0.4)*	*(2.2)*
S/EV	0.82	0.45	0.48	0.29	0.13	0.38
(t-stat)	*(4.9)*	*(2.7)*	*(2.9)*	*(1.7)*	*(0.8)*	*(2.3)*
CF/EV	0.77	0.64	0.59	0.55	0.50	0.79
(t-stat)	*(4.6)*	*(3.8)*	*(3.5)*	*(3.3)*	*(3)*	*(4.7)*
VAL	0.78	0.54	0.47	0.37	0.21	0.51
(t-stat)	*(4.7)*	*(3.2)*	*(2.8)*	*(2.2)*	*(1.3)*	*(3.1)*

Table 6: Importance of fundamentals

In this table we report averages of monthly 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, *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 month in each calendar year.

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**

Table 7: Components of return predictability for value measures

This table reports calendar year averages of monthly cross-sectional regressions. Each month we run the following regression: $\ln(R_{t,t+12}) = a + b.\ln\left(\frac{F_t}{P_t}\right) + \varepsilon$. $\ln\left(\frac{F_t}{P_t}\right)$ 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 follows, $\ln(R_{t,t+12}) = \ln\left(1 + \frac{D_{t+12}}{P_{t+12}}\right) + \ln\left(\frac{P_{t+12}/F_{t+12}}{P_t/F_t}\right) + \ln\left(\frac{F_{t+12}}{F_t}\right)$, and examine the predictive ability of $\ln\left(\frac{F_t}{P_t}\right)$ across the three components. T-statistics are italicized and reported to the right of regression coefficients.

	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	*8.0*	-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	*5.2*	0.16	*7.0*	-0.15	*-6.3*
2017	0.03	*2.2*	0.01	*5.1*	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*

Figure 1: Starbucks Corporation (SBUX)

This figure 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: (i) current share price ($87.92), (ii) assumed discount rate of 4.4% (based on U.S. ten year yield of 1.91%, rolling three year beta of 0.82 for SBUX, and an assumed 3% equity risk premium, (iii) current book value per share of -$5.26, (iv) consensus earnings forecasts of $3.04 for fiscal 2020 and $3.42 for fiscal 2021, and (v) consensus net dividend forecasts of $3.71 for fiscal 2020 and $3.89 for fiscal 2021. The decomposition is described in section 2.

