BUCKINGHAM
STRATEGIC WEALTH

R.I.P. Book Value?

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Our Investment Policy Research articles provide an in-depth look at due diligence that has been completed by the investment policy committee (IPC). We hope you find these articles to be educational and that they offer insight into the policies formed by our IPC.

If you're familiar with factor investing, you're likely aware that value investing, particularly in the U.S. market, has had a challenging stretch over the last 10 years. If you dig deeper into the darker recesses of factor investing nerdery, you'll also find that the validity of book value — one of the traditional measures of quantitative value — as a measure of a company's intrinsic value is under assault. The basic claim is that intangible assets (research and development expenses, brand name, intellectual capital, etc.) have become such a large fraction of intrinsic value for many companies that book value, which doesn't generally account for intangible assets, is being rendered useless.

Another claim is that book value is being distorted by the prevalence of share buybacks, which can potentially increase the stock price/book value measure beyond what it otherwise would be or even push book value into negative territory. Following the logic, continuing to use price/book value to sort companies into value and growth categories is then categorizing some companies that are truly value companies into growth companies and vice versa, as well as potentially discarding companies altogether if book value is negative. Presumably, again continuing with the logic, investors and their fund managers should either discard book value or replace it with other measures like earnings, cash flow and sales. Admittedly, many of the articles about book value are logically convincing, and many of the points made, as we will see below, are no doubt indisputable. Furthermore, I personally think it's fine to use other measures of value (e.g., price/earnings, price/sales, price/cash flow, etc.) in lieu of or as supplements to book value. So what's my beef?

My beef is that many of these articles are lean on any tangible, returns-based evidence that other measures of value are now clearly superior — or becoming superior — to price/book. In other words, all accounting measures are by definition flawed (e.g., the price/cash flow measure can be negative, earnings can be manipulated, cash-flow-based measures can generate higher portfolio turnover, etc.), and it would be a weird result if one measure were either clearly superior or inferior to all others, particularly when stock price is included in each measure. So let's examine the evidence, starting with the trend toward more negative book value companies.

THE TREND TOWARD NEGATIVE BOOK VALUE

Using Professor Ken French's data library, Figure 1 plots the historical percentage of companies with negative book value, while Figure 2 plots the historical percentage of market capitalization represented by negative book value companies.

Figure 1: Percentage of U.S. Companies with Negative Book Value
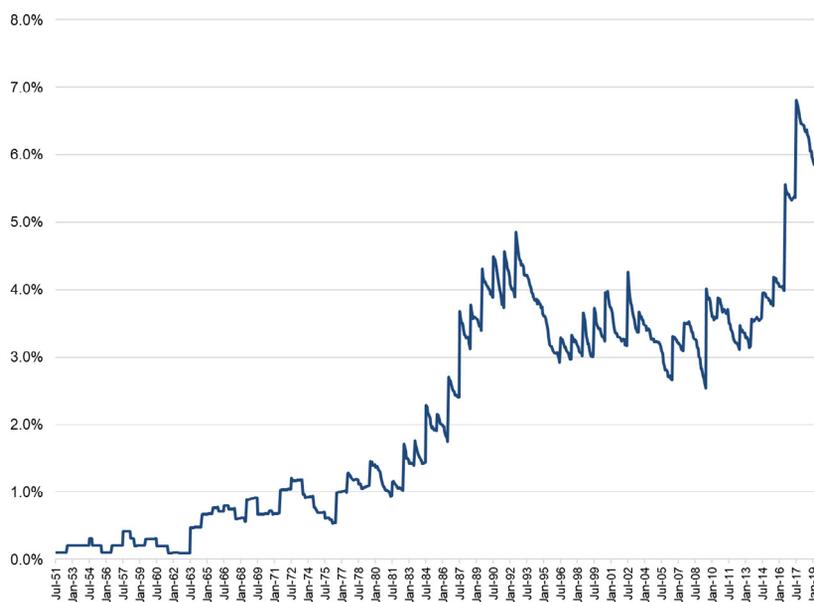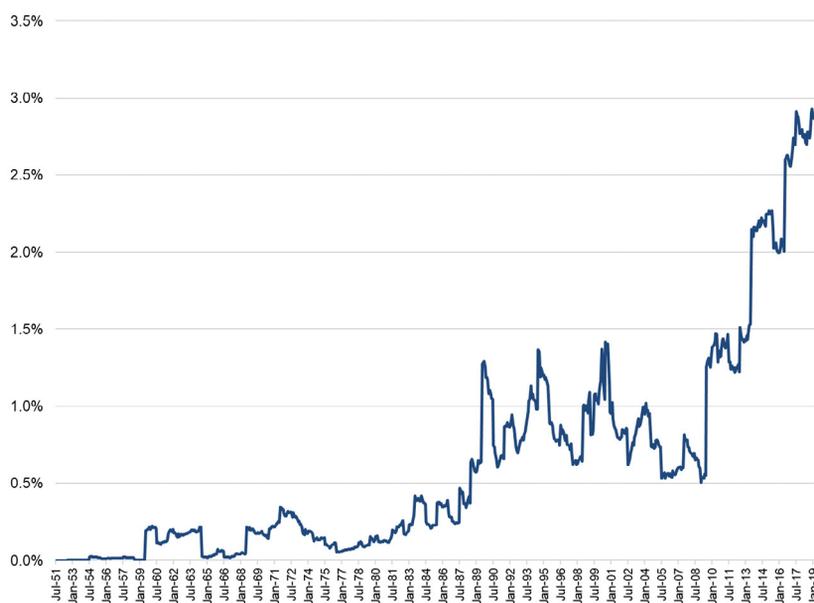

