

# Price-to-Book's Growing Blind Spot

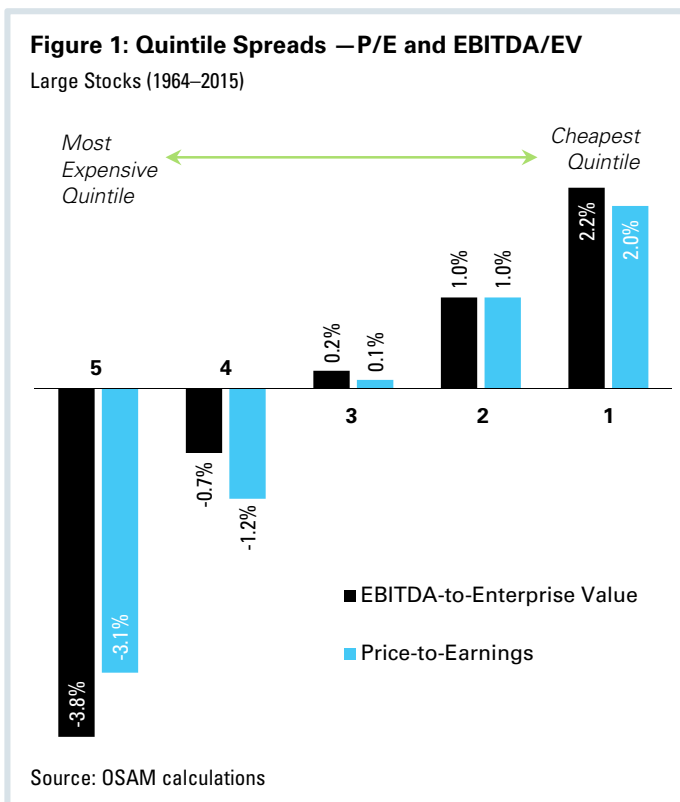
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Value has broadly been accepted as an investing style and, historically, portfolios formed on cheap valuations have outperformed expensive portfolios. But value comes in many flavors, and the factor(s) you choose to measure cheapness can determine your long-term success. In particular, several operating metrics of value, such as earnings and EBITDA, have outperformed the more traditional price-to-book (P/B) factor. A possible reason for the limited efficacy of price-to-book is because of the increase in shareholder transactions, primarily through the increase in share repurchases.

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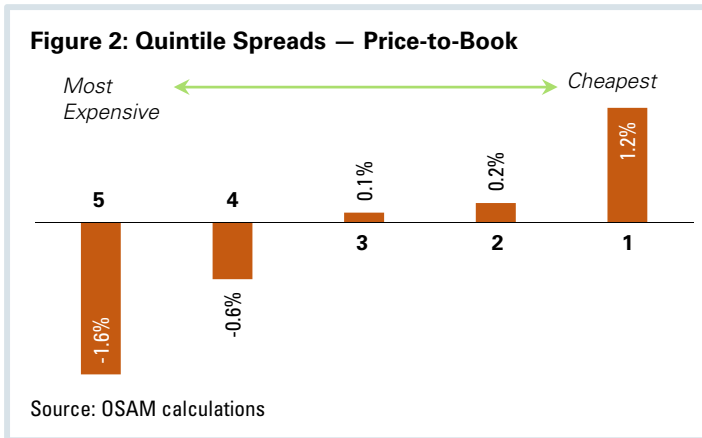
Valuation factors have the benefit of being simple, but can also have flaws. Price-to-sales has the benefit of measuring against *revenue*, which is difficult to manipulate, but it doesn't take *margins* into account. Price-to-earnings (P/E) measures against the estimated *economic output* of the company, but also contains estimated *expenses* that can be manipulated by managers. EBITDA-to-enterprise-value (EBITDA/EV) has the benefit of including *operating cost* structures, but it misses *payments* to bondholders and the government. Even with these flaws, the factors are effective in practice. Figure 1 shows the quintile spreads of two factors within a universe of U.S. Large Stocks from 1964 through 2015.<sup>1</sup>



Price-to-book is perhaps the most widely used valuation factor in the investing industry. Russell, the top provider of style indexes for the U.S. market, uses the factor as its primary metric to separate stocks into Value and Growth categories. They use price-to-book in combination with forecasted two-year growth and historical five-year sales-per-share growth, but price-to-book is the chief determinant, comprising 50 percent of the methodology. Russell's choice of price-to-book most likely comes from its long history in academic research. The seminal work on price-to-book is Fama-French's 1992 paper "The Cross-Section of Expected Stock Returns", which established the three-factor model of Market, Size, and Price-to-Book.