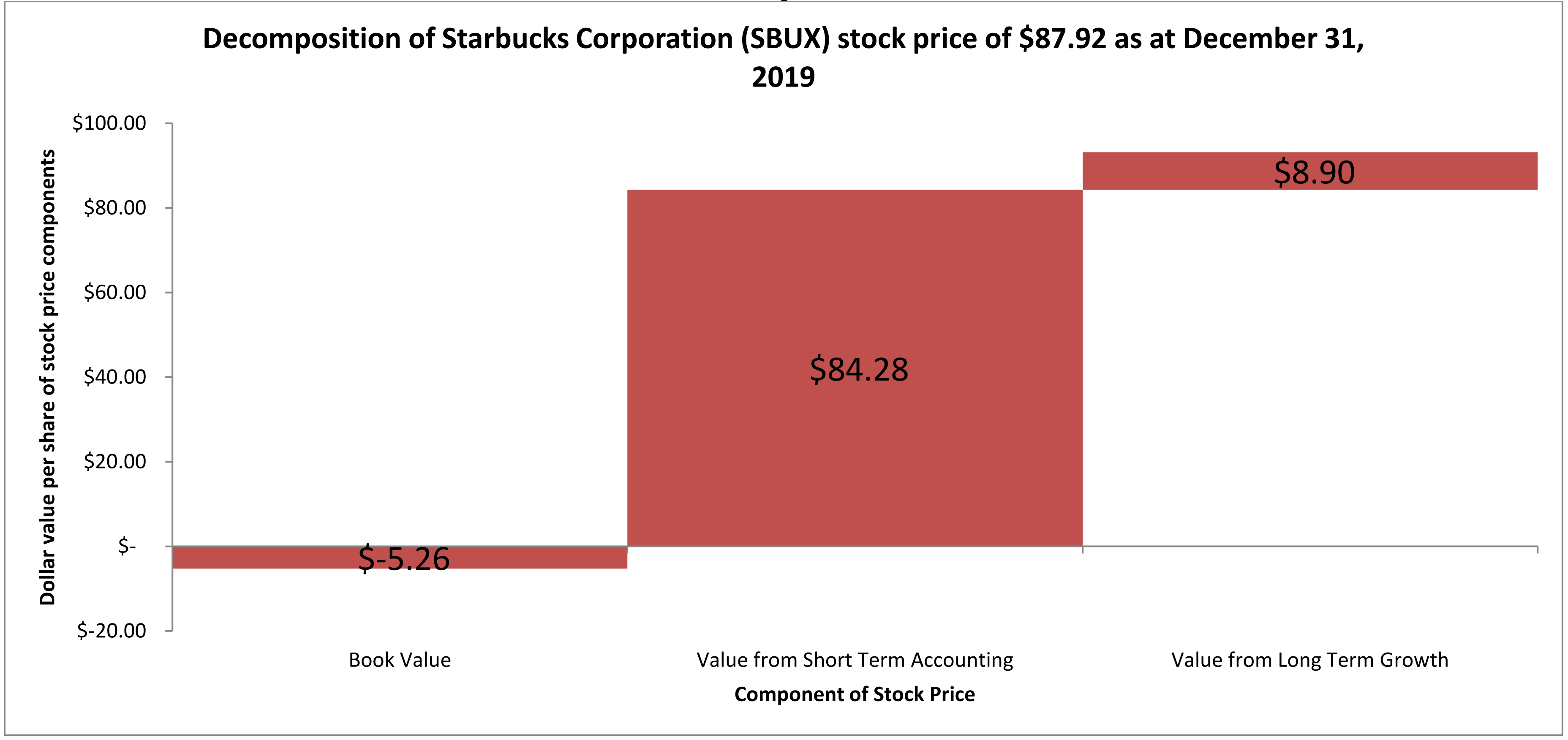


Figure 2: Chipotle Mexican Grill (CMG)

This figure 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: (i) current share price ($837.11), (ii) assumed discount rate of 4.5% (based on U.S. ten year yield of 1.91%, rolling three year beta of 0.85 for CMG, and an assumed 3% equity risk premium, (iii) current