Figure 2: Percentage of U.S. Market Capitalization with Negative Book Value

We see that whether we measure the percentage by companies or by market capitalization, it's increasing. Starting around 2013, both measures started moving upward and through early 2019 are at levels higher than at any other point in history. Roughly 6 percent of companies have negative book values, and about 3 percent of market capitalization is represented by negative book value companies. Whether the trajectory will continue or reverse is not known, but it is true that negative book value is meaningfully more prevalent today.

At first glance, graphics like Figures 1 and 2 seem to raise significant questions about book value, and no doubt fund companies that primarily use book value, like Dimensional Fund Advisors, will need to continue to think about how such companies are handled, particularly if this is the new normal or if these percentages continue to increase. However, what about other metrics like earnings, cash flow or dividends? What percentage of firms (or market capitalization) is represented by firms with either negative earnings or cash flow or no dividends? Figures 3 and 4 plot the percentage of firms and percentage of market capitalization, respectively, associated with firms with negative earnings, negative cash flow or no dividend payments while retaining the negative book value line plot.

Figure 3: Percentage of U.S. Companies with Negative Book Value, Earnings or Cash Flow or No Dividends
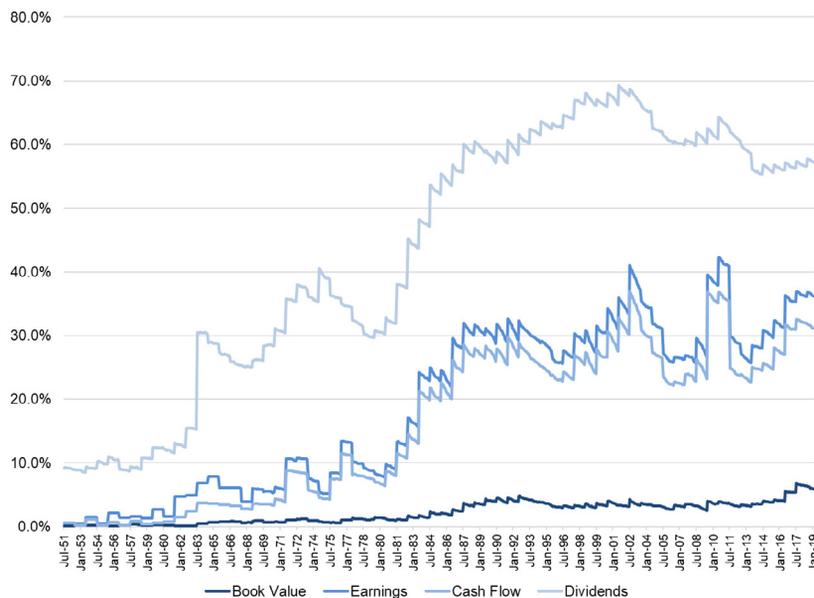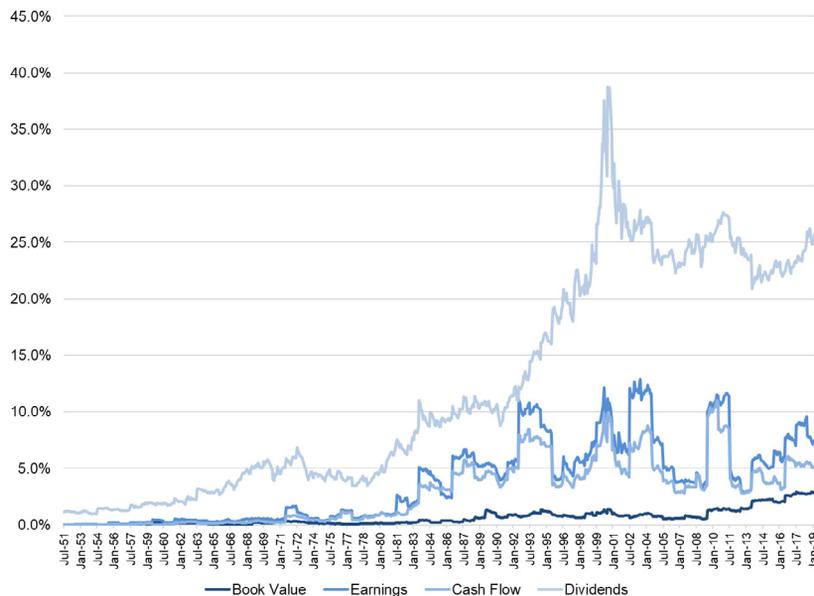

Figure 4: Percentage of U.S. Market Capitalization with Negative Book Value, Earnings or Cash Flow or No Dividends

