

Is There Still Value in the Book-to-Market Ratio?

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Recently there has been much discussion in the financial press regarding whether current accounting procedures accurately reflect the investment in assets by business enterprises. Commentators such as Baruch Lev (*Barron's*, Nov. 20, 2000) argue that book value of common equity is a poor measure of a firm's net assets. Others have extended this argument to conclude that the book-to-market ratio no longer has a place in investment analysis. In particular, strategies that use the book-to-market ratio to identify value stocks have come under attack.

The purpose of this article is to examine the claim that the book-to-market ratio no longer contains any information that can be used to identify value stocks. The book-to-market ratio (BtM) is compared to other measures that are frequently mentioned as more relevant alternatives. The results indicate that ranking firms on BtM remains a valid way of identifying value stocks. The dispersion in annual returns that is produced by a book-to-market sort is greater than that produced by three alternative measures for the July 1963-June 2000 period. The dispersion is not reduced in later years, as suggested by the "new economy" criticisms of BtM rankings. Regardless of the merit of the criticisms of current accounting practices, ranking on BtM remains a valid way of selecting value stocks.

The Central Issue

During the past decade, technology has emerged as a dominant force in the US and world economies. The value that has been created by technological innovations is enormous. One of the criticisms of current accounting procedures is the fact that much of this technologically based economic value (referred to by Lev as "knowledge capital") is created by investments that are not found anywhere on a firm's balance sheet. Consequently, book value of common equity may be a downward-biased estimate of net asset value for some firms, especially in recent years. According to this view, the new economy has made book value (as currently calculated) obsolete. Extending this argument, some have argued that variables based on book value are also obsolete. As a result, ranking firms on BtM is viewed by some as a waste of time.

Even if book value does not accurately measure net assets for some firms, it does not necessarily follow that ranking firms on BtM is useless. Suppose a particular industry has tremendous growth prospects, and the firms in this industry all have BtM ratios around 0.1. They all appear in the bottom decile of the current BtM ranking. Now suppose that accounting procedures are retroactively changed, so that R&D and similar expenditures are capitalized, instead of being expensed. The result is an increase in book value for nearly all firms, and an especially large increase for the firms in this industry. Suppose the accounting change doubles their book values, so that their BtM ratios are now around 0.2. Although their BtM ratios increased more than those of most other firms, they are still in the bottom 25% of the BtM ranking, and nobody is in danger of adding them to a portfolio of value stocks. As long as value stocks (i.e., firms that are deemed by investors to be in distress and have poor growth prospects) have higher BtM ratios than other stocks, ranking on BtM will continue to be a valid way of identifying these stocks.

How can we judge whether ranking on BtM still allows us to identify value stocks? The best measure is dispersion in returns. Value stocks have had higher average returns than growth stocks for the past several decades, although there have been periods when this was not true (1999, for example). If a variable like BtM is still valid for distinguishing value stocks from growth stocks, we should see return differences for

stocks at opposite ends of the BtM ranking. Proponents of the new economy criticisms of book value would claim that the strong cross-sectional relation between BtM and returns should have weakened in recent years as the nature of the US economy has changed.

Alternatives to BtM

Several other accounting-based variables have been suggested as alternatives to BtM for identifying value stocks. Earnings to price (E/P), cash flow to price (CF/P), and sales to price (S/P) have received the most attention in empirical studies. The general conclusion is that these variables, along with BtM, are all highly correlated with one another, and they produce similar dispersion in average returns. The variable that has had the most success in producing dispersion in average returns over an extended period of time is BtM, but all four of these ranking variables tend to produce similar portfolios.

Proponents of the three alternatives to BtM typically argue that these variables are less susceptible to the new economy criticisms discussed above. They assume that the value added by technology will show up in earnings, cash flow, and sales before it will appear in book value. If this is true, then the correlation of BtM with the other three variables should have declined in recent years. A variable that is becoming irrelevant should not continue to track well with three variables that continue to be relevant.