book value per share of $52.04, (iv) consensus earnings forecasts of $13.90 for fiscal 2019 and $17.84 for fiscal 2020, and (v) consensus net dividend forecasts of $6.87 for fiscal 2019 and $8.12 for fiscal 2020. The decomposition is described in section 2.

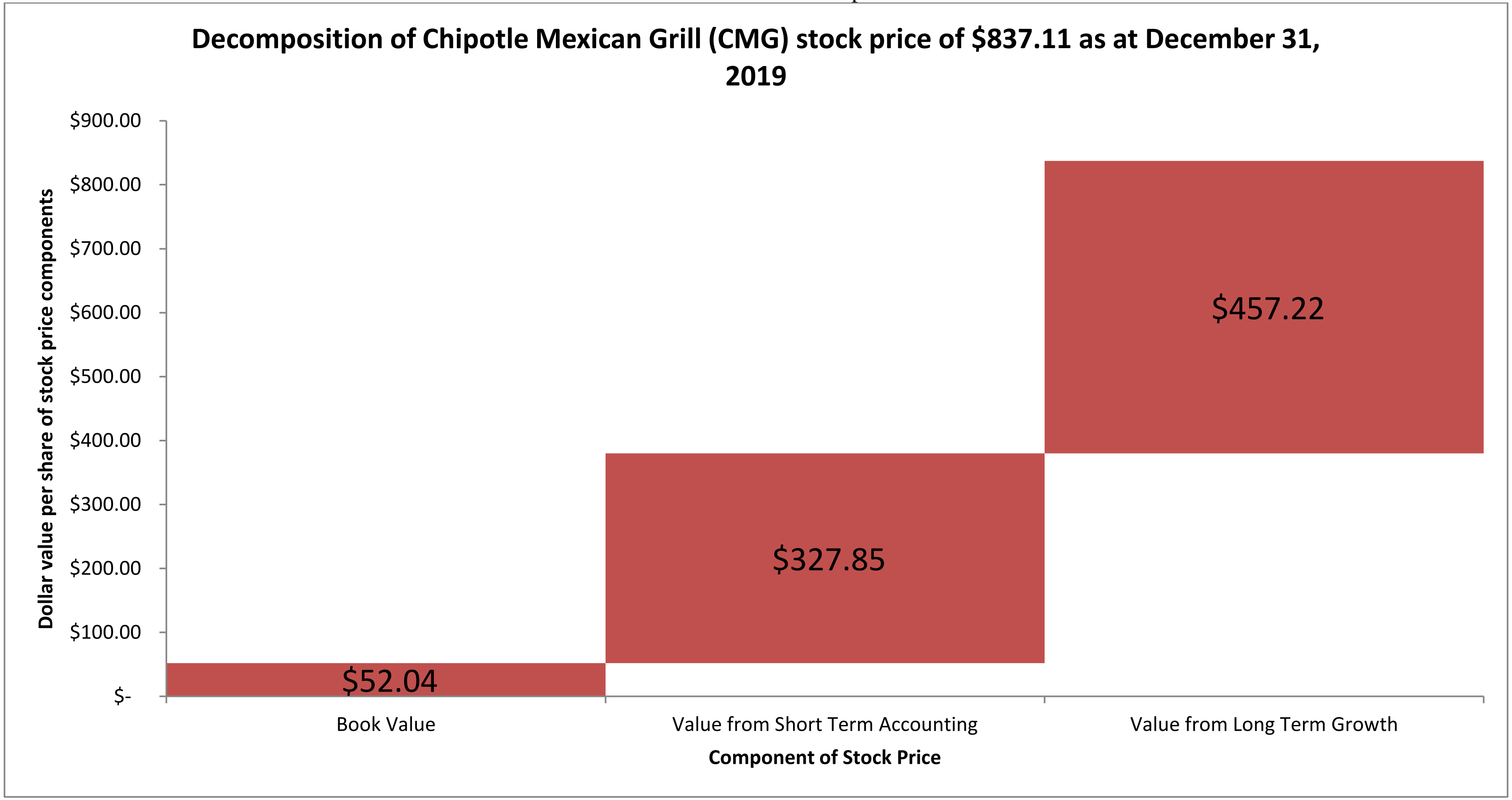
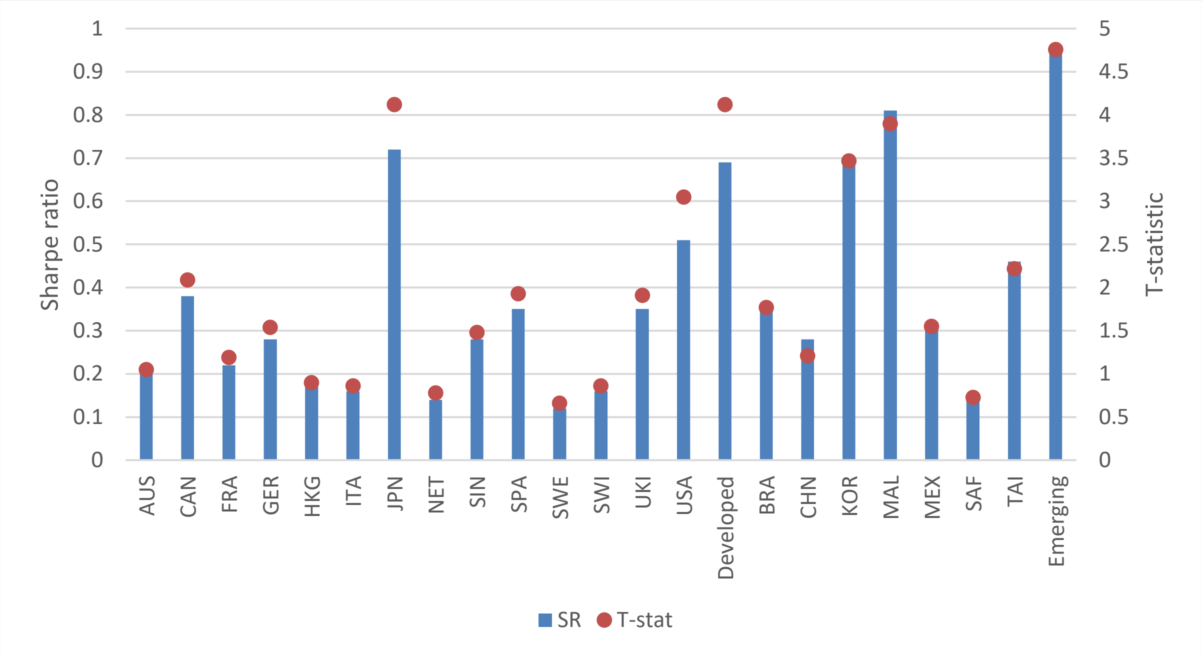


