The Value Trap: Value Buys Risky Growth

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Abstract. Value stocks earn higher returns than growth stocks on average, but it is well documented that those returns come with risk. This paper supplies an understanding of that risk in terms of fundamentals. The fundamental analysis informs that, in buying value stocks, the investor may be trapped into buying firms where prospective earnings growth is quite risky. However, the trap can be avoided by recognizing how earnings and book value are accounted for in financial statements. Specifically, the application of conservative accounting informs the investor ex ante of the risk involved. A striking finding emerges from the accounting analysis: high B/P ("value") is associated with higher expected earnings growth, but growth that is risky. This contrasts with the standard labeling that nominates low B/P as "growth" with lower risk. "Value" actually buys risky growth.

The Value Trap: Value Buys Risky Growth

"Value" and "growth" are prominent labels in the lexicon of finance. They refer to investing styles that buy firms with low multiples ("value") versus high multiples ("growth"), though the labels sometimes simply refer to buying low price-to-book versus high price-to-book. History informs that value outperforms growth on average, but with risk: a value position can turn against the investor. Indeed the experience with value stocks in the last few years has been sobering. Despite the prominence of these styles, it is not clear what one is buying when one buys value or growth, and the labels are not particularly illuminating. The value investor in particular is anxious that he or she might be caught in a value trap.

This paper explains the value-growth return spread in terms of exposure to the underlying accounting fundamentals. When one buys a stock, one buys future earnings. Accordingly, price multiples imbed expectations of earnings growth; indeed, it is well-recognized that the earnings-to-price (E/P) ratio (or the P/E ratio) imbeds the market's expectation of future earnings growth. But growth can be risky, subject to shocks, so understanding the exposure to those shocks is the key to understanding the risk in buying value versus growth. The paper shows that, for a given E/P that imbeds expected growth, book-to-price (B/P) indicates the risk in buying that growth: a high B/P indicates a higher likelihood that expected earnings growth will not be realized. An investor buying a high B/P stock can fall into this trap.

However, the paper also shows that the investor can avoid falling into the trap by recognizing the accounting involved in reporting earnings and books value. A unifying theme underlies the analysis: Price multiples, like E/P and B/P, are multiples of accounting numbers; given price, they are accounting phenomena, a construction of the accounting involved. Thus,

one understands the risk in buying E/P and B/P by understanding the accounting behind earnings and book value. The paper shows how the accounting principle of conservatism in measuring earnings and book value imbeds risk in E/P and B/P ratios. Accordingly, the risk in value stocks is identifiable ex ante with an appreciation of the accounting involved; financial statements convey the risk that the investor is taking on in buying value versus growth.

Three points emerge from the paper. First, E/P and B/P are multiples to be employed together. Just as earnings and book value—the "bottom line" numbers in the income statement and balance sheet—articulate in accounting sense, so do E/P and B/P in an investment strategy: by applying these multiples together, the investor understands the risk exposure and the payoffs to that risk. Second, high B/P—a value stock—buys higher earnings growth. This is surprising, for the standard labeling implies that it is "growth" (a low B/P) that buys growth, not "value." Third, the higher growth associated with high B/P is risky: high B/P stocks are subject to more extreme shocks to growth. These are empirical findings but, first and foremost, the paper demonstrates that they are properties implied by the accounting for earnings and book value.

There has, of course, been substantial research showing that "value" is more risky than "growth." Most of that research demonstrates the risk in terms of return outcomes. Our paper explains the risk in terms of the fundamentals that drive those returns. Much of the existing research attempts to explain the value-growth return spread as exposure to common risk factors. A notable contribution is that of Fama and French (1993) who construct a factor model where the higher returns to high versus low B/P are attributed to sensitivity to a "book-to-price risk factor" (along with the market factor and a "size factor"). However, as this book-to-price factor was identified largely from data dredging, there is little understanding of why B/P might indicate risk and return. Numerous conjectures abound, many of which have been investigated empirically

with some support. But it is fair to say that the "book-to-price effect" in stock returns remains somewhat of a mystery. This paper supplies an understanding via the fundamentals: B/P buys risky earnings growth. Of course, higher returns to value may reflect mispricing rather than risk. Even so, it would be worthwhile to understand the risks that one is taking on in pursuing alpha.

We are not the first to associate the value-growth spread with fundamentals, of course. Fama and French (1995), for example, show that B/P is associated with low profitability and Cohen, Polk, and Vuolteenaho (2009) and Campbell, Polk, and Vuolteenaho (2010) calibrate the risk with fundamental ("cash-flow") betas.[1] While we extend this empirical analysis, the aim is not just to add more evidence on the risk in value stocks. Rather, it is to show *why*. We show *why* value connects to low profitability and *why* that connection implies the risky outcomes documented by the Cohen, Polk, and Vuolteenaho papers. Our analysis, in turn, leads to a demonstration of how accounting conveys this risk ex ante and how an understanding of that accounting exposes the value trap.

Section 3 develops this theme. But first we document the returns to value versus growth during our sample period.

1. Returns to Value versus Growth

Panel A of Table 1 reports the average annual returns to investing on the basis of E/P and B/P during the years 1963-2012. The sample covers all firms on Compustat at any time during those years, except financial firms (SIC codes 6000-6999), firms with negative book values, and firms with per-share stock prices less the $0.20. Earnings and book value of common equity are from Compustat. Prices for the multiples are those three months after fiscal-year end at which time accounting numbers for the fiscal year should have been reported. Like earnings and book value,

prices are per-share, adjusted for stock splits and stock dividends over the three months after fiscal-year end. Annual returns are observed over the 12 months after this date, calculated as buy-and-hold returns from monthly returns on CRSP with an accommodation for firms not surviving the full 12 months. A total of 167,781 firm-year observations are available for the analysis.[2]

Table 1 is constructed as follows. Each year, firms are ranked on their E/P ratios and formed into five portfolios from low to high E/P (along rows in the table). Then, within each E/P portfolio, firms are the ranked on their B/P and formed into five portfolios (down the columns in the table). This nested sort ensures that the B/P sort is for firms with a given level of E/P. Panel A of the table reports average equally-weighted portfolio returns over the subsequent 12 months from replicating the strategy each year in the sample period. Panel B reports average value-weighted returns for the portfolios. Panels C and D report the average E/P and B/P for the portfolios. The low E/P portfolio is all loss firms.[3]