In all other cases we see that both the percentage of companies and percentage of market capitalization with unusable values (i.e., negative earnings, negative cash flow or no dividends) are higher. In other words, for this particular critique of book value, even more challenges are presented by other metrics that could be used. Based upon Figures 3 and 4, are we to believe that somehow book value is a more problematic metric than the other three? That claim seems dubious.

VALUE COMPANIES IN DISGUISE?

Another critique of book value is that some negative (or low) book value companies are truly value companies and that value strategies based upon price/book are therefore ignoring/excluding companies that should be included if owning value stocks is the motivation. While there's no doubt this is true for some negative book value companies, let's examine this question for the portfolio of negative book value companies. We can ask the question of whether negative book value companies as a group are positively correlated with the value premium defined using price/book, price/earnings and price/cash flow. If so, this lends credence to the notion that these companies seem to behave like value companies even though they are excluded by price/book measures due to negative book value. Figure 5 plots the factor exposures of Professor French's portfolio of negative book value companies on the price/book, price/earnings and price/cash flow versions of the value factor, respectively, within the context of a regression analysis that is also controlling for market, size, profitability and investment factors. Factor exposures are estimated using the last 60 and 120 months of returns, respectively, ending February 2019. These two windows of time were chosen to focus on the recent performance of the portfolio of negative book value companies since the critiques of book value generally pertain to its recent history.