Figure 3: This figure reports the Sharpe ratio of the value strategy combination for each country in our large and small capitalization universes. The sample period starts between 1984 and 2002, depending on the country, and ends in 2019, see Table 1. We start with five measures of value (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1). We form an equally risk weighted combination (VAL) across these five measures separately for our SC and LC universes. For each value metric we adjust each valuation ratio by subtracting the median of the respective country-sector (GICS level 2) group. We then rank and standardize within each country. Portfolios are formed within each country where portfolio weights are directly proportional to the rank-standardized score. Portfolios are dollar-neutral within each country. We aggregate across countries to form regional (developed and emerging) portfolios by weighting each country by the square-root of number of companies in each country.

Panel A: LC



Panel B: SC

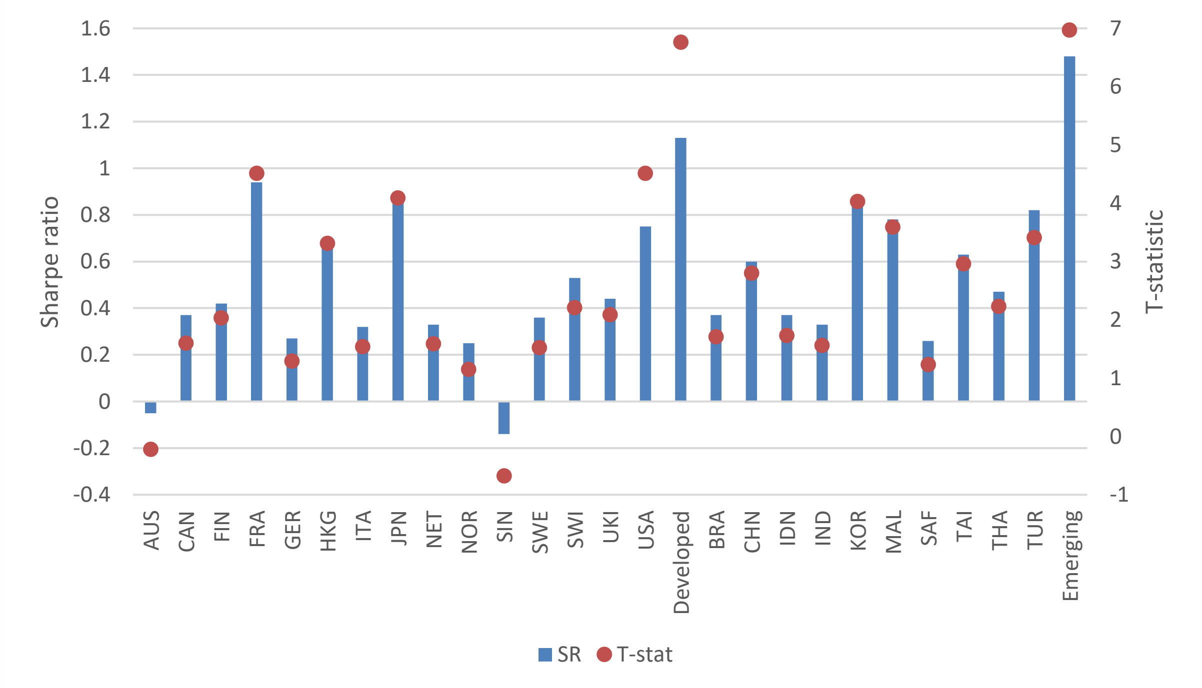


Figure 4: This figure reports cumulative returns for the combined value strategy for each region-capitalization universe. Using five measures of value (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1), we form an equally risk weighted combination (VAL) across these five measures separately for each region (US, developed-ex-US and emerging) and capitalization grouping (large and small). For each value metric we first adjust the valuation ratio by subtracting the median of the respective country-sector (GICS level 2) group. We then rank and standardize within each country. Portfolios are formed within each country where portfolio weights are directly proportional to the rank-standardized score. Portfolios are dollar-neutral within each country. We aggregate across countries to form regional (developed and emerging) portfolios by weighting each country by the square-root of number of companies in each country.

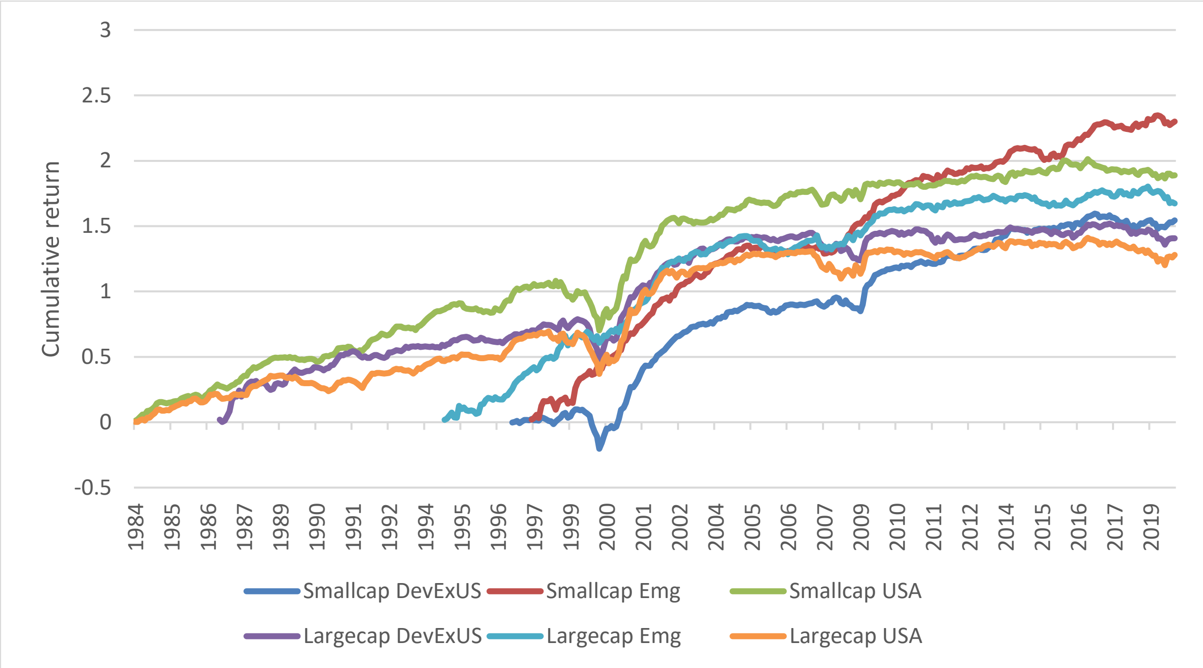


Figure 5: This figure shows the 2-year rolling Sharpe ratios for the combined value strategy for each region-capitalization universe. Using five measures of value (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1), we form an equally risk weighted combination (VAL) across these five measures separately for each region (US, developed-ex-US and emerging) and capitalization grouping (large and small). For each value metric we first adjust the valuation ratio by subtracting the median of the respective country-sector (GICS level 2) group. We then rank and standardize within each country. Portfolios are formed within each country where portfolio weights are directly proportional to the rank-standardized score. Portfolios are dollar-neutral within each country. We aggregate across countries to form regional (developed and emerging) portfolios by weighting each country by the square-root of number of companies in each country.