The first row in Panel A reports returns for E/P portfolios before ranking on B/P. It is clear that E/P ranks returns for positive E/P portfolios 2 – 5, as is well-known (and documented in Basu 1977 and 1983 and Jaffe, Keim, and Westerfield 1989, for example). Further, for a given E/P, B/P ranks returns: the "book-to-price" or "value" effect in stock returns in evident, but now within stocks with a given E/P. The mean return spread between the 2.2% return for the low-E/P and low-B/P portfolio and the 28.8% return for the high-E/P and high-B/P portfolio is quite impressive.[4] Panel C of the table shows that the second sort on B/P is not a further sort on E/P, except for E/P portfolio 1 where the mean E/P is negative (loss firms) but where E/P is actually negatively correlated with B/P in Panel D.[5]

The results for value-weighted portfolios in Panel B are similar, though there is less of a spread of returns over the E/P and B/P spread. We report these returns understanding that investors often work with value-weighted portfolios to avoid weighting small firms too heavily. However, these returns somewhat dampen those expected from investing on the basis of E/P and B/P because, as in Fama and French (2012), we have confirmed that the book-to-price value effect is much reduced in large firms. Thus, weighting towards large market cap moves away from the effect under investigation. The equally-weighted returns in Panel A indicate the expected returns from investing in a random stock with a particular level of E/P and B/P. Nevertheless, the Panel B returns indicate the value versus growth effect is also evident in value-weighted portfolios.

This strategy has been trawled many times by value-growth investors (though not always with this structure). What explains the spread? In particular, do the return spreads reflect risk differences? To answer this question, we first introduce standard formulas for E/P and B/P ratios that connect the multiples to risk and growth. We then show why risk and growth are connected, the insight that provides the answer to the question and one that is supported by the data.

2. Connecting E/P and B/P to Risk and Growth

A standard formula for pricing earnings involves both risk and growth. For positive earnings,

$$P_0 = \frac{Earnings_1}{r - g} \tag{1}$$

where $Earnings_1$ is forward (year-ahead) earnings, r is the required return for risk borne, and g is the expected earnings growth after the forward year. This formula is strictly correct only for full payout, for then the substitution of earnings for dividends maps directly to the dividend discount

model. The formula is often modified to accommodate different payout policies—with a constant payout ratio in the Gordon model, for example. But, for expositional purposes, simplicity is a virtue and, under Miller and Modigliani (1961) assumptions, payout is irrelevant: while less than full payout increases expected earnings growth, *g*, it does not affect price.[6]

From (1), the forward E/P ratio is given by

$$\frac{Earnings_1}{P_0} = r - g \qquad (1a)$$

This expression shows that the forward E/P ratio is increasing in the required return and decreasing in expected growth (as is well-recognized). With no growth ($g = 0$), E/P equals the required return. But growth also affects the E/P ratio. The effect is typically seen as decreasing E/P, and indeed equation (1a) shows that this is so for a given required return: more expected growth means a higher price and a lower E/P. But what if buying growth is risky? Then more growth would mean a higher required return, *r*, with an offsetting, increasing effect on the E/P ratio.

Here is the point: in the determination of price in equation (1), earnings are capitalized at the rate, $r - g$; it is $r - g$ that bears on the price, not *r* and *g* as independent inputs. If *r* increases with *g*, because growth is risky, the capitalization rate is higher with increasing *g*, yielding a lower price compared with the case where *g* increases without any effect on *r*.[7] So, a given E/P could indicate risk with no expected growth ($g = 0$), high growth with high risk (and a high required return), or low growth with low risk (and a low required return).

Clearly there is some sorting out to do. The value investor buying a high E/P stock could just be loading up on risk: that stock might not be a low growth stock, but rather a stock with high but risky growth. Such a stock is labeled a value stock but may actually be a value trap.

It is not difficult to accept that buying earnings growth might be risky: a firm with high growth prospects is typically considered risky, and basic economics would suggest that a firm cannot invest to generate more earnings (growth) without taking on more risk, at least on average. We observe that stock prices settle up against earnings relative to expectation. This is clear from seeing stock prices move when earnings reports miss analysts' expectations, but more so in formal studies involving earnings and stock returns. Over long (five-year and ten-year) periods that include the realization of long-term growth expectations, the correlation between realized stock returns and realized earnings is very high; see, for example, Easton, Harris, and Ohlson (1992) and Ohlson and Penman (1992). In short, the risk of holding stocks is the risk that earnings will not meet expectations.

The value investor also favors high B/P stocks. Indeed, some define "value" stocks as those with high B/P and "growth" as those with low B/P. Dividing equation (1a) through by $Earnings_1/Book\ value_0$, B/P is given by

$$\frac{Book\ Value_0}{P_0} = \frac{Book\ Value_0}{Earnings_1} \times \frac{Earnings_1}{P_0} = \frac{Book\ Value_0}{Earnings_1} \times (r - g) \qquad (2)$$

This equation expresses B/P as the product of E/P ratio and the (inverse of the) book return on equity, $ROE_1 = \frac{Earnings_1}{B_0}$. It exhibits the well-known property that B/P is decreasing in the expected book rate of return, but is also determined by the required rate of return and expected

earnings growth. For a given ROE_1 and a given required return, book-to-price is decreasing in expected growth because growth adds to the price. That is behind the label that nominates a low B/P as a "growth" stock. But, once again, the required return would be higher if that growth were deemed to be risky. In that case, *r* increases with *g* in equation (2) to yield a relatively higher B/P: the effect of growth and risk cancel in the price. If so, a high B/P—a value stock—could be a stock where one is buying growth but growth that is risky. It, too, may be a value trap.

The B/P expression (2) adds an additional insight. E/P in expression (1a) is given by $r - g$ and we have depicted the investor's problem as one of sorting out whether this represents low growth with low risk or high growth and high risk. For a given E/P and thus a given $r - g$, equation (2) shows that (1) B/P is determined by the (inverse of the) *ROE*, (2) if a lower *ROE* is associated with a higher *g*, B/P must be higher, and (3) with that higher *g*, *r* must also be higher (to leave $r - g$ unchanged). Thus, a higher B/P indicates a higher *r*. In short, if g varies inversely with ROE_1 holding $r - g$ constant, then B/P is increasing in growth that adds to risk and the required return.

Table 1 ranks stocks on B/P while holding E/P constant. As E/P = $r - g$, the sort on B/P thus holds $r - g$ constant. So, these three points, stated under the condition that $r - g$ does not change, are relevant for the interpretation of the returns in Table1. However, the conditional *if* in the statement that links *ROE* to *g* is critical. Is there a reason why risky growth might be inversely related to *ROE*? Later in the paper, we show that is the case empirically, but first we demonstrate that it follows as a matter of accounting principle.