Figure 5: Value Factor Exposure of Negative Price/Book Equities
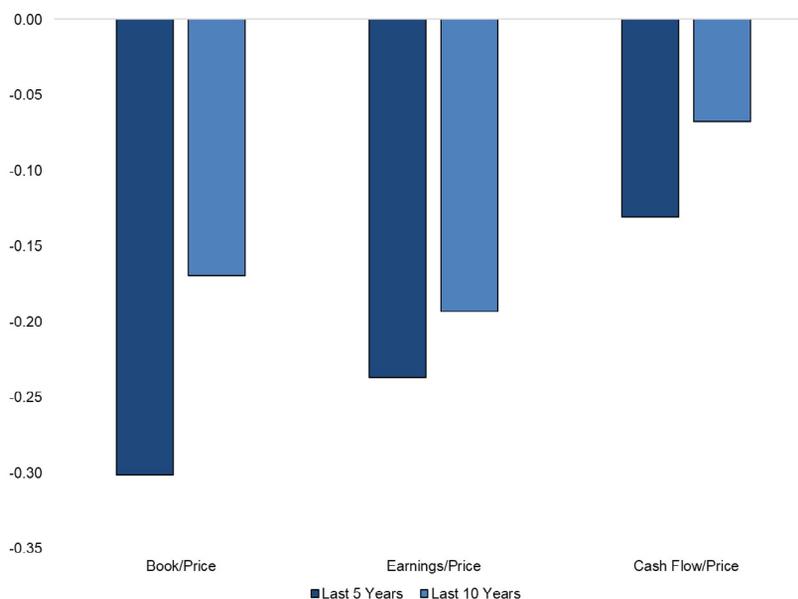

We see that the negative price/book portfolio has negative exposure to the value factor over both periods and over all three measures of value, meaning as a group negative price/book stocks appear to behave more like growth stocks than value stocks regardless of how value is measured. Furthermore, in all six regressions the negative book equity portfolio also has positive exposure to the profitability factor, which seems to add to the evidence that negative book value stocks generally behave more like growth stocks than value. So, the claim that funds that primarily use price/book are excluding a significant number of companies they should own seems false. It looks, instead, like most negative book value companies would be categorized as growth stocks under most measures of value.

HISTORICAL RETURNS OF THE VALUE PREMIUM

The summary of the above two sections is that 1) while the percentage of negative book value companies has been increasing, this percentage is still lower than the percentage of stocks with negative earnings, negative cash flow or no dividend payments and 2) negative book value stocks as a group seem to behave more like growth than value, so it's not clear that exclusion from highly diversified value portfolios matters, at least in a significant way. Let's now move to an examination of whether the value factor formed using price/book (HML, or "high minus low") is showing clear signs of deterioration relative to other ways of defining this factor (e.g., price/earnings, price/cash flow or price/dividends, as above). Based upon the critiques of book value, the basic prediction here would be that while the price/book value factor performed well in the past relative to other methods of identifying value stocks, its effectiveness has clearly begun to deteriorate.

We'll start this analysis by examining the decade-by-decade performance of four different value factors defined using price/book, price/earnings, price/cash flow and price/dividends, respectively. As a reminder, the average return of the value factor over a decade, for example, tells you how much the average annual returns of value stocks exceeded (positive number) or fell short (negative number) of the returns of growth stocks. Figure 6 presents the average annual returns of each of the four value factors on a decade-by-decade basis (note that the 1950s and 2010s are partial decades), the full period of 1952–2018 and the period of 2000–2018.