But when you start looking closely at price-to-book, a few issues start to become apparent. First, the overall spread on the factor isn't as strong as it is with other operating metrics. The spread between price-to-book's highest and lowest quintiles (see Figure 2) is only 2.8 percent—versus price-to-earnings' 5.1 percent spread and EBITDA-to-enterprise value's 6.0 percent spread.

<sup>1</sup> Quintile portfolios are formed on the Large Stocks universe (stocks in Compustat with a market capitalization greater than average) and rebalanced every month with a one-year holding period.



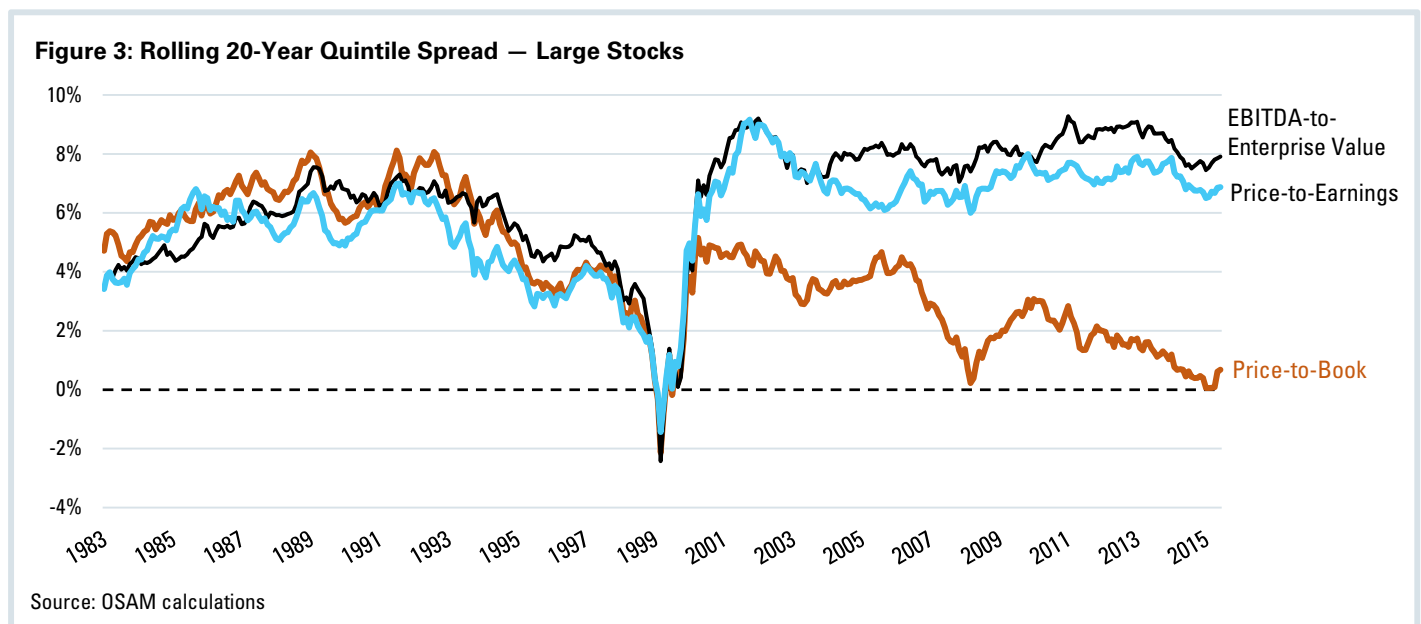
Second, when breaking down the efficacy of the factor based on market capitalization, price-to-book is least effective within the largest cap stocks. Table 1 shows the same quintile spreads of price-to-book in the U.S. Large Stocks universe, but separates out the smallest and largest third based on market cap. Price-to-book degrades in efficacy as the market cap gets larger—the quintile spread within the largest third of stocks is only 1.2 percent. This is especially noteworthy because Russell market cap-weights their benchmark and about two-thirds of it is in that Largest Third (with the lowest price-to-book spread of the three Large Stocks groups).