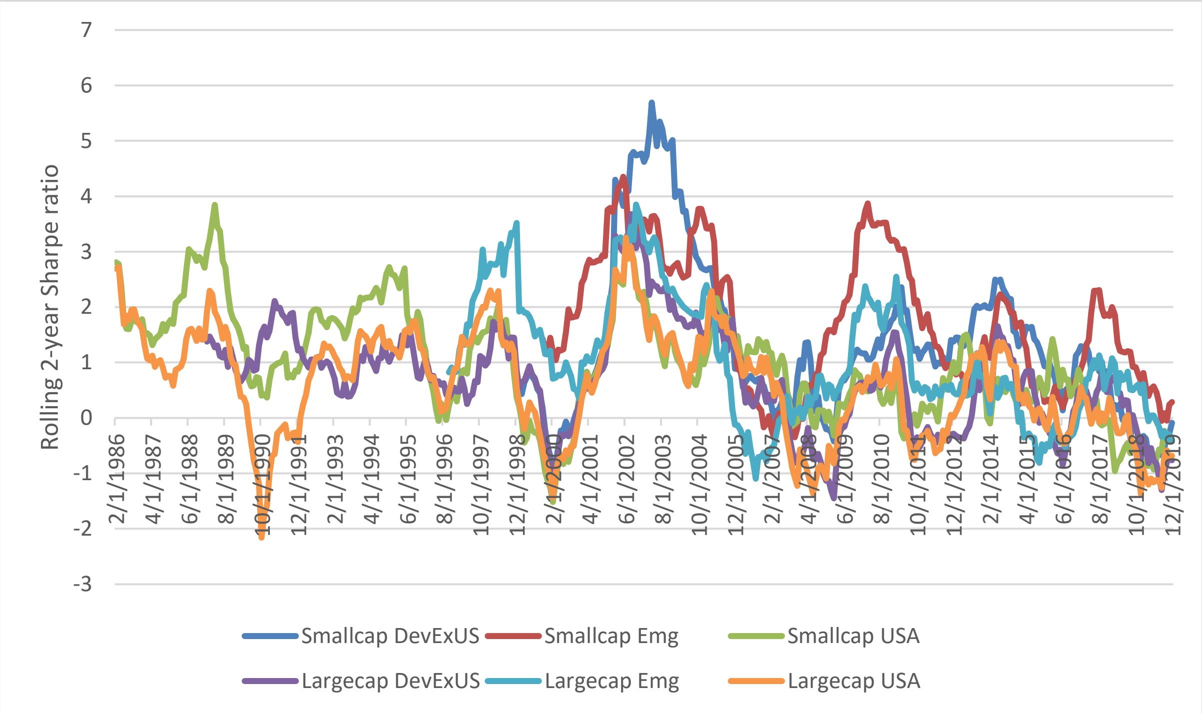
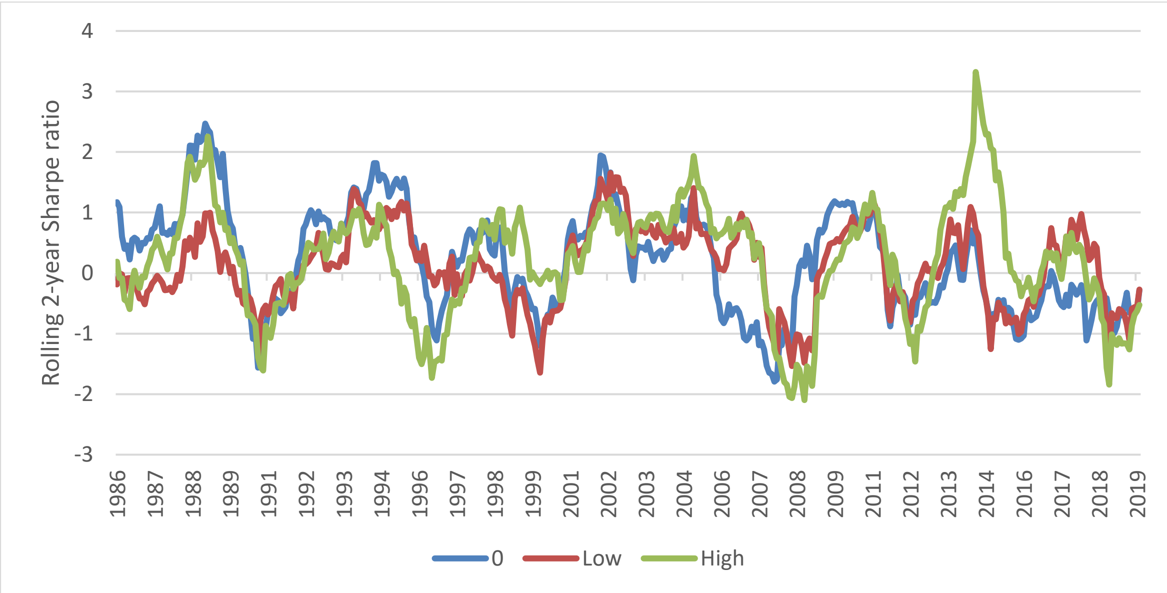