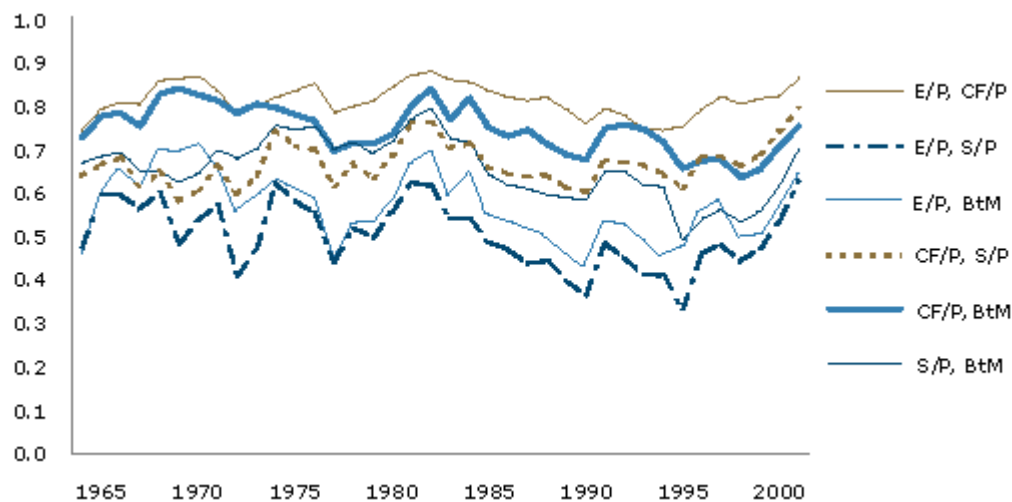
Based on the foregoing discussion, we know what to look for in our analysis of BtM. If BtM is to be abandoned as a way to identify value stocks, we should observe the correlation between BtM and its competitors falling in recent years. We should also see BtM unable to keep up with the other three variables in its ability to produce return dispersion.

Empirical Results

Figure 1 shows time series plots of pairwise Spearman rank correlation coefficients for the four variables of interest.¹ Rank correlations are used instead of correlations of the variables themselves, because it is the firm's rank that identifies it as value or growth. Variables that produce similar rankings will produce similar portfolios.

Figure 1

Spearman Rank Correlations for Fundamental Variables



Data courtesy of Compustat.

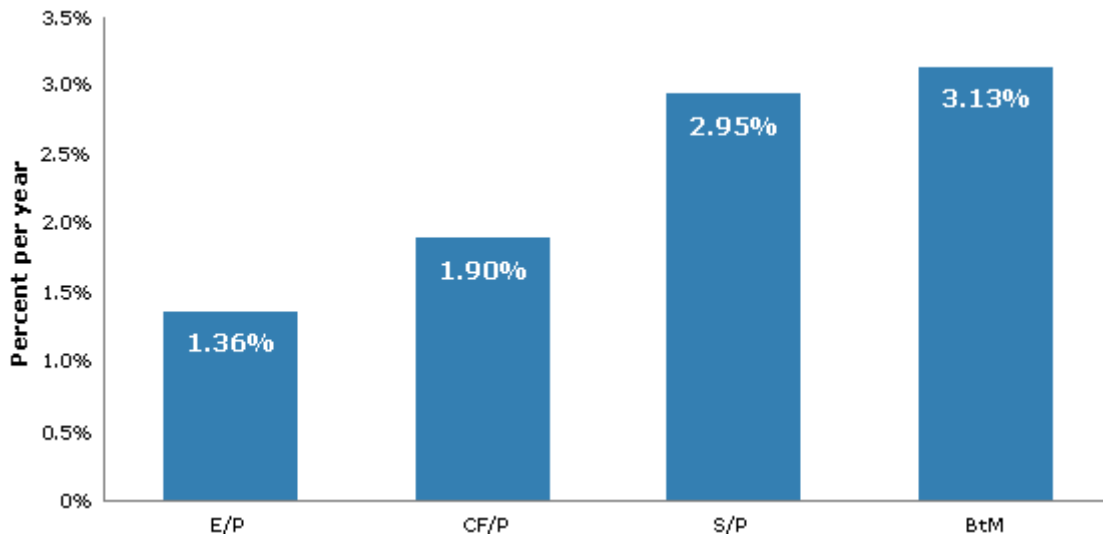
Note that all the correlation series tend to move together. There is a general downward drift from the early 1980s to the early 1990s, and then an upward trend from the mid 1990s forward. In particular, note that during the period when BtM is supposed to have become less relevant, its correlations with the other variables have actually been increasing. There is no evidence of BtM starting to behave poorly, relative to its competitors.