**Table 1: Excess Return of Price-to-Book in U.S. Large Stocks by Market Cap Grouping**

Market Cap:	5	4	3	2	1	Spread
Largest Third	-1.5%	-0.9%	-0.8%	0.6%	-0.3%	1.2%
Middle Third	-2.3%	-1.1%	0.0%	0.4%	0.9%	3.1%
Smallest Third	-0.9%	-0.3%	0.7%	-0.5%	2.0%	2.9%

Source: OSAM calculations

Last, the efficacy of price-to-book has been waning, especially since the turn of the century. Figure 3 shows the rolling 20-year quintile spread (the difference between the portfolio of the cheapest 20 percent and the portfolio of most expensive 20 percent). Comparing price-to-book against EBITDA-to-enterprise value and price-to-earnings, it shows how all three metrics behaved very similarly before 2000. They had generated consistent outperformance until being inverted in the dot-com bubble of the late 1990s, when the most expensive stocks outperformed. But coming out of the dot-com bubble, price-to-book has started behaving differently than other valuation factors, degrading to the point where for the past 20 years it has had almost no discernible benefit on stock selection.



On the surface, using book value in relation to price makes intuitive sense. The book value of equity is the total amount of common equity shareholders would receive in liquidation (the difference between the accounting value of the total assets and the total liabilities and preferred equity). The price-to-book factor is meant to be a quick measure for seeing how cheaply the company could be acquired. The factor will move around based on changes in either the market value or book value of equity. But the factor comes with assumptions. “Clean surplus accounting” is based on the assumption that equity only increases (or decreases) from the earnings (or losses) *in excess of dividends*. In practice, there is another influence on equity: transactions with shareholders.

When a company repurchases shares, the market effect is straightforward. The number of shares outstanding are reduced while the price remains the same, so the market capitalization goes down. When taking the share buybacks into account for financial reporting, the repurchase of shares does not create an asset as if the company had repurchased equity in another company. Instead, the equity value is decreased by *the amount spent in purchasing the shares*.

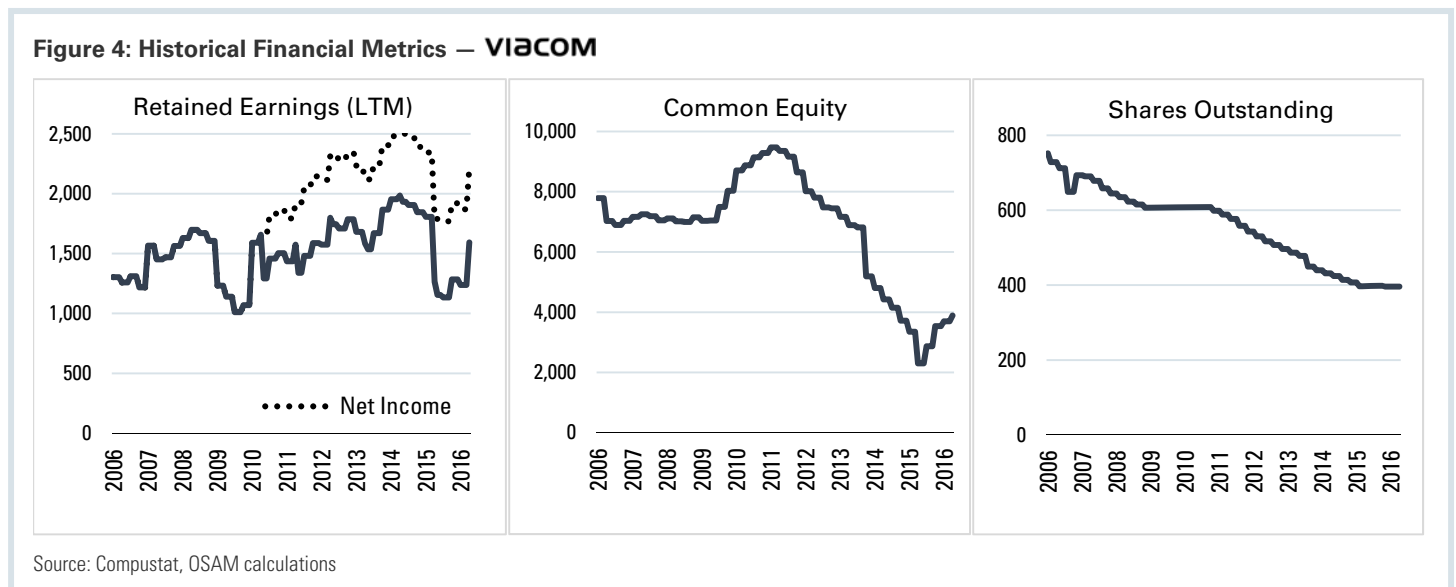
As a hypothetical example, take a company with a \$200 million market cap, \$100 million in book value of equity, and \$10 million in earnings. The company has a price-to-earnings ratio of 20, and a price-to-book ratio of 2.