3. An Accounting Principle Connects Growth to Risk

Earnings and book value are accounting numbers. So, given price, E/P and B/P are accounting phenomena: the ratios are a product of accounting principles that determine how earnings and book value are measured. Accordingly, if B/P has anything to do with risk, it is likely to be a result of the accounting involved.

To illustrate, consider the B/P ratio for a (low risk) mark-to-market fund invested in U.S. government securities: B/P = 1. Consider also the B/P ratio for a (risky) equity fund also marked to market: B/P =1. These two assets, with different risk, have the same B/P, so B/P cannot indicate risk or expected return. Importantly, it is the accounting—mark-to-market accounting or, more generally, fair value accounting—that takes away the ability for B/P to indicate risk and expected return.

For most firms, B/P $\neq$ 1 and that must be the result of applying accounting principles other than fair value accounting. That accounting is, of course, historical cost accounting. Is there something about historical cost accounting that ties growth to risk and thus helps to understand the extent to which E/P and B/P indicate not only growth but also risky growth? The answer is yes.

Under historical cost accounting, earnings are not booked until certain conditions are satisfied. That accounting produces B/P $\neq$ 1. Indeed, $P_0 - B_0$ is simply future expected earnings that the market expects in setting the price, P_0, but which the accountants have not yet booked to book value—the earnings are expected to be added to book value in the future. The median price-to-book since 1962 is about 1.6, indicative of this delayed earnings recognition. The guiding accounting principle has to do with how accountants handle risk:

An Accounting Principle: *Under uncertainty, the recognition of earnings is deferred to the future until the uncertainty is resolved.*

This "realization" principle, taught in basic Accounting 101 class, instructs the accountant to book earnings only when the risk of actually "earning" the expected earnings is largely resolved. In terms of asset pricing theory, the accountant does not recognize earnings until the firm can book a relatively low-beta asset, usually cash or a near-cash receivable. Deferred earnings recognition means more earnings in the future, that is, earnings growth. So an expectation of future earnings that awaits "realization" is an expectation of earnings growth and, as that realization is tied to risk resolution, the expected growth is risky: it may not be realized.

The principle is the application of what is called conservative accounting, an apt term for dealing with risk. It has its expression in recognizing revenue only when a customer has been "sold," agreeing to a legal contract and, even then, only if "receipt of cash is reasonably certain." So expected revenues from the prospect of future customers, or even customer orders in the order book, are not booked, even though the expectation is appropriately incorporated in the stock price. Accountants see value from prospective customers as risky—the value may not be realized—and thus it is not unreasonable to conjecture that the stock market's expectation also be discounted for that risk. Even the receivables from actual sales are discounted (in allowances for credit losses) for the risk of not receiving cash from the sales. The application of conservative accounting is more general, however, and in most cases produces expected earnings growth. Deferred (or "unearned") revenues push revenues to the future, even though a customer has performed, because there is remaining doubt about the firm's performance. Accountants record anticipated losses (via asset write-downs and impairments) but not anticipated gains, leaving the

latter to be recognized in the future *if* the gains are "realized." Depreciation is usually deemed to be conservative (high) because of conservative (low) estimates on useful lives for plant.

Conservative accounting is practiced in the extreme when a firm expenses research and development (R&D) investments immediately against earnings (rather than booking them to the balance sheet as investment). This accounting reduces current earnings but increases expected future earnings from the investment, for now there is the prospect of future revenues from new products but no amortization of the cost of the investment against those future revenues. However, R&D may not produce saleable products, so it is risky. Indeed, the U.S. accounting standard that requires expensing of R&D (FASB Statement No. 2) justifies the treatment because of "the uncertainty of future benefits."[8] The same treatment applies to investment in brand building through advertising (to gain future revenue); advertising expenditures are expensed immediately, reducing earnings, but they generate the prospect of growth *if* the advertising is successful. And so with the required expensing of organization and store opening costs, investment in employee training, software development, and investments in distribution and supply chains. With lower current earnings and higher future earnings, the accounting is effectively shifting income to the future. Further, as most of the expensing applies to what would otherwise be fixed costs, earnings are so much higher should future revenues be realized: only variable costs have to be covered. The resulting expected earnings growth implies a lower E/P ratio. But the future earnings are risky: the earnings from the R&D and brand building, and that from anticipated future customers and unrealized gains, may not be realized. If so, the investor requires a higher r and consequently the E/P ratio is higher, by equation (1a).[9]

Further, conservative accounting also results in a lower *ROE*. Accrual accounting simply (!) involves an allocation of earnings to periods: life-time earnings are always equal to life-time

cash flows and accounting principles just allocate the total earnings over time. Thus, for the given total life-time earnings expected in the current price, P_0, more earnings deferred to the (long-term) future means lower short-term earnings, $Earnings_1$ and thus a lower ROE_1. That ties ROE_1 to growth. The case of R&D is illustrative: increased R&D investments reduce earnings and *ROE* (because of the immediate expensing) but the risky investment increases (risky) expected earnings growth. And so with all applications of conservative accounting—expensing advertising expenses, expensing start-up costs, expensing training costs, expensing customer development and distribution and supply-chain development, accelerated depreciation, and so on. For a given E/P, tying *ROE* to risky growth also ties B/P to risky growth, by equation (2).[10]

There is a flip side to conservative accounting: *if* and when the deferred earnings are recognized, *ROE* is higher. That is because the revenues have been realized and there are no deprecation or amortization charges against that revenue (the investments were written off when incurred). Further, expensing investments immediately means that book values in the denominator of *ROE* are lower: assets are missing from the balance sheet. Thus, with higher realized earnings on a lower book value base, *ROE* is particularly high (see the example for Coca Cola and pharmaceutical firms below). A high *ROE* thus indicates risk that has been resolved. For a given E/P, higher ROE with lower risk implies a lower B/P.[11]

Some case studies illustrate the point:

Facebook, Inc. traded in 2013 with significant growth prospects built into its market price. However, the firm was reporting an ROE of only 4 percent, due to the expensing of development costs to foster the growth. The development costs were investments to gain future revenue. Should those revenues be realized, Facebook will have significant earnings growth, not only from the revenues but because only variable costs will have to be covered: the fixed cost have already been expensed. The low ROE due to the expensing of these investments indicates potential earnings growth, but growth that is uncertain.

Twitter, Inc. went to IPO in November 2013, closing on its first trading day priced at 26 times estimated 2014 sales, a price imbedding significant growth expectations. The firm was reporting losses (and a negative ROE) due largely to the expensing of R&D, advertising and promotion that amounted to 80 percent of revenue. These expenditures were made to generate revenue and earnings growth, but there was uncertainty about whether the expected revenues and earnings would be realized.