Figure 6: This figure shows the 2-year rolling Sharpe ratios for the B/P value strategy for the US across 3 sub-samples based on share repurchase intensity. US firms are split into three groups separately for large capitalization (LC) and small capitalization (SC) categories as follows : (i) firms with no share repurchase activity over the last 12 months (labelled '0'), (ii) 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 (labelled 'Low'), and (iii) 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 (labelled 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.

Panel A: LC



Panel B: SC

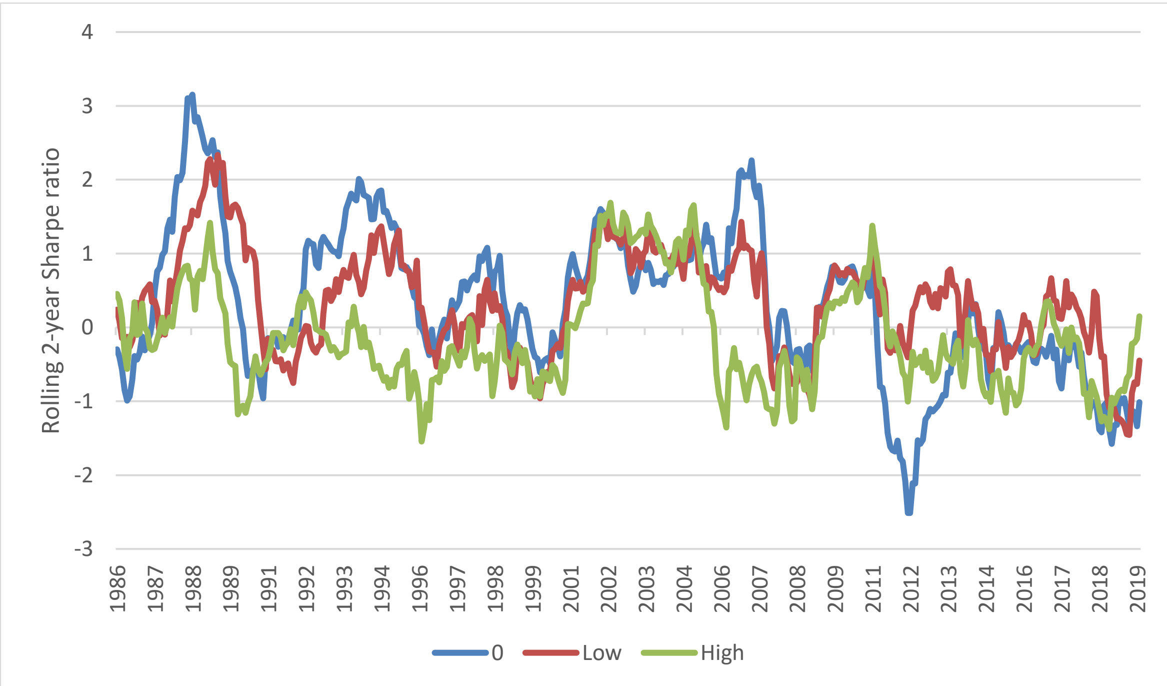
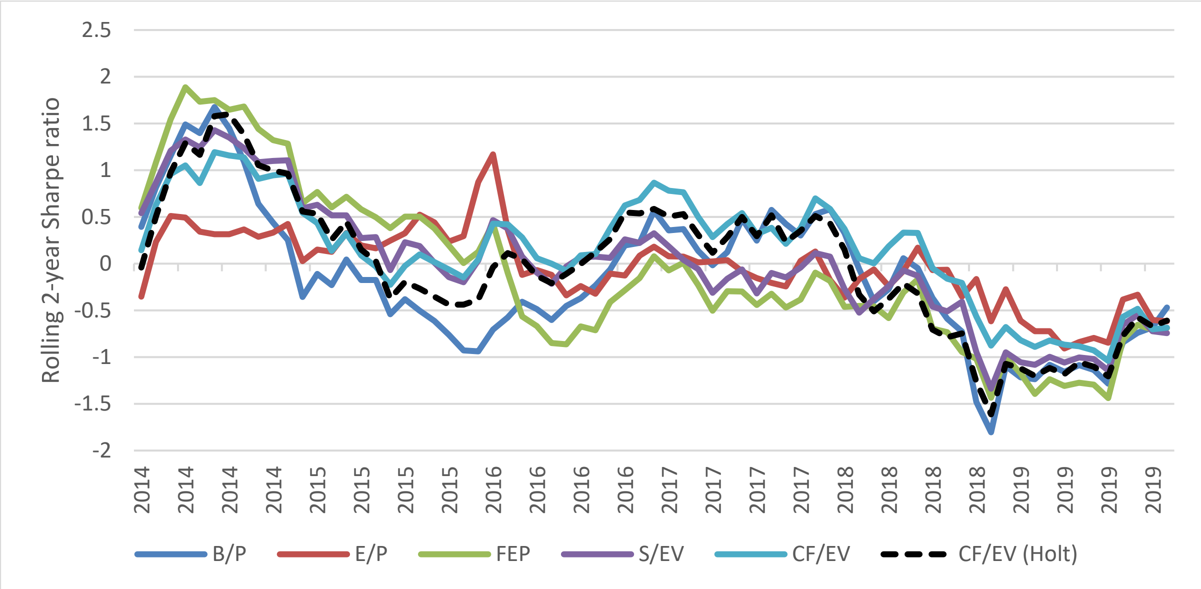