$$\frac{P}{E} = \frac{200}{10} = 20 \qquad \frac{P}{B} = \frac{200}{100} = 2$$

If that company becomes an aggressive Repurchaser and decides to acquire \$50 million worth of its own equity, it will alter the results significantly. The earnings remain the same but the market cap goes down, adjusting the price-to-earnings down to 15. But the price-to-book ratio will be reduced on both the top *and* bottom and it will actually *increase* to three.

$$\frac{P}{E} = \frac{200 - 50}{10} = \frac{150}{10} = 15 \qquad \frac{P}{B} = \frac{200 - 50}{100 - 50} = \frac{150}{50} = 3$$

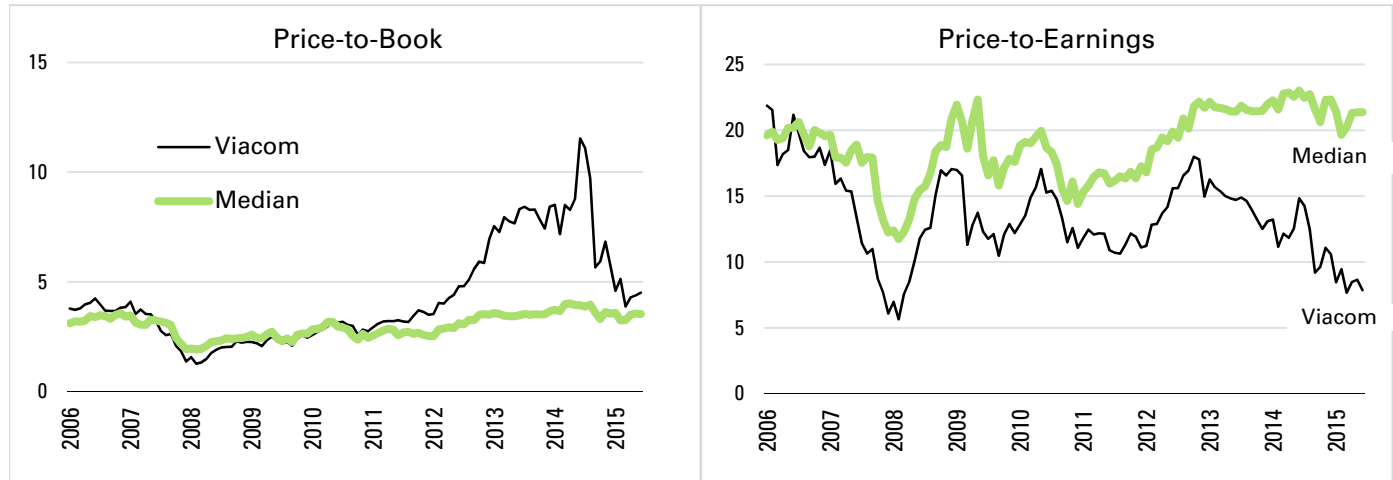
As a practical example, Viacom has been aggressively repurchasing its own shares after separating from CBS in 2006, spending almost \$20 billion over the past ten years. In 2015 alone, it repurchased about \$1.4 billion in shares. So even though the company has been seeing retained earnings of about \$1.5 billion per year, its common equity has reduced from \$8 billion to \$4 billion over that same time frame.<sup>2</sup>



<sup>2</sup> Compustat used as source for the Viacom data.