Figures 2-6 compare the ability of the ranking variables to produce dispersion in returns. For each variable, dispersion is defined as the difference in average annual returns between the top and bottom quintiles of the variable's annual ranking.² For the thirty-seven-year period ending June 2000 (Figure 2), BtM produced the highest dispersion in average annual returns, although sales/price produced return differences nearly as large. Figures 3-5 divide this thirty-seven-year period into three subperiods of approximately equal length. During the first subperiod, BtM produces the highest dispersion. During the two latter periods, BtM and S/P are about the same.

Figure 2

Average Annual Return Differences Between Extreme Quintiles

July 1963-June 2000

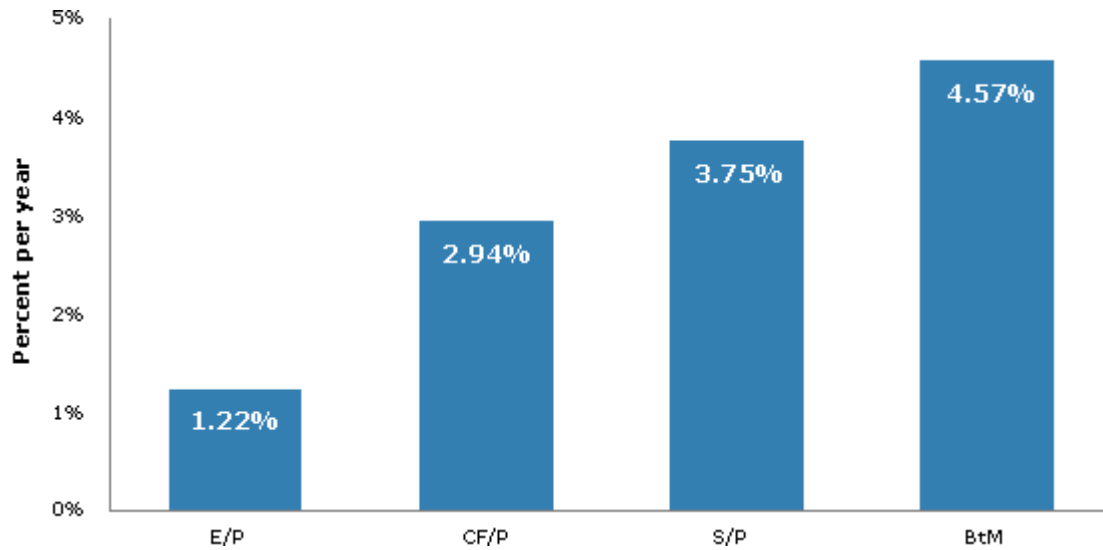


Data courtesy of the Center for Research in Security Prices, University of Chicago.