Figure 5: Value Factor Exposure of Negative Price/Book Equities
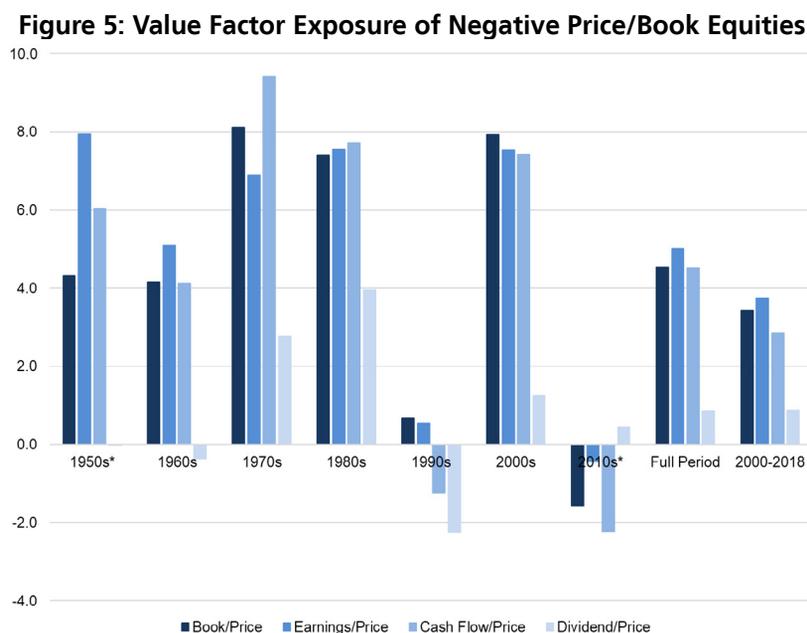
From Figure 6 we generally see that over longer periods of time returns are similar for price/book, price/earnings and price/cash flow measures of value, with the value factor constructed using price/dividends the poorest performer of the group by a large margin. We also see the familiar result that the value factor has generally been positive over most decades regardless of how it was constructed, with the exceptions of the decade of the 1990s and 2010¬–2018. If we focus on the more recent periods of 2000–2018 and 2010–2018 — presumably the periods where the applicability of book value began to deteriorate — we see nothing in the returns data that clearly makes the deterioration case. The value factor constructed using price/book was the second best performer of the four over the period of 2000–2018 and next to last over the period of 2010–2018. Furthermore, note that three of the four measures of the value factor produced negative returns from 2010–2018, so if you owned a diversified value portfolio, it's highly likely you underperformed growth stocks regardless of the metric chosen to select value stocks. In other words, selecting value stocks using book value was at best a secondary problem over this period.

Let's dig a bit deeper, though, into the 2010–2018 result for the value factor formed using price/book, analyzing it relative to the performance of the value factor formed using price/earnings since it was the second best performer of the group (I'm intentionally ignoring the value factor formed using price/dividends because I think we can all safely assume, both logically and based upon the data, that it's a terrible metric for selecting value stocks). The primary question we'll ask and answer is whether the value factor constructed using price/earnings has earned reliable alpha relative to the value factor constructed using price/book over this period, using monthly data for the analysis. Table 1 presents the data from a regression of the returns of the value factor constructed using price/earnings on the value factor constructed using price/book.

Table 1: Regression of HML P/E on HML P/B (1/2010–12/2018)

Alpha (bps)	t-stat	HML P/B	t-stat	R-squared
3	0.3	0.54	11.6	56%

The first thing that jumps out is that monthly alpha was just three basis points and not remotely close to statistically significant. In English, this means the value factor constructed using price/earnings did not generate reliably higher returns than the value factor constructed using price/book, meaning there is no evidence of a systematic problem with price/book from a returns point of view. Interestingly, though, it also shows that the value factor constructed using price/book does tend to be more volatile than the value factor built using price/earnings. The practical meaning of this is that one might expect better performance from price/book-based value relative to price/earnings-based value when value is doing well and vice versa when growth is doing well.

So let's summarize what I believe we know from the above. We have scant returns-based evidence of broad-based problems with price/book associated with negative book value stocks. Nevertheless, completely ignoring all negative book value equities is likely not optimal, and this issue could become more of a problem if the percentage of negative book value stocks continues to climb (keep in mind, though, that these measures remain below the percentage of companies with negative earnings, negative cash flow or no dividend payments). Second, using returns data, we have no evidence over either the ultra-long term or more recent periods like 2000–2018 or 2010–2018 that something is clearly wrong with value formed using price/book compared to value formed using other measures.

PROFITABILITY AND MOMENTUM

Lest I be too easy on price/book-based value, I do want to note two clear critiques of using price/book with no other input (i.e., not looking at other measures of value or what other factors have to say about a particular equity). To be clear, I'm not aware of any fund managers that do this, but it's still worth pointing out. First, let's start with the critique that does seem to be unique to price/book-based measures of value. Price/book-based value tends to own less profitable companies (or, before the stats nerds attack me, tends to behave like it owns less profitable companies) when compared to other measures of value like price/earnings or price/cash flow. Table 2 helps illustrate this with two different regression analyses. The first regresses the value factor formed using price/earnings on the value factor formed using price/book, as before, but also adds a second variable, the profitability factor (RMW, or "robust minus weak"), from Professor French's data library. The second performs the exact same analysis but with the value factor formed using price/cash flow as the dependent variable.