You can see how this distorts valuation factors. Viacom trades at a significant discount on earnings versus the median price-to-earnings for other large stocks, while at the same time looking as though it trades at a significant premium on the book value of equity.

**Figure 5: Historical Valuation Factors – VIACOM**



Source: Compustat, OSAM calculations

A company issuing shares will have the reverse effect. The company will actually *increase* its book value, even though the earnings and cash flows are diluted across more investors. Any transaction for a company, through the issuance or reduction of equity, flows through the book value of the equity.

Table 2 compares median valuation factors for companies with a market capitalization greater than average. Two groups are compared with the median large stock: those companies that have repurchased the most shares over the past five years (Repurchasers) and those that have issued the most shares (Diluters). The top 25 Repurchasers have better operating valuation metrics (*e.g.*, sales, earnings, EBITDA, free cash flow) than the median, and the top 25 Diluters have worse results—with the standout exception of price-to-book. Repurchasers have an average price-to-book of 4.5, almost 20-percent higher than the median 3.8, while Diluters look cheap with a price-to-book of only 2.7—an apparent discount of almost 30 percent.<sup>3</sup>

**Table 2: Valuation Factors for Large Stocks by Share Activity**

	Top 25 Repurchasers	U.S. Stocks Larger than Average	Top 25 Diluters
<b>Price-to-Sales</b>	1.4	2.3	5.2
<i>Percentile*</i>	30	50	84
<b>Price-to-Earnings</b>	16.8	22.5	286.3
<i>Percentile*</i>	29	50	88
<b>EBITDA-to-Enterprise Value (%)</b>	9.8	8.3	6.4
<i>Percentile*</i>	36	50	75
<b>Free Cash Flow-to-Enterprise Value (%)</b>	4.0	2.8	2.0
<i>Percentile*</i>	32	50	64
<b>Return on Equity (%)</b>	26.9	15.7	6.2
<i>Percentile*</i>	37	50	84
<b>Price-to-Book</b>	4.5	3.8	2.7
<i>Percentile*</i>	58	50	34
Percentage of Names in R1000V	44.0%	57.8%	56.0%

Source: Compustat, OSAM calculations

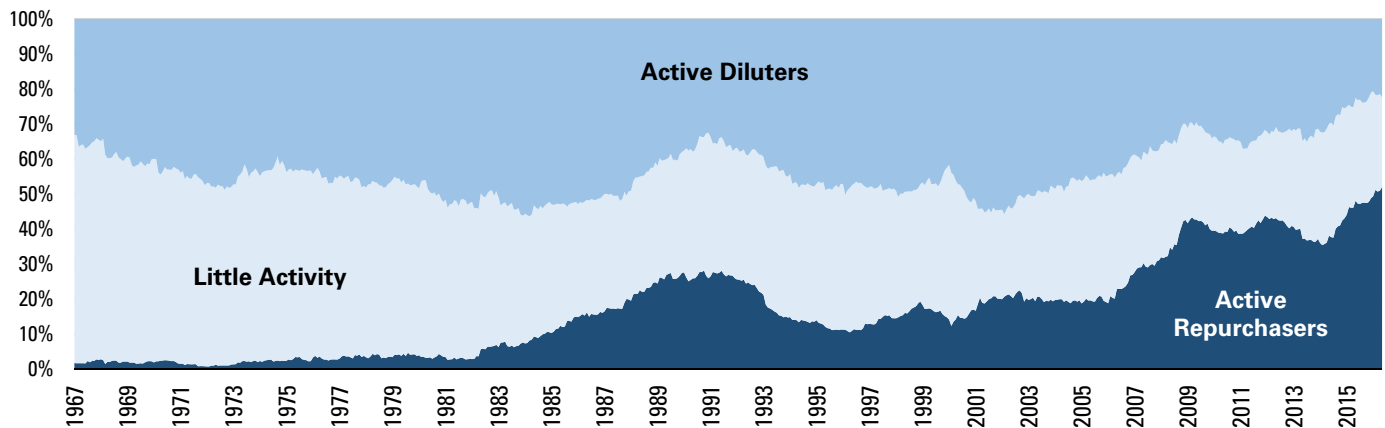
\* The lower the number, the better the score.