Amazon.com, Inc. reported a loss for the third quarter of 2013, as it had done for the full year, 2012. Both losses were on rising sales and continued into 2014. The losses were attributed to "spending on technology and content, such as video streaming and grocery delivery to mobile devices" and the firm's "willingness to win customers by losing money." These investments were being expensed directly to the income statement, yielding a negative ROE. While high expectations were built into the share price, the results of these investments are uncertain; the added customers have yet to be realized. The standard view of Amazon—a firm investing heavily with the hope of becoming hugely profitable—is reflected in the accounting.[12]

In contrast to the above examples, Coca Cola Company was reporting an ROE of 25 percent in 2014 due to a brand investment that is omitted from the balance sheet, but one that actually delivers sales and earnings in the numerator of the ROE. This is a low-risk ROE, for the risk taken with the brand building investment has been resolved or "realized." Coke had a beta of 0.4.

Established, successful pharmaceutical companies typically report a high ROE. This is because their R&D investment has paid off with earnings from drug sales but the R&D investment is not on the balance sheet (and thus not in the denominator of ROE). In contrast, start-up bio-techs typically have very low (often negative) ROE as R&D investments are expensed to earnings.

During the 1990s, Starbucks Corporation was trading with considerable growth expectations built into its market price. However, it was reporting a book rate of return on its operations of less than 10 percent. Starbucks was expanding stores aggressively, expensing store-opening expenses, advertising, employee training, and supply chain development. This expensing depressed the book return, an indication that the growth strategy was risky. As it happened, the strategy paid off, with the book rate of return rising to over 20 percent by 2005. But the strategy was risky; it could have gone the other way.[13]

With the financial crisis in 2008 and the increased uncertainty in the aftermath, banks increased their loan loss reserves significantly, thus reducing their ROE. In 2013, with the improvement in credit conditions and resolution of uncertainty, the banks began releasing those reserves into earnings, producing earnings growth and higher ROEs.

Table 2 documents that *ROE* ties to expected growth more generally, in line with the accounting. Moreover, the E/P, B/P spread in Table 1 captures the connection, for the portfolios are the same as those in Table 1. First note, in Panel A, that B/P ranks *ROE* inversely within each positive E/P portfolio 2 - 5, as dictated by equation (2): For a given E/P, higher B/P is associated

with lower *ROE* and a low B/P is associated with high *ROE*. For the negative E/P portfolio 1, B/P is positively associated with *ROE*, but that also is implied by equation (2) when earnings are negative. Second, in Panel B, earnings growth is decreasing in E/P (across rows), consistent with the standard interpretation of the P/E ratio. Third, to the main point, the ranking on B/P (down columns in Panel B) is also a ranking on average realized growth two-years ahead: For a given E/P, lower *ROE* (in Panel A) is associated with higher subsequent earnings growth (in Panel B) and higher *ROE* is associated with lower growth. The relation is inversely so for B/P. In short, for a given positive E/P, B/P is (1) negatively associated with *ROE* but (2) positively associated with future earnings growth.[14] Fama and French (1995) recognize the first correlation, attribute the association of high B/P with low ROE to "distress," and justify the high returns to high B/P to the risk associated with distress. In contrast, an accounting principle explains the second correlation and connects B/P to growth.

It remains to ask whether the growth associated with B/P is risky growth that requires a higher return. Asset pricing theory says that this would be so only if any risk associated with the growth is non-diversifiable. We turn to this issue in the next section, but note that Penman and Reggiani (2013) construct portfolios which differ in the degree to which anticipated earnings are expected to be realized in the short term (one year ahead) versus the long term. They find that subsequent average returns are related to the degree of earnings deferral to the long term, indicating the market prices in the risk. Significantly, the portfolio construction that captures the earnings deferral translates to the same E/P, B/P double sort as in Tables 1 and 2.

However, one can readily imagine expected growth that adds to price rather than risk and the required return. A firm with a competitive advantage is an example. In this case, *g* increases without any effect on *r*, resulting in a higher price and a lower E/P ratio in equation (1a). That

leaves an open question: for a given E/P, how does the investor sort out whether he or she is buying growth that is risky or growth that adds value? The "value" investor asks the question: in buying high E/P, am I buying a stock with low growth or am I buying a stock where expected growth is high, but risky? If the latter, my value position will turn against me if the expected growth is not realized. The "growth" investor also has a question: in buying a low E/P, am I just buying growth with little risk so I must expect a low return?

4. B/P, Growth, and Risk

This section documents that B/P is associated not only with expected growth but also with the risk that the growth may not be realized. And it shows empirically that, as *ROE* is inversely related to the risky growth, a low *ROE* induced by conservative accounting conveys information about this risk and so answers the questions just raised.

Table 3 shows that the E/P, B/P sort identifies expected earnings outcomes that are at risk. It is constructed in the same way as Tables 1 and 2, but now reports, in Panels A and B, the standard deviation and the interdecile range (IDR) of *realized* earnings one year ahead (relative to price) for the portfolios. Panels C and D report the same statistics for realized earnings growth rates two years ahead. The IDR, the 90^{th} percentile minus the 10^{th} percentile of realizations, focuses on extreme (tail) realizations. Both the standard deviation and IDR are calculated from the time series of earnings outcomes for portfolios over the sample period.

There is some variation in the volatility of earnings outcomes across E/P portfolios (across the top row in the panels), due mainly to significantly high volatility in the negative E/P portfolio, portfolio 1. However, to the main issue, both the standard deviation and IDR increase over B/P (down columns) for a given E/P: A higher B/P indicates that one is buying riskier

forward earnings and subsequent earnings growth. This is so for all levels of E/P, including high E/P ("value") and low E/P ("growth"). It also is so for negative E/P (loss firms).[15]

To connect the variance of growth rates to that of stock returns, we calculated the correlation between the standard deviation of earnings growth rates for the B/P portfolios (down columns in Panel C) with the standard deviation of returns for these portfolios. These correlations are reported at the bottom of Panel C. It is clear that the variance of realized returns is associated with the variance of realized growth rates. The correlation across the whole spread on E/P, B/P portfolios is 0.74.

To summarize, not only does B/P indicate expected growth (in Table 2) but also the variance around that expectation. The interdecile range is particularly pertinent, for it captures outcomes in the extremes and those are outcomes which the investor is most concerned: B/P indicates a higher chance of a high-growth outcome but also a higher chance of growth falling in the lower tail.