Figure 3

Average Annual Return Differences Between Extreme Quintiles

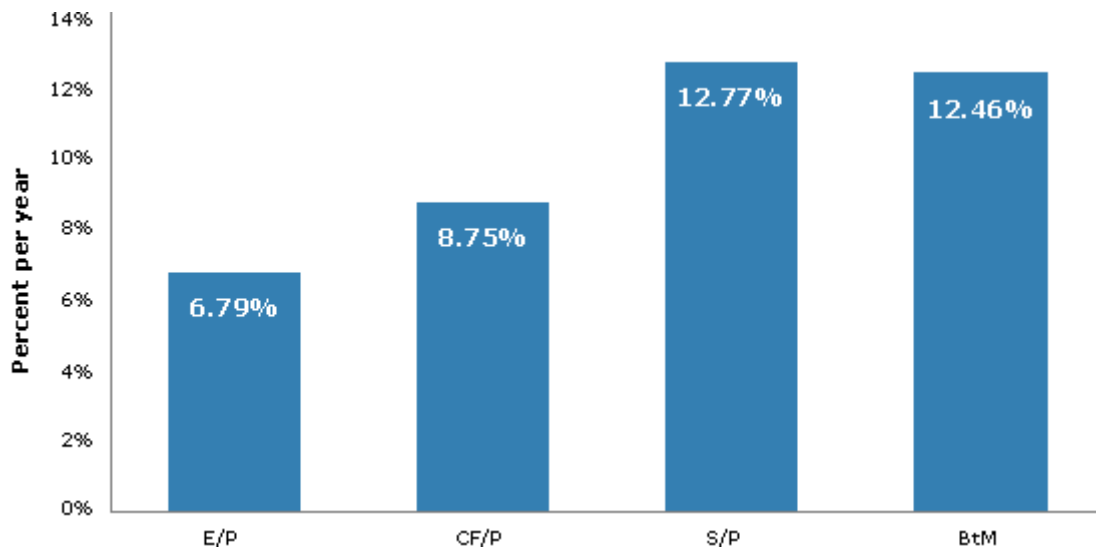
July 1963-June 1975



Data courtesy of the Center for Research in Security Prices, University of Chicago.

Figure 4

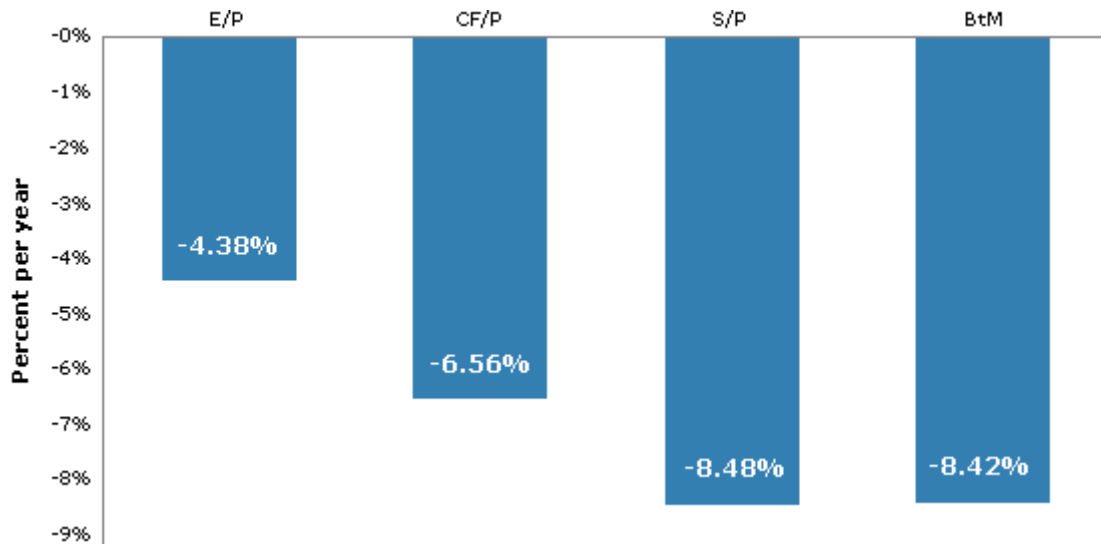
**Average Annual Return Differences Between Extreme Quintiles
July 1975-June 1988**



Data courtesy of the Center for Research in Security Prices, University of Chicago.