Table 2: Regressions on HML P/B and Profitability (RMW)

Alpha (bps)	t-stat	HML P/B	t-stat	RMW	t-stat	R-squared
0	0.0	0.57	13.7	0.33	5.4	65%
-16	-1.5	0.53	11.1	0.47	6.8	58%

The important portion of the above table is the RMW column. We see that both the price/earnings and price/cash flow-based measures of value are positively exposed to the profitability factor, RMW, within the context of also controlling for value using the price/book measure. The interpretation here is that both these measures of value tend to own more profitable stocks (or conversely, that price/book-based value will tend to own relatively less profitable stocks). To the degree you believe this is a good thing, it's important to understand the differences across the measures of value on the profitability dimension.

Regardless of how a diversified value portfolio is formed, it tends to have exposure to negative momentum if momentum is not specifically accounted for. To see this, we can examine the correlation of each of our three measures of the value factor — using price/book, price/earnings and price/cash flow — to the momentum factor from Professor French's site. Figure 7 plots the annual correlation of each of the three measures of value with the momentum factor over the full data set 1952–2018.

Figure 7: Value Factor Annual Correlation with Momentum
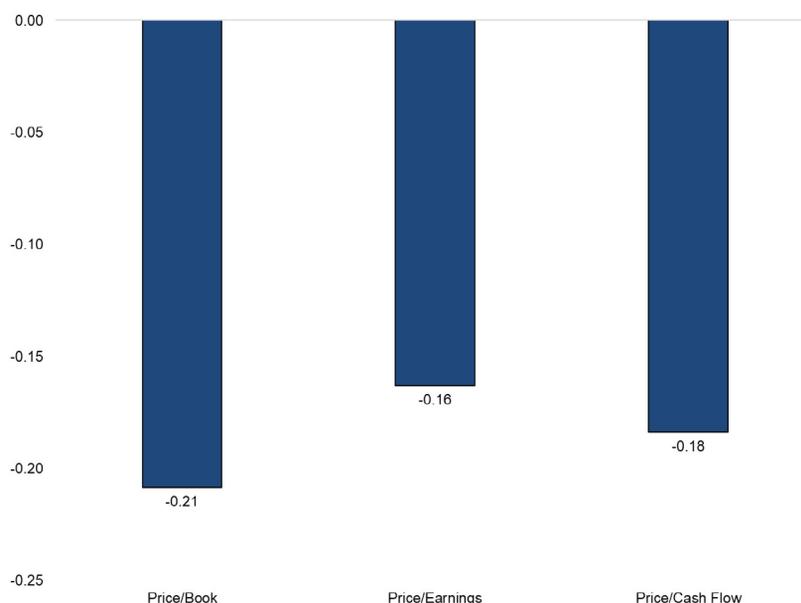
For each of the three ways to measure the value factor, the correlation with momentum is negative, meaning intuitively that regardless of how value is defined, it tends to own stocks that have done relatively poorly over the last year.

SUMMARY

Both the value premium and book value as a measure of value stocks have been under recent attack. While I've addressed the performance of the value premium elsewhere, here I focus on whether there has been clear deterioration in the price/book measure as a way to sort stocks into value and growth categories. While there are no doubt flaws with all measures of value, there doesn't appear to be any discernible inferiority of price/book as a measure of value relative to other commonly used metrics like price/earnings, price/cash flow or price/dividends, particularly if other factors like profitability are accounted for. The concern related to negative book value equities seems to be overdone, the performance of the various versions of the value factor have all been poor in recent history, and over longer histories price/book as a measure of value has performed admirably well, even over the relatively recent but still long-term period of 2000–2018.