In asset pricing, risk is priced only if it pertains to sensitivity to common risk factors that cannot be diversified away. So, risk to earnings is associated with shocks to market-wide earnings. Accordingly, Table 4 reports earnings betas from estimating the following regression for each portfolio:

$$\text{Portfolio}\,\frac{Earnings_1}{P_0}(t) = \alpha + \beta.\text{Market - wide}\,\frac{Earnings_1}{P_0}(t) + \varepsilon_t$$

The regression is estimated in time series over all years, t, in the sample period. The earnings realizations are for the forward year, that is, the same year during which portfolio returns are observed in Table 1, so the betas are those actually experienced during the holding period, not

historical betas. To align realizations in calendar time, the regression is estimated for firms with December 31 fiscal-years only. The portfolio earnings yield is the mean for the portfolio in a given year and the market-wide earnings yield is the aggregate earnings for all firms in the sample in that year, relative to aggregate price at the beginning of the period.[16]

The betas in Panel A of Table 4 are increasing in B/P for a given E/P portfolio. The average R-square for the regressions is 62.4%: Market-wide earnings explain a significant part of portfolio earnings. Separating years in which the market-wide earnings yield was up from the previous year (up-markets) from years when it was down (down-markets), the conditional betas in Panels B and C indicate that higher B/P have higher up-market betas, delivering higher earnings in good times, but also have higher down-market betas. Higher upside potential comes with downside risk. Correspondingly, low B/P portfolios have considerably lower betas in down-markets, but their upside beta is also lower. In sum, the variation in earnings outcomes across B/P portfolios in Tables 3 is due, in part, to economy-wide shocks.[17]

In summary, the empirical analysis in Tables 1 - 4 and the accounting discussion in section 3 indicate that "value" buys risky growth. These results are quite robust across sub-periods, including years that exclude those during the recent financial crisis.

The pieces are now in place to interpret the return spread in Table 1.

5. Explaining the Returns to E/P and B/P

The returns in Table1are generated by sorting firms first on E/P and then, within E/P portfolios, on B/P. The E/P in Table 1 is the trailing E/P, as in most E/P screens. With equation (1) in mind, the trailing earnings (purged of one-time extraordinary and special items) can be viewed as a

forecast of the forward earnings in equation (1) (which, of course, are not observable).[18] The results in the table pose two questions:

1. Why are returns increasing in E/P when E/P is positive?
2. Why, for a given E/P, are returns increasing in B/P?

The answer to the first question is immediate. By equation (1a), E/P is increasing in the required return, so a sort on E/P (across rows) is likely to pick up the required return and the corresponding average realized returns. Indeed, when $g = 0$ in equation (1a), $r = \frac{Earnings_1}{P_0}$. However, E/P is clearly not a clean measure of risk and return for equities because E/P is also affected by expected earnings growth. E/P = $r - g$, by equation (1a), so something must be added to assess the extent to which a given E/P indicates the required return or growth, or both. That "something" is B/P, applied in the second sort in Table 1.

The answer to the second question is supplied by the B/P equation (2) combined with the accounting principle for recognizing earnings under uncertainty. The sort on B/P (within E/P portfolios) holds E/P constant and thus holds $r - g$ constant for positive E/P, by equation (1a). However, the sort on B/P is also a sort on g. The only way $r - g$ can be constant as g increases is for r also to increase. But r increases only if buying growth is risky. The accounting principle for recognizing earnings under uncertainty suggest so, and Tables 2 – 4 confirm. There is no necessity that accounting principles capture priced risk, of course, but Table 1 suggests so: for a given $r - g$, B/P ranks average returns, and differential average returns are deemed to be reward for risk.[19] The Appendix adds more texture.

One might suggest that the return spreads in Table 1 are just too large to be explained by risk. But the period covered, 1963-2012, was one of significant corporate earnings growth and a bull market in stocks. Buying growth is risky, but in this happy period, the bet paid off handsomely. It was, after all, "The American Century." The returns in Table 1 could, in part, be alpha, but the analysis stresses *caveat emptor*: An investor pursuing alpha from "value" versus "growth" investing might well be aware of the risk involved.

6. Labeling Value and Growth

The analysis here challenges the standard labels, "value" versus "growth." Truth in advertising would demand that "growth" indicates higher expected earnings growth. That is so with the E/P ratio, as Table 2 indicates, but not necessarily so for a B/P ratio.

Equation (2) indicates that, for a given ROE_1 and required return, B/P is decreasing in expected growth, as often presumed: a low B/P indicates growth. But ROE_1 and the required return also enter the equation. Indeed, Panel A of Table 2 shows that low B/P firms in the upper right-hand quadrant have high *ROE.* Those same firms have low growth rates in the upper right-hand quadrant of Panel B of that table. In contrast, high B/P firms that have low ROE have high growth rates.

The confusion in labeling increases when it is said that "growth" yields lower returns, a common attribution. That seems odd, on the face of it, as one typically sees growth as risky, requiring a higher return. This paper connects growth to risk and shows that higher growth and risk are associated with a higher B/P. And it shows that the growth so identified yields higher returns, not lower returns.

Labeling presumably is supposed to convey meaning. The labels, “value” and “growth” confound.

7. Conclusion

This paper exposes a value trap: in buying firms with low multiples, the investor may be taking on risk of buying earnings growth that may not materialize. A relatively high E/P stock, a so-called “value” stock, is typically viewed as one with low growth expectations but in fact can be one with high growth expectations but growth that is risky. High B/P, also a “value” stock, is also associated with risky growth, and the combination of a high E/P and a high B/P more so. That combination yields a higher average return, but the higher expected return comes with risk that expected earnings growth will not be realized.

Value investors screen on high E/P and B/P with the idea that low prices relative to earnings and book value indicate mispricing. But the analysis here provides a warning: buying “value” may be buying risky earnings growth.

Appendix. Further Calibration with the Fed Model as a Benchmark

The paper centers around the notion that buying growth may be risky and that has bearing on buying "value" versus "growth." The point is reinforced when one recognizes the realization principle of accounting that induces risky earnings growth.

The connection of risk to growth is demonstrated in the extreme case where all expected growth is risky. The required return is the risk-free rate, r_f, plus a risk premium, r_p: $r = r_f + r_p$. Suppose that added growth expectations just add to the risk premium because they are deemed to be risk; for added growth, the investor adds to the required return, one-to-one. Then, $r_p = g$ and $r - g = r_f$ such that $\frac{Earnings_1}{P_0} = r_f$. In this case, r_p and g cancel in equation (1a); the market anticipates the growth but also discounts the expected growth for the risk, to leave price unchanged. Curiously, the average forward historical P/E ratio for the S&P 500 at each December 31 from 1988-2012 is 19.7, implying an E/P of 5.1% which is close to the average 10-year U.S. Treasury yield of 5.3% for the period. In Panel C of Table 1 (covering 1963-2012), the median E/P (in E/P portfolio 3) is 5.6%, a little less than the average Treasury yield since 1962 of 6.6%.