Figure 7: This figure shows the 2-year rolling Sharpe ratios for the individual value strategies (B/P, E/P, FEP, S/EV, CF/EV as described in section 3.1) within the large capitalization (LC) and small capitalization (SC) universe for US stocks. We introduce a 6th value measure, CF_{HOLT}/EV_{HOLT}, which 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 6 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.

Panel A: LC



Panel B: SC

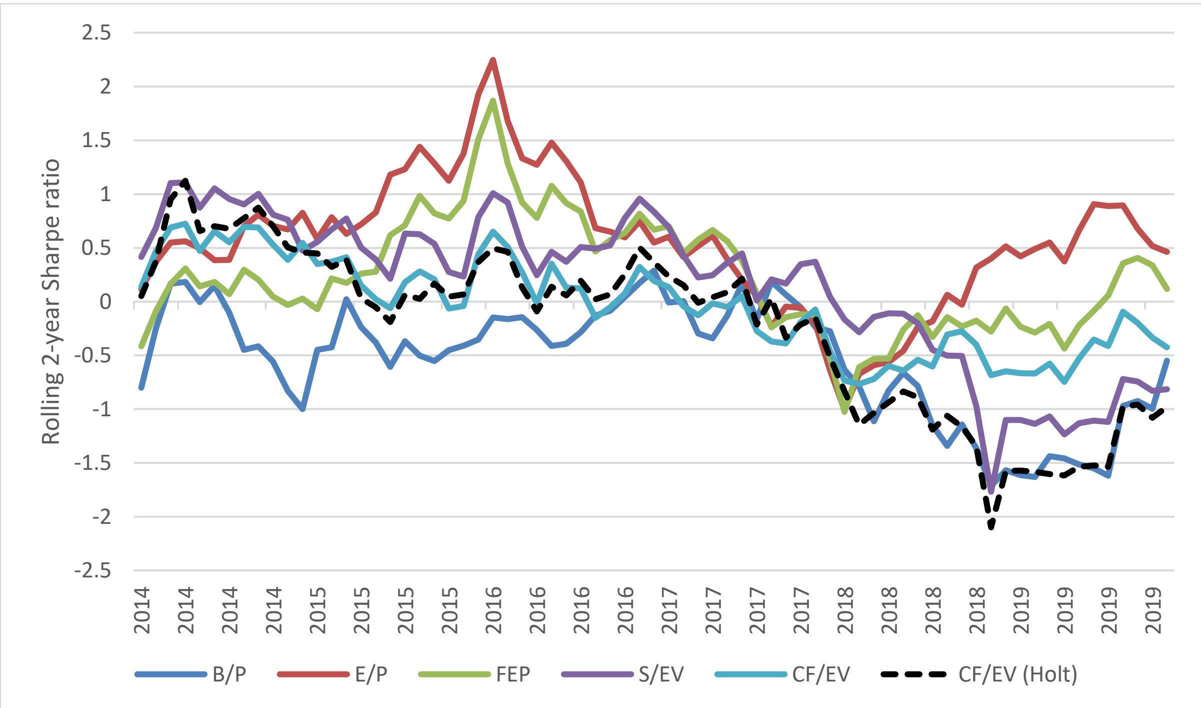
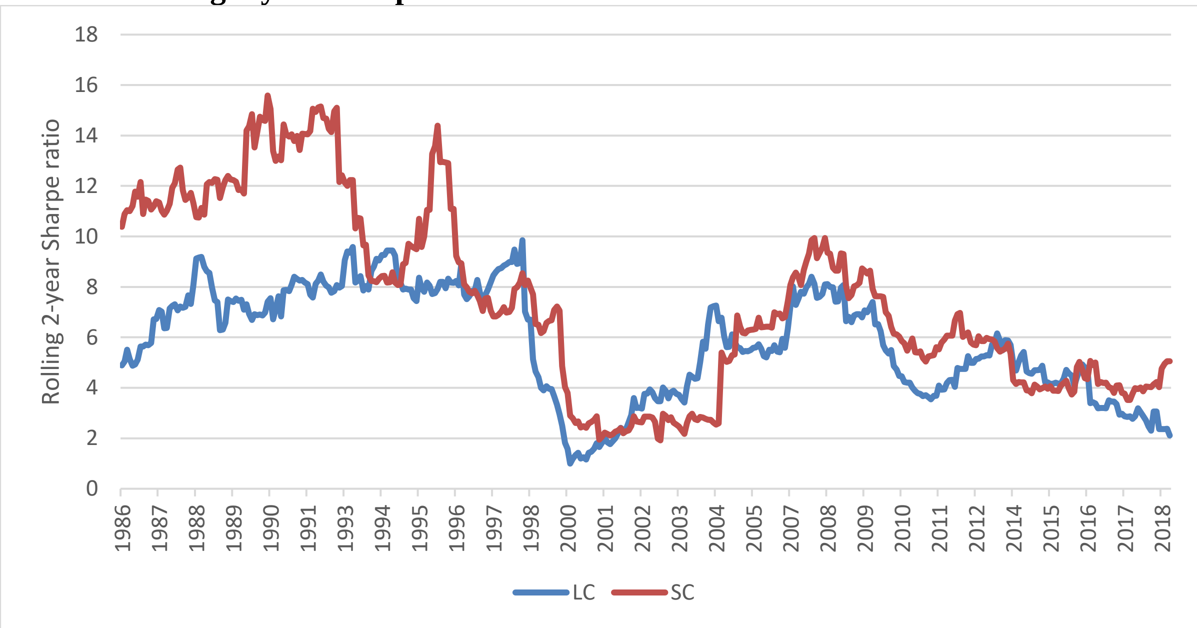