<sup>3</sup> Compustat source used for R1000V constituents (as of 5/31/16).

This distortion suggests that using price-to-book could lead to misclassifications of stocks as a Value investment. Stocks that are cheap on operating metrics like sales, EBITDA, or earnings could end up classified as Growth. Conversely, that universe could include a company that has issued a lot of stock and has inflated its book value of equity. This is something to keep in mind, as a number of quantitative managers start with the *benchmark* as their universe. Starting with the Russell 1000® Value could bias you towards a number of companies that look cheap on price-to-book but are not cheap on other important valuation metrics.

Over the past fifty years, there has been a gradual increase in the amount of company equity transactions. In particular, larger companies have been increasing their share repurchase activity. In classifying companies based on a trailing five-year change in shares outstanding, we can see which companies have consolidated shares by more than five percent, issued shares more than five percent, or have been relatively inactive. In 1982, the U.S. loosened regulation around a company’s restrictions for repurchasing shares and there has been a significant increase in activity. This has led to a change in the overall market, where the percentage of companies inactive has been reduced—from almost 60 percent in the 1960s down to around 28 percent—with the activity mainly being driven from companies consolidating shares.<sup>4</sup>

**Figure 6: Large Stocks by Rolling 5-Year Share Activity**



Source: OSAM calculations

**Table 3: Large Stocks Share Activity by Decade**

Year	Active Repurchasers	Little Activity	Active Issuers
1967–1969	2.1%	59.6%	38.3%
1970s	2.6%	52.4%	45.0%
1980s	12.3%	37.8%	49.9%
1990s	17.9%	38.3%	43.7%
2000s	24.5%	31.2%	44.3%
2010s	41.7%	27.8%	30.5%