This extreme case is, of course, the Fed Model. Ohlson (2008) constructs a hypothetical accounting system—permanent income accounting—that captures this benchmark case where risky growth adds no value. But U.S. GAAP is of a different design and the standard view that anticipated growth adds value presumably has substance, at least for some, and maybe many, firms. Indeed, the other extreme where growth adds to price with no effect on the required return

is the more common view: P/E just reflects expected growth. The spread over E/P and B/P in the table entertain all cases.

The results for E/P portfolio 3 in Table 1 provide a benchmark. Here, the median E/P ratio of 5.6 % (in the top row in Panel C) approximates the average 10-year risk free rate since 1962 of 6.6%. These stocks look like they are priced (approximately) according to the Fed Model where $r - g = r_f$ (and thus E/P = r_f, as earlier). If they were bonds (whose yield is often a benchmark to evaluate the pricing of stocks with the Fed Model), $g = 0$ and this level of E/P would indicate an expected return of 5.6%, by equation (1a). However, stocks can have growth, so the 5.6% represents $r - g$. Thus, the average return for this E/P portfolio is 13.9% (in Panel A of Table 1), implying a risk premium over the risk free rate, but with the risk premium and growth rate canceling such that $r - g = 13.9\% - 8.3\% = 5.6\% = r_f$ (approximately).

For this central E/P portfolio, portfolio 3, $r - g = r_f$ is constant over all portfolios down that column in Table 1. The $r - g$ could be low r with low g or high r with high g, but with $r - g$ always equal to r_f. B/P that ranks these portfolios sorts this out, so that the high B/P portfolio 5 has a higher average return of 18.8% than the 11.8% return in portfolio 3 but also has both higher growth and riskier growth in Tables 2 – 4. It thus requires a higher r.

The median B/P portfolio 3 (for E/P portfolio 3) is the "average" case and, indeed, the portfolio reports an average return of 11.8% in Panel A of Table 1 and an average *ROE* of also about 11.6% in Panel A of Table 2. These returns are approximately the average stock returns and average historical book rate of return that are typically reported for equities. Setting $ROE_1 = r$ in equation (2) and setting $r - g = r_f$, B/P = $\frac{r_f}{r}$. Thus, with the average risk-free rate of 6.6%

since 1962 and an $ROE_1 = r = 11.6\%$, B/P = $\frac{6.6\%}{11.6\%} = 0.57$ which is approximately the median B/P of 0.58 in our sample (that begins in 1963) and also close to the mean B/P of 0.62 in the central E/P portfolio 3 in Panel D of Table 1.[20] The numbers line up quite nicely. In this central cell of the Table 1 spread, stocks are priced according to the Fed Model: at the core, growth and risk cancel which is what one might expect on average. But, moving away from this core across the whole spread of portfolios, growth is priced variably in the cross section, with some growth priced as risky but with some growth adding value. B/P sorts it out. As an aside, this discussion shows that the application of the Fed Model involves some important subtleties.[21]

A value investor might be more interested in the high E/P portfolio 5, but the same logic applies, and the spread between the returns for B/P portfolios 5 and 1 within that portfolio indicates a premium for buying risky growth. A growth investor might buy growth by taking positions in low E/P stocks in portfolios 1 and 2, but might be concerned if the purchased growth is risky. While the average return for these portfolios is not much different from the central E/P portfolio 3, the significant spread across B/P portfolios within the portfolios underlies that concern.

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[1] In addition, La Porta, Lakonishok, Shleifer, and Vishny (1997) report that the value-growth spread over the three days surrounding quarterly earnings announcements accounts for about 30 percent of the annual return spread. Doukas, Kim, and Pantzalis (2002 and 2004) test whether the return spread is due to bias in analysts' earnings forecasts (it is not) and related to risk indicated by higher dispersion of analysts' forecast for value stocks (it is). Piotroski and So (2012) indicate that return differences for value versus growth firms is concentrated in firms where market expectations differ from those indicated by a fundamental scoring metric.

[2] Earnings are before extraordinary items and special items, with an allocation of taxes to special items at the prevailing statutory tax rate for the year. The findings in Table 1 are similar when the return period begins four months after fiscal year and when we eliminate firms with stock prices less than $1.00. For firms that are delisted during the 12 month holding period, we calculate the return for the remaining months by first applying the CRSP delisting return and then reinvesting any remaining proceeds at the risk-free rate. This mitigates concerns about potential survivorship bias. Firms that are delisted for poor performance (delisting codes 500 and 520-584) frequently have missing delisting returns. We apply delisting returns of -100% in such cases, but the results are qualitatively similar when we make no such adjustment.

[3] There are also a small number of loss firms in E/P portfolio 2. Results are similar when we form six E/P portfolios, one with all loss firms, and five from a ranking of firms with positive E/P.

[4] The average returns for five portfolios from ranking on B/P alone (without consideration of E/P) are, in percent, 8.1 (low B/P), 11.8, 14.3, 17.8, and 24.0 (high B/P). As E/P and B/P are positively correlated—the mean rank correlation is 0.31—this return spread can be partially explained by returns to E/P. However, the Table 1 results indicate that, for a given E/P, B/P adds further to returns, and it is this added returns premium that we investigate.

[5] For E/P portfolios 3-5, the returns over B/P portfolios appear to be slightly U-shaped, with returns for the high B/P portfolios (portfolio 1) higher than that those for portfolio 2. However, further tests ascertained that these return differences were not statistically different from zero.

[6] By excluding growth that comes only from retention (with no value added), we accordingly focus on growth that comes from the success of investments. Ohlson and Juettner-Nauroth (2005) develop a pricing model based on expected forward earnings and subsequent earnings growth that generalizes to all payout policies yet is dividend irrelevant.

[7] The point applies to all valuation models that build in a growth rate, whether based on dividends, free cash flow, or earnings. In "terminal value" calculations in these models, the valuation attribute is capitalized at the rate, $r - g$, and r may be related to g.

[8] Under international financial reporting standards (IFRS), "research" is expensed but "development" is capitalized and amortized (IAS No. 38). The distinction is made under the criterion of "probable future economic benefits."

[9] In Equation (1a), earnings growth is at a constant rate, g. However, a constant growth rate is not necessary for the analysis in this paper: view g as a summary of all earnings expected in the future relative to $Earnings_1$.

[10] The effect of conservative accounting on ROE_1 and expected growth is an accounting property—it is simply by the construction of the accounting. This is modeled in Feltham and Ohlson (1995) and Zhang (2000). However these papers model the accounting effects assuming no effect on risk and the required return.