Figure 8: This figure reportes the performance of 'perfect foresight' earnings based value strategies. Panel A reportes rolling 2-year Sharpe ratios. Panel B reports cumuative returns. Our perfect foresight strategy, FEP*, uses the 12 month earnings expectations from sell-side analysts one year forward. 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 cumualtive returns for FEP in panel B. The FEP* portfolio is constructed by demeaning the raw within the respective market capitalization group, and then ranking and standardizing within sector.

Panel A: Rolling 2-year Sharpe ratio



Panel B: Cumulative returns

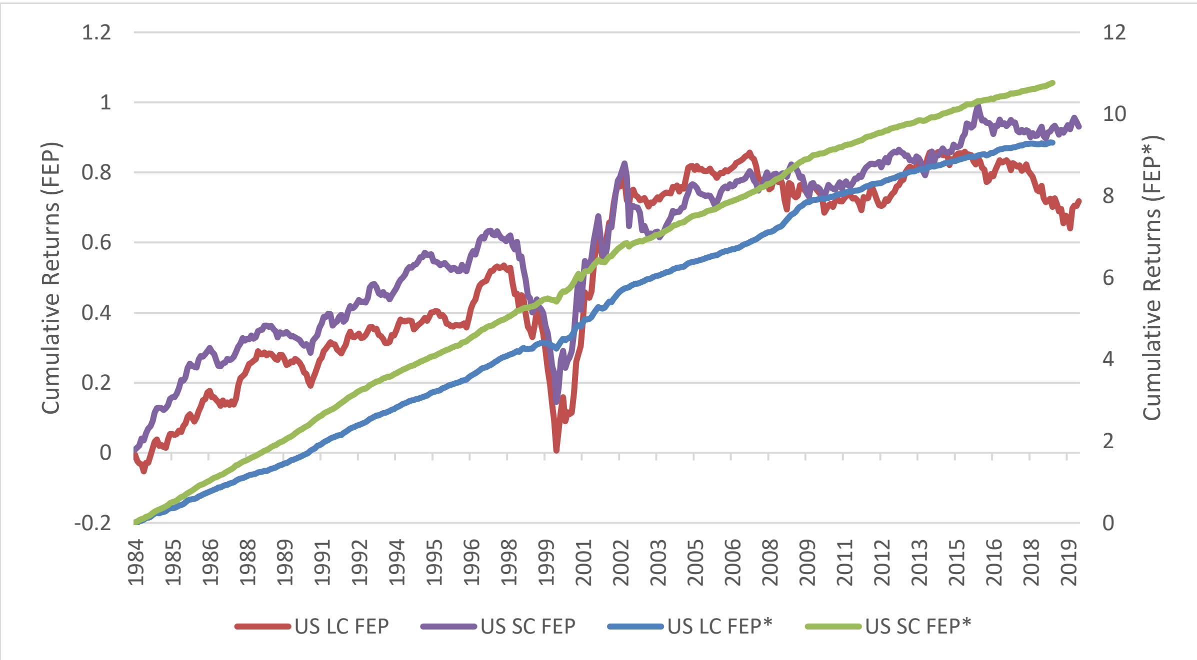


Figure 9: This figure shows the relative variance decomposition from a cross-sectional regression of future 12-month ahead log returns, $\ln(R_{t,t+12}) = \ln\left(\frac{P_{t+12}+D_{t+12}}{P_t}\right)$, onto two broad fundamental based measures. First, we include a lagged valuation multiple, $\ln\left(\frac{F_t}{P_t}\right)$, 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 efffects included for each capitalization category.