Source: OSAM calculations

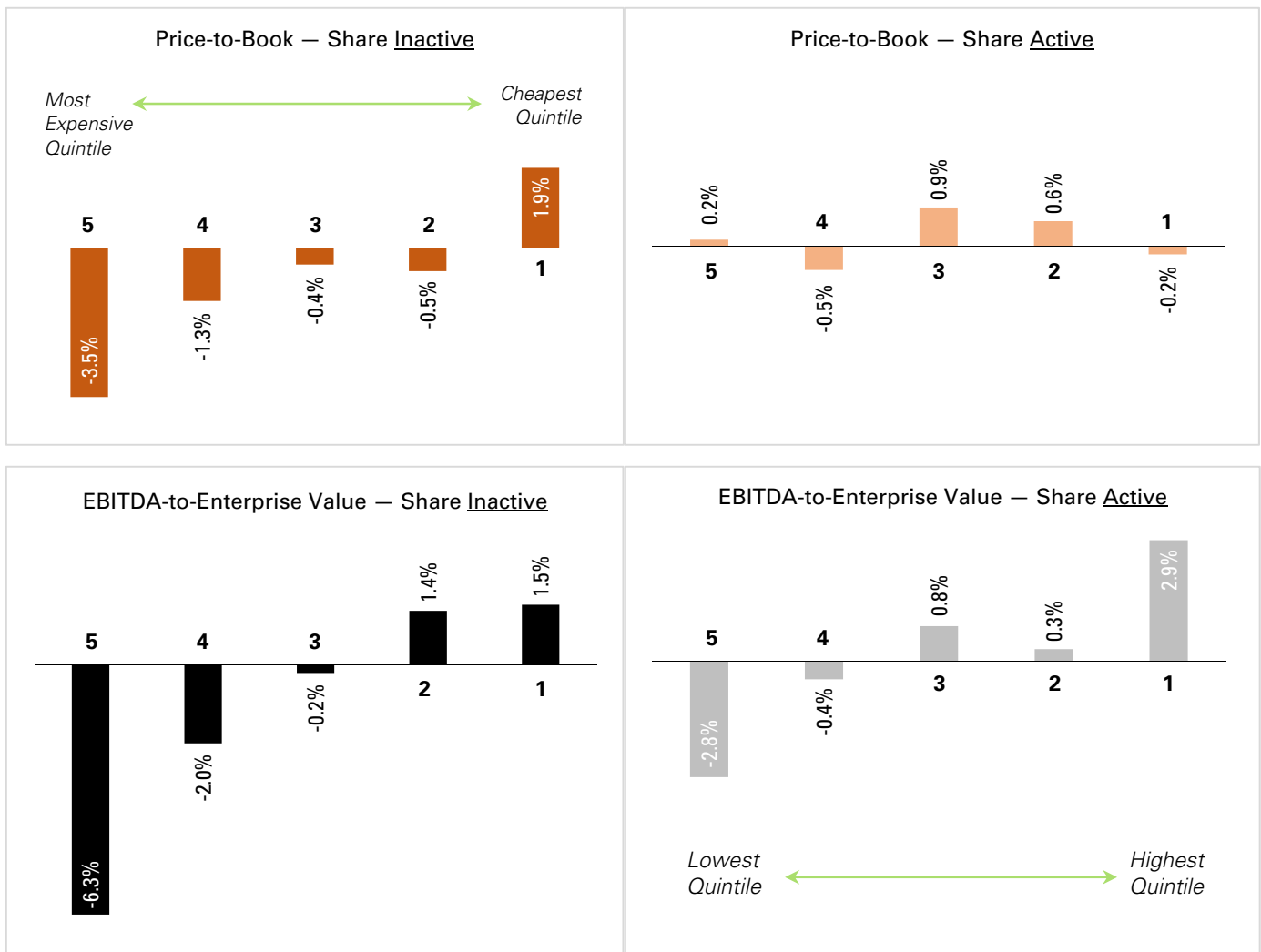
This begs the question: Does a moderate increase in shareholder transactions result in price-to-book gradually becoming ineffectual as a valuation factor? The first rule in analysis is not to confuse *correlation* with *causation*. However, the rolling 20-years when price-to-book has been less effective coincides quite well with the increase in shareholder transaction activity. Price-to-book is also the least effective in the largest cap stocks, which have the greatest volume of dollars affecting book value of equity. Perhaps the most interesting analysis is looking at the efficacy of price-to-book within those large stocks that have been relatively *inactive* with shareholders over a trailing five-year period versus those that have been *active*,

<sup>4</sup> Large Stocks universe, with Compustat as source for share repurchases. Price-to-earnings (earnings yield) generates a spread of 5.1 percent between the highest and lowest quintile, and EBITDA-to-enterprise value generates a 6.0 percent spread.

either on issuance or repurchase. From the 1982 legislation change to the present, there is a different level of valuation metrics' efficacy for companies that are active or inactive with shareholders. If your investments are focused on companies with share issuance or repurchase activity, there has been no relative benefit to buying companies that look cheap on price-to-book and there's almost no difference between high and low valuations. But, when limited to companies that are relatively inactive, you can get a spread of 6.4 percent between the highest and lowest 20 percent based on the price-to-book factor. Using a different valuation metric, such as EBITDA-to-enterprise value, works well—regardless of a company's activity in issuing or repurchasing shares.

Even with the long-term degradation of returns from price-to-book, it is possible that it may revert to an effective investment factor. Price-to-book has been off to a strong start in 2016 and is outperforming other valuation factors, particularly in small cap stocks. But there are structural challenges to the factor and, before using it, investors need to be made aware of the embedded noise from repurchases that could be misleading.

**Figure 7: Factor Quintiles by Share Activity (1983–2015)**



Source: Compustat, OSAM calculations

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