[11] Penman and Zhang (2014) develop a measure of the effect of conservative accounting on *ROE* and document empirically how this measure affects *ROE*.

[12] See press reports in *The Wall Street Journal*, October 25, 2013, p. B3 and *Financial Times* of the same date, p. 13. *The Wall Street Journal* also reported (p. C1) a study by Morgan Stanley that 89 percent of a present value calculation on Amazon related to cash flow forecasted for years after 2020.

[13] Penman (2012, Chapter 5) lays out the Starbucks case in more detail.

[14] The mean growth rates are means over years of median growth rates for portfolios in each year. Because added investment from retention in the first year ahead adds to earnings growth two years ahead, we also calculated the residual earnings growth rate two years ahead to subtract for the added investment. Residual earnings was calculated as earnings with a charge against beginning-of-period book value at the prevailing yield on the ten-year U.S government note. Results were similar.

[15] Two-year-ahead growth is not sufficient to document ex post growth over the long term. However, firms disappear over time so extension of the analysis to subsequent years faces a serious problem of survivor bias. That, of course, raises the question as to whether the results are affected by such bias, for firms do disappear within two years. The returns in Table 1 include delisting returns, but there is no accommodation for the growth findings here. So we ascertained the fraction of firms that ceased to exist in the second year for performance-related reasons indicated by CRSP delisting codes. The delisting rate was higher for high B/P firms, an average of 8.9 percent over all high B/P portfolios in the first year ahead versus 7.7 percent for low B/P portfolios. The corresponding delisting rates over the next two years were 20.8 percent versus and 16.9 percent. This reinforces our inferences rather than qualifying them: delisted firms are those that either had low payoffs with firm failure or high payoffs in being acquired.

[16] For the E/P, B/P portfolios, means are arithmetic means. Similar results were obtained with weighted means, that is, with portfolio earnings calculated as the total earnings for the portfolio relative to price. The market earnings are total earnings for all firms relative to price.

[17] The earnings betas here are consistent with Cohen, Polk, and Vuolteenaho (2009) and Campbell, Polk, and Vuolteenaho (2010) who attribute the higher returns to value stocks to higher "cash flow betas," that is, the sensitivity to news about future cash flows.

[18] The mean rank correlation between trailing earnings-to-price and realized forward earnings-to-price is 0.63. Of course, equation (1) can also be expressed in terms of trailing earnings, $Earnings_0$, with earnings growth, g, forecasted from the current year onwards rather than after the forward year. This recasts the analysis as investing on the basis of trailing E/P and B/P, with no loss of insight.

[19] Equations (1a) and (2) are predicated on positive earnings. So the math underlying our analysis applies only to positive E/P ratios. However, negative earnings (and thus negative *ROE*) can be case where the earnings is (severely) reduced because of earnings deferral—the case of a firm reporting losses because of expensing of R&D, but with positive earnings expected from the R&D in the future, is an example. The math aside, the accounting logic thus applies to loss firms also and the pattern of returns over B/P for the negative E/P portfolio (portfolio 1) is similar to that for other portfolios, indeed more so. As indicated earlier, results are similar when we put all loss firms in one portfolio.

[20] In a model where growth and risk cancel and the Fed Model applies, Ohlson (2008) shows that $ROE_1 = r$, as in the calibration here.

[21] The Fed model has been the subject of considerable debate. See Lander, Orphanides, and Douvogiannis (1997), Asness (2003), Salomons (2006), Estrada (2007), and Thomas and Zhang (2007), for example.

Table 1. Mean Annual Returns for Portfolios Formed by Ranking Firms Each Year on E/P and B/P, along with E/P and B/P for the Portfolios; 1963-2012

The table present average returns over years for portfolios formed by ranking firms each year on E/P and then, within each E/P portfolio, by ranking on B/P. Panel A reports equally-weighted portfolio returns and Panel B value-weighted returns. Panels C and D report mean E/P and B/P for the portfolios. *t*-statistics are tests for significant differences between the means for *High* and *Low* portfolios.

A. Mean Returns (in Percent) for Equally-weighted Portfolios

		Low	***2***	***3***	***4***	***High***	***H-L***	***t-stat***
Ranking on EP alone		14.1	10.1	13.9	16.4	22.5	8.4	*2.18*
				EP				
		Low	***2***	***3***	***4***	***High***		
BP	***Low***	2.2	6.3	14.2	15.8	19.5		
	2	8.6	6.6	11.0	14.6	19.3		
	3	12.7	6.7	11.8	13.3	21.6		
	4	18.0	11.7	12.7	16.6	23.1		
	High	28.2	19.1	18.8	21.4	28.8		
	H-L	26.0	12.8	4.6	5.6	9.3		
	t-stat	*5.47*	*3.80*	*2.07*	*3.00*	*3.90*		

B. Mean Returns (in Percent) for Value-weighted Portfolios

		Low	***2***	***3***	***4***	***High***	***H-L***	***t-stat***
Ranking on EP alone		9.8	7.9	9.5	12.5	15.8	6.0	*1.53*
				EP				
		Low	***2***	***3***	***4***	***High***		
BP	***Low***	4.1	6.7	10.5	12.5	14.9		
	2	9.6	6.2	9.9	11.7	15.0		
	3	4.2	8.5	8.6	11.5	16.4		
	4	12.7	9.0	7.3	13.9	17.3		
	High	18.3	13.6	10.7	16.4	22.1		
	H-L	14.3	6.9	0.2	3.9	7.2		
	t-stat	*3.50*	*2.04*	*0.08*	*1.77*	*2.11*		

C. Mean E/P (in Percent)

	Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone	-17.5	1.3	5.6	8.3	12.3	29.8

		EP				
		Low	*2*	*3*	*4*	*High*
BP	*Low*	-13.4	1.0	5.4	8.0	11.7
	2	-14.6	1.5	5.7	8.2	11.8
	3	-17.0	1.5	5.7	8.3	12.1
	4	-19.1	1.4	5.7	8.4	12.7
	High	-24.1	1.1	5.6	8.4	13.4
	H-L	-10.7	0.1	0.2	0.4	1.7

D. Mean B/P

	Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone	0.93	0.59	0.62	0.74	1.04	0.11

		EP				
		Low	*2*	*3*	*4*	*High*
BP	*Low*	0.13	0.16	0.25	0.36	0.48
	2	0.34	0.29	0.39	0.53	0.73
	3	0.63	0.45	0.51	0.67	0.91
	4	1.10	0.69	0.70	0.84	1.14
	High	2.44	1.40	1.27	1.37	1.96
	H-L	2.31	1.24	1.02	1.01	1.48

Table 2. Mean Return on Equity (*ROE*) and Earnings Growth Rates Two Years Ahead for Portfolios Formed by Ranking Firms Each Year on E/P and B/P, 1963-2012

Panel A reports mean *ROE* for the E/P, B/P portfolios in Table 1and Panel B reports mean earnings growth rates two years ahead for the same portfolios. Earnings growth rates are calculated as $\frac{Earnings_{t+2} - Earnings_{t+1}}{(|Earnings_{t+2}| + |Earnings_{t+1}|)/2}$. This growth rate accommodates small and negative denominators, and ranges between 2 and -2.