Figure 5

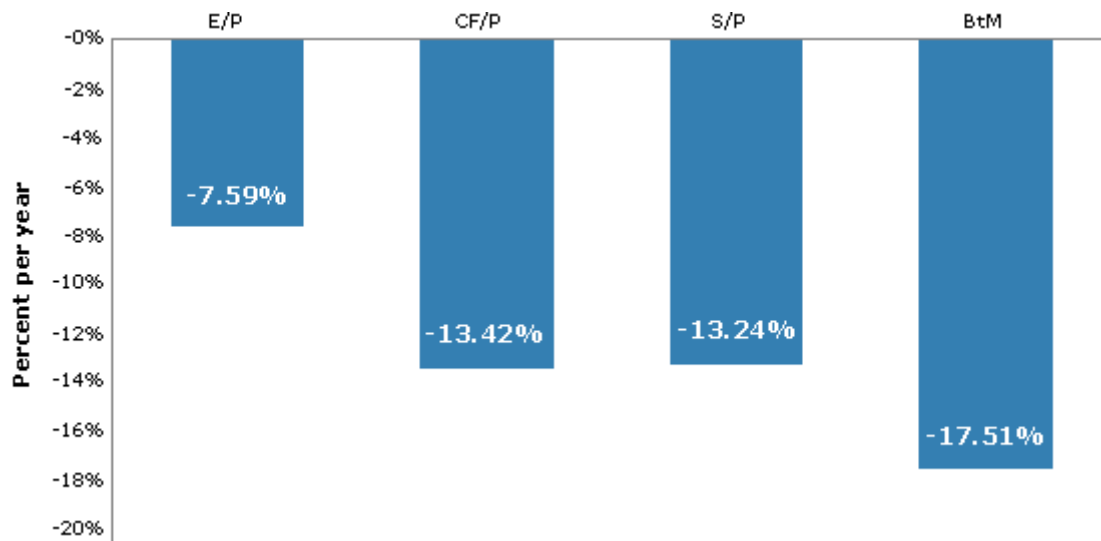
**Average Annual Return Differences Between Extreme Quintiles
July 1988-June 2000**



Data courtesy of the Center for Research in Security Prices, University of Chicago.

Figure 6

**Average Annual Return Differences Between Extreme Quintiles
July 1995-June 2000**



Data courtesy of the Center for Research in Security Prices, University of Chicago.

Both of these variables produce more return dispersion than E/P and CF/P, even during the period when BtM is supposed to be less relevant (Figure 5). Unfortunately for investors in value stocks, the return difference went the wrong way during the most recent twelve-year period. Some have argued that the effects of the new economy are most pronounced during the most recent five years, and this is the period when book value ceased to be relevant. Figure 6 shows the average annual return differences for this period. If anything, BtM worked too well.

Conclusions

There is no evidence of BtM becoming irrelevant for identifying value stocks. Compared to popular alternatives, BtM is at least as good at producing dispersion in average returns. This ability has not declined in recent years. The changes in the composition of the US economy during the past several years have not eliminated the strong cross-sectional relation between BtM and realized returns.

There is one advantage of BtM relative to its peers that should be mentioned. Since book value is a "stock" variable, while earnings, cash flow and sales are "flow" variables, there is a tendency for BtM rankings to be somewhat more stable over time than the rankings based on the other three variables. This reduces portfolio turnover for strategies that are based on BtM rankings. So, in addition to providing at least as much return dispersion as its competitors, BtM may also reduce the number of transactions that are triggered by stocks moving in and out of the portfolio's buy range. This can be especially important for taxable investors.

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¹ The sample each year is restricted to firms that have positive values for sales, book value, earnings, and cash flow. This is done so that each firm can be included in all four rankings. Market values are taken from CRSP, and accounting variables are taken from Compustat.

² It can be argued that ranking variables should be judged by average *absolute* return differences rather than average return differences. Using absolute return differences does not change any of the conclusions of this study. Since 1963, BtM has produced the largest absolute return difference in twelve of the thirty-seven years. Sales/price, earnings/price and cash flow/price produced the largest absolute dispersion in eleven, eight, and six years, respectively.

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