A. Mean Return on Equity (*ROE*), in Percent

	Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone	-16.4	1.8	12.2	13.2	12.0	28.4

		EP				
		Low	*2*	*3*	*4*	*High*
BP	*Low*	-29.0	0.3	23.3	22.6	20.4
	2	-20.3	3.2	16.0	15.9	14.6
	3	-15.5	2.7	11.6	12.5	11.9
	4	-12.4	2.1	8.0	9.8	9.0
	High	-12.5	-0.4	3.1	5.0	4.5
	H-L	16.5	-0.7	-20.2	-17.6	-15.9

B. Mean Earnings Growth Rates Two Years Ahead, in Percent

	Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone	30.3	13.2	10.4	7.6	3.4	-26.9

		EP				
		Low	*2*	*3*	*4*	*High*
BP	*Low*	18.9	7.1	10.8	6.6	0.6
	2	27.8	7.9	8.2	7.2	2.4
	3	28.0	11.8	9.3	7.6	3.1
	4	36.7	15.4	5.6	8.0	3.0
	High	48.5	29.1	18.2	10.6	4.6
	H-L	29.6	22.0	7.4	4.0	4.0

Table 3. Standard Deviation and Interdecile Range (IDR) of Realized Earnings-to-Price One Year Ahead and Realized Earnings Growth Rates Two Years Ahead for Portfolios Formed by Ranking Firms on E/P and B/P; 1963-2012

The table documents the fundamental risk that the investor faces in investing in the E/P, B/P portfolios in Table 1. Panels A and B report the standard deviation and interdecile range of portfolio earnings one year ahead (relative to the current price), calculated from the time series of portfolio earnings over the sample period. Panels C and D report the same statistics for earnings growth rates two years ahead, with earnings growth rates calculated as in Table 2.

A. Standard Deviation of Portfolio *Earnings$_1$/P$_0$* (%)

	Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone	13.9	5.1	3.8	4.2	6.3	-7.6

		EP				
		Low	*2*	*3*	*4*	*High*
BP	*Low*	8.8	4.3	3.3	3.7	4.8
	2	9.7	4.4	3.4	4.0	4.8
	3	11.5	4.7	3.6	4.0	4.9
	4	13.4	5.2	3.9	4.5	5.7
	High	33.5	6.9	5.4	5.3	15.2
	H-L	24.7	2.6	2.1	1.6	10.4

B. Interdecile Range (IDR) of Portfolio *Earnings$_1$/P$_0$* (%)

	Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone	34.4	13.0	10.4	10.8	14.6	-19.8

		EP				
		Low	*2*	*3*	*4*	*High*
BP	*Low*	22.0	11.0	9.4	10.3	13.5
	2	23.4	11.0	9.2	11.0	13.2
	3	30.7	13.0	10.3	10.3	12.9
	4	32.5	13.5	11.2	11.7	16.2
	High	91.3	17.5	14.1	12.3	20.1
	H-L	69.3	6.5	4.7	2.0	6.6

C. Standard Deviation of Earnings Growth Rates Two Years Ahead %

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone		18.8	17.7	14.3	11.9	13.8	-5.0
				EP			
		Low	*2*	*3*	*4*	*High*	
BP	*Low*	19.3	15.4	12.9	11.8	14.4	
	2	25.8	18.7	14.7	12.8	13.5	
	3	22.4	19.2	13.6	12.5	17.5	
	4	25.3	21.6	25.0	12.5	18.0	
	High	26.7	33.1	23.2	22.9	24.1	
	H-L	7.4	17.7	10.3	11.1	9.7	
Corr with return standard deviation		0.84	0.44	0.57	0.76	0.98	

D. Interdecile Range (IDR) of Earnings Growth Rates Two Years Ahead %

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on EP alone		45.4	48.5	37.1	33.4	38.0	-7.4
				EP			
		Low	*2*	*3*	*4*	*High*	
BP	*Low*	49.7	35.5	33.9	32.0	42.0	
	2	54.7	49.8	35.4	32.9	33.7	
	3	58.7	47.1	39.0	35.3	54.9	
	4	64.2	58.4	46.8	34.3	43.9	
	High	76.4	76.2	59.4	61.4	65.1	
	H-L	26.7	40.7	25.5	29.4	23.1	

Table 4. Unconditional Earnings Betas and Up-market and Down-market Earnings Betas for Portfolios Formed by Ranking Firms on E/P and B/P; 1963-2012

The table reports earnings betas from regressing realized portfolio earnings yields on the aggregate market earnings yield. Panel A reports these betas over all conditions and Panels B and C report the betas in up-markets and down-markets respectively.

A. Unconditional Betas

		EP				
		Low	***2***	***3***	***4***	***High***
BP	***Low***	1.56	0.85	0.72	0.78	1.05
	2	1.87	0.91	0.72	0.86	1.08
	3	2.05	0.97	0.78	0.82	0.86
	4	1.81	1.06	0.80	0.98	1.29
	High	4.47	1.37	1.13	1.06	2.28
	H-L	2.91	0.53	0.40	0.28	1.23

B. Up-market Betas

		EP				
		Low	***2***	***3***	***4***	***High***
BP	***Low***	1.19	0.87	0.81	0.91	1.34
	2	1.60	0.99	0.82	0.99	1.27
	3	1.45	1.00	0.90	0.94	1.04
	4	1.32	1.10	0.90	1.09	1.50
	High	2.57	1.20	1.10	1.01	1.39
	H-L	1.38	0.33	0.28	0.09	0.05

C. Down-market Betas

		EP				
		Low	***2***	***3***	***4***	***High***
BP	***Low***	1.50	0.68	0.51	0.45	0.69
	2	1.76	0.66	0.53	0.64	0.87
	3	2.11	0.75	0.51	0.55	0.71
	4	1.84	0.69	0.51	0.75	0.98
	High	4.97	1.09	0.77	0.80	2.79
	H-L	3.46	0.40	0.26	0.